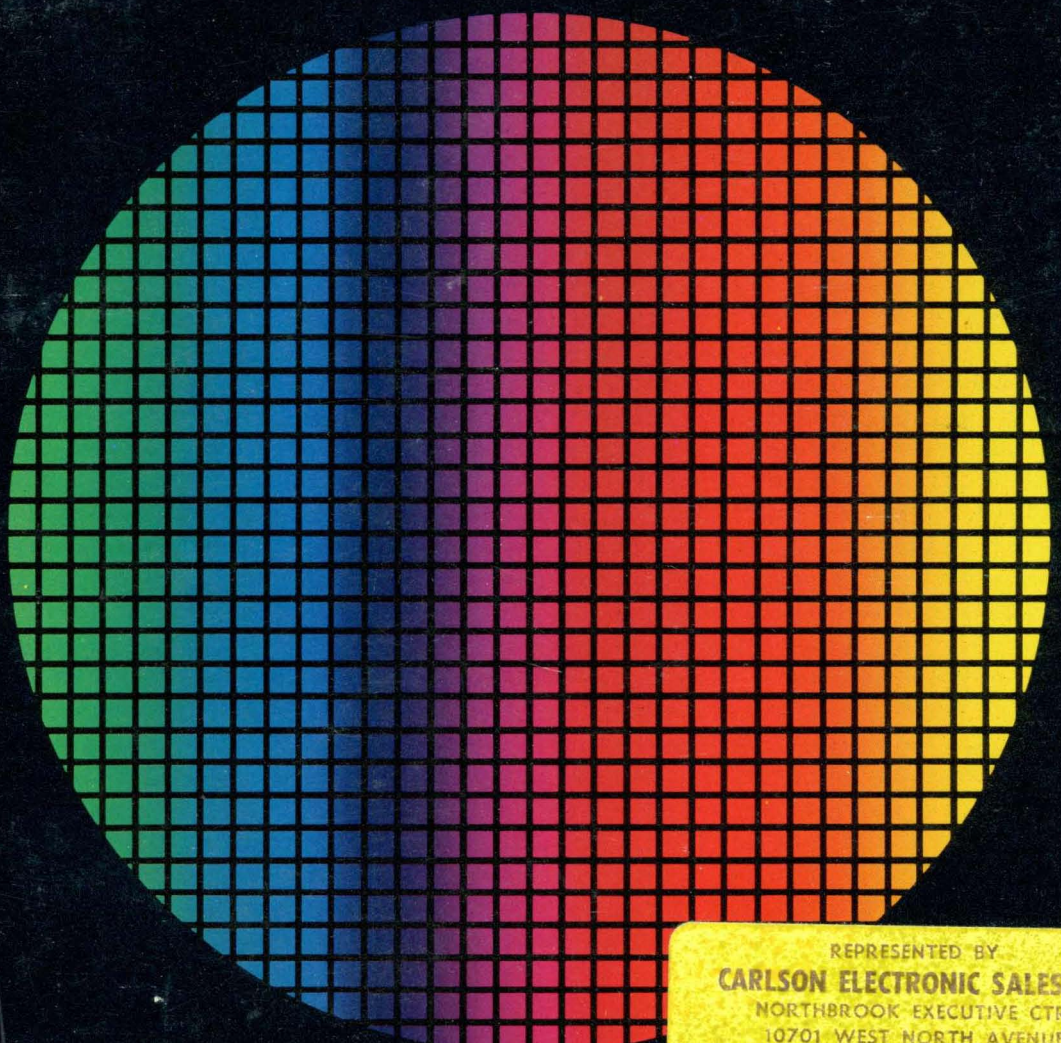
RAYTHEON

MASTER PRODUCT SELECTION GUIDE 1982



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Introduction

This selection guide is a full line condensed catalog. It is designed to be used as a quick reference source on all Raytheon semiconductor products. Each product category has been placed in a separate section:

- Linear
- Bipolar Memory Products
- Digital
- Small Signal Transistors

Each section contains a brief product description, key electrical specifications and available package types for each device. If you need more detailed information, or would like a quotation on one or more devices, please contact one of the Raytheon Field Sales Offices or Representatives.

Reliability

Reliability and quality are always a major concern in both the military and the commercial/industrial market. For that reason, Raytheon offers its customers an alternative to the high priced military processing. Raytheon's A+ program is designed to provide the industrial and commercial marketplace with product reliability. ■ Reliability consistent with application requirements. ■ Reliability that avoids an overbuy situation where the user pays for screening beyond the scope of his needs.

Raytheon offers three screening flows under the A+ program: each having a separate factor and cost savings. When deciding which A+ flow best suits your needs, you should consider the cost savings realized through elimination of outside test lab services and the need to tighten incoming inspection. Users who do not presently have their own integrated circuits screened should consider the cost of component replacement during system test and in the field. Substantial cost savings can be realized by specifying Raytheon's A+ program.

Raytheon also offers full military processing. Official certification has been granted Raytheon, allowing us to qualify and supply Class B and Class C linear, microcircuits in accordance with the requirements of MIL-M-38510. Combined with our current strong JAN, JANTX, and JANTXV transistor products, this supports a high reliability commitment of out customers.

Ordering Information

Package Descriptions

CJ 14-Pin Ceramic Flatpak
CL 16-Pin Ceramic Flatpak
CK 14-Pin Ceramic Flatpak
CQ 10-Pin Ceramic Flatpak
D 14, 16, 18, 20, 24 or 40-Pin DIP
DB 14-Pin Plastic DIP
DC 14-Pin Ceramic DIP
DD 16-Pin Ceramic DIP
DE 8-Pin Ceramic DIP
DQ 18-Pin Ceramic DIP
DR 24-Pin Ceramic DIP
DS 20-Pin Ceramic DIP
DV 28-Pin Ceramic DIP
DZ 40-Pin Ceramic DIP
F Flatpak
G 14-Pin Metal Flatpak
H 3, 8 or 10-Pin Metal Can
J 14, 16 or 24-Pin Metal DIP
LV 28-Pin Square Leadless Chip Carrier
LW 28-Pin Rectangular Leadless Chip Carrier
M 8, 14-Pin Micro Package
MB 16-Pin Plastic DIP
MV 28-Pin Plastic DIP
MZ 40-Pin Plastic DIP
MC 14-Pin Ceramic Side-Brazed DIP
ML 16-Pin Ceramic Side-Brazed DIP
MQ 18-Pin Ceramic Side-Brazed DIP
MS 20-Pin Ceramic Side-Brazed DIP
MU 24-Pin Ceramic Side-Brazed DIP (600mil)
MT 24-Pin Ceramic Side-Brazed DIP (300mil)
MW 24-Pin Ceramic Side-Brazed DIP (600mil)
MY 24-Pin Ceramic Side-Brazed DIP (300mil)
N Plastic DIP
NB 8-Pin Plastic DIP
P Plastic DIP
PU 24-Pin Plastic DIP
PV 28-Pin Plastic DIP
PZ 40-Pin Plastic DIP
R 24-Pin Ceramic DIP
T 3, 8, 10 or 12-Pin Metal Can
TK 9-Pin TO-66 Power Pack
W 14, 16 or 24-Pin Ceramic Flatpak

Linear Circuits

Raytheon Series

RC 4151 DE /883B

Temperature Range
RC 0 to +70°C
RM -55 to +125°C
RV -40 to +85°C

Basic Part Type

Package Type

Optional Processing to MIL-STD-883, Level B

XR Series

XR 2207 CN

Prefix

Basic Part Type

Package and Temperature Range
M Ceramic -55 to +125°C
N Ceramic -40 to +85°C
P Plastic -40 to +85°C
CN Ceramic 0 to +75°C
CP Plastic 0 to +75°C

HA Series

HA 1 4741 2

Prefix

Package Type
1 14-pin Ceramic DIP
3 14-pin Plastic DIP

Basic Part Type

Temperature Range
2 -55 to +125°C
5 0 to +70°C
8 -55 to +125°C
(MIL-STD-883, Level B)

LM Series

LM 108 H /883B

Prefix

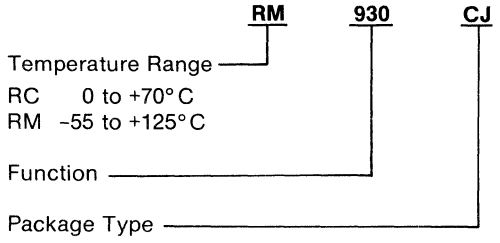
Basic Part Type

Package Type

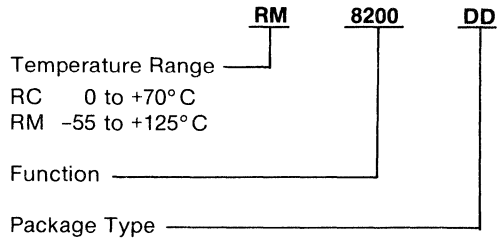
Optional Processing to MIL-STD-883, Level B

Digital

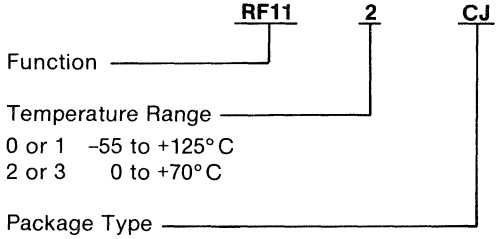
930 DTL Series



8200 MSI Series



Ray I, and Ray II TTI Series



Beam Lead Chips and SURE™ Products

Diode and Transistors

Prefix	Device	Suffix
BD	458A	C

BD Diode; 2 anode beams, 2 cathode beams
B2D Diode; 1 anode beam, 1 cathode beam, 2 beams mechanical support only
BZ Zener diode
BT Transistor

Blank B-level (military) visual
C C-level (commercial) visual
T B-level visual chip in TO-18 can TO-18 can

Integrated Circuits

Prefix	Device	Suffix
RM	1741	BL

RC 0 to +70°C, C-level (commercial) visual
RM -55 to +125°C, B-level (military) visual
RF Ray I, II, III TTL device,
RG -55 to +125°C,
RL B-level visual
54LS Low-Power Schottky TTL, -55 to +125°C, B-level visual

Beam Lead Chip

Dual and Quad Transistors

Prefix	Device	Suffix
SP	2222A	QD

Dual or Quad
Device Type

F 6-Pin, Glass/metal, Dual Flatpak (TO-89)
QF 14-Pin, Glass/Metal, Quad Flatpak (TO-86)
QD 14-Pin, Glass/Metal, Quad, DIP (TO-116)

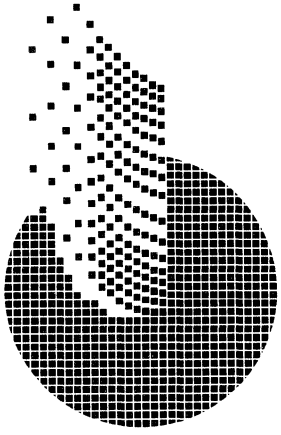
LSI Memory Components

Suffix	Example	
DC	29683DMB	Hermetic DIP
DM		Military temp. range
DMB		Processed to 883B
FM		
FMB		
LV		
LW		
SC		
SM		
SMB		

Process to MIL-M-883B

Package Type
D = Hermetic DIP
F = Flatpak
L = Leadless Chip Carrier
S = Slim DIP

Temperature Range
C = 0 to +75°C
M = -55 to +125°C



SECTION 1
LINEAR

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Linear Cross Reference Guide

Raytheon	PMI	Fairchild	AMD	Motorola	National	RCA	Signetics	T.I.
DAC-08A[1] DAC-08C DAC-08E HA1-4741-2[1] HA3-4741-5	DAC-08A DAC-08C DAC-08E	μA0801A μA0801C μA0801E	DAC-08A DAC-08C DAC-08E	DAC-08A DAC-08C DAC-08E MC4741 MC4741	DAC-0800A DAC-0800C DAC-0800E		SE5009 NE5007 NE5008	
LH2101A[1] LH2111[1] LM101A[1] LM111[1] LM124[1]		 μA101A μA111 μA124	LH2101A LM101A LM111 LM124	 MLM101A MLM111 MLM124	LH2101A LH2111 LM101A LM111 LM124	 CA101A CA111 CA124	LH2101A LM101A LM111 LM124	 LM124
LM13600A LM13600 LM139[1] LM146[1] LM148[1]	PM139	 μA139 μA148	 LM139 LM148	 MLM139	LM13600A LM13600 LM139 LM146 LM148	 CA3080[2] CA139	 LM139	 LM139
LM301A LM311 LM311 LM324 LM339	 PM339	μA301A μA311 μA311 μA324 μA339	LM301A LM311 LM311 LM324 LM339	MLM301A MLM311 MLM311 MLM324 MLM339	LM301A LM311 LM311 LM324 LM339	CA301A CA311 CA324 CA339	LM301A LM311 LM311 LM324 LM339	LM301A LM311 LM324 LM339
LM346 LM348 LM348 LM2900 LM2901		 μA348 μA348 μA2900 μA2901	 LM348 LM348	 MLM2901	LM346 LM348 LM348 LM2900 LM2901	 	 LM2901	 LM348 LM348 LM2901
LM2902 LM3900 RC714 RC714C RC714E		μA2902 μA3900 μA714 μA714C μA714E		MLM2902	LM2902 LM3900		SA534	LM2902 LM3900
RC714L RC1458 RM3078[1] RC3078 RC3301	 OP-14	μA714L μA1458 μA3301		 MC1458 MC1776[2] MC3301	 LM1458 LM3301	 CA1468 CA3078 CA3078	 MC1458	 MC1458
RC3302 RC3401 RC3403A RM4131[1] RC4131		μA3302 μA3401 μA3403		MC3302 MC3401 MC3403 MC1556[2] MC1456[2]	LM3302 LM3401	CA3302 CA3401	MC3302	 MC3403
RC4136 RC4151 RC4152 RC4153 RC4156	OP-09	μA4136 μA4151 μA348[2]		 MC4741[2]	 LM331[2] LM331[2] LM348[2]	 	 	RC4136 LM348[2]
RC4157 RC4194 RC4195 RC4200 RC4444		μA348[2]		MC4741[2] MC1468[2] MC1468[2] MC3416	LM348[2] LM125[2]		 NE554[2] NE554[2]	LM348[2]

Notes: 1. Also available processed to MIL-STD-883
2. Functional Equivalent

Linear Cross Reference Guide (Cont'd)

Raytheon	PMI	Fairchild	AMD	Motorola	National	RCA	Signetics	T.I.
RC4531							NE531	
RC4558		μA4558		MC4558				RC4558
RM4558[1]								
RC4559		μA4558[2]		MC4558[2]				RC4558[2]
RC4739		μA739[2]		MC1303	MC1303			
RC5532A							NE5532A	
RC5532							NE5532	
RC5534A							NE5534A	NE5534A
RC5534							NE5534	NE5534
RC555		μA555		MC1555	LM555		NE555	NE555
RM555[1]					LM555		SE555	
RC556		μA556		MC3556	LM556		NE556	NE556
RM556[1]		μA556		MC3556	LM556		SE556	
RC723		μA723		MC1723	LM723		μA723	
RM723[1]		μA723	723	MC1723	LM723	CA723	μA723	
RC725	OP-06	μA725			LM725			
RM725[1]		μA725			LM725			
RC741	OP-02	μA741			LM741		μA741	μA741
RM741[1]		μA741		MC1741	LM741	CA741	μA741	
RC747	OP-04	μA747			LM747	CA747	μA747	
RM747[1]		μA747		MC747	LM747	CA747	μA747	μA747
RM1558[1]	OP-14	μA1558		MC1558	LM1558	CA1558	MC1558	
RM3503A[1]		μA3503		MC3503				MC3503
RM4136[1]	OP-09	μA4136						RM4136
RM4531[1]							SE531	
XR2207								
XR2207[1]								
XR2211								
XR2211[1]								

Raytheon	PMI	Fairchild	μPower	Analog Devices				
OP-07	OP-07	μA714	MP5507	ADOP-07				
OP-07A	OP-07A	μA714A	MP5507A	ADOP-07A				
OP-07C	OP-07C	μA714C	MP5507C	ADOP-07C				
OP-07D	OP-07D	μA714D	MP5507D	ADOP-07D				
OP-07E	OP-07E	μA714E	MP5507E	ADOP-07E				
OP-27A	OP-27A							
OP-27B	OP-27B							
OP-27C	OP-27C							
OP-27E	OP-27E							
OP-27F	OP-27F							
OP-27G	OP-27G							
OP-37A	OP-37A							
OP-37B	OP-37B							
OP-37C	OP-37C							
OP-37E	OP-37E							
OP-37F	OP-37F							
OP-37G	OP-37G							

Notes: 1. Also available processed to MIL-STD-883
2. Functional Equivalent

High Performance Operational Amplifiers

Device	Descprition	Maximum Input Specifications			Typical Input Noise Specifications				Typ. Slew Rate ($V/\mu S$)	Typ. Unity Gain BW (MHz)	Max. Sply Volt. (±V)	Pins	Temp Range
		Offset Volt. (mV)	Offset Cur. (nA)	Bias Cur. (nA)	Volt. Density $\left[\frac{nV}{\sqrt{Hz}}\right]$	Low Freq. Corner e_N (Hz)	Cur. Density $\left[\frac{PA}{\sqrt{Hz}}\right]$	Low Freq. Corner i_N (Hz)					
OP-07	Single Ultra Low Offset Voltage	0.075	2.8	±3	10.0	10	0.14	50	0.17	0.6	22	8	M
OP-07A	Single Ultra Low Offset Voltage	0.025	2.0	±2	10.0	10	0.14	50	0.17	0.6	22	8	M
OP-07C	Single Ultra Low Offset Voltage	0.150	6.0	±7	10.2	10	0.15	50	0.17	0.6	22	8	C
OP-07D	Single Ultra Low Offset Voltage	0.150	6.0	±12	10.3	10	0.15	50	0.17	0.6	22	8	C
OP-07E	Single Ultra Low Offset Voltage	0.075	3.8	±4	10.0	10	0.14	50	0.17	0.6	22	8	C
OP-27A	Single Ultra Low Noise	0.025	35	±40	3.0	3.0	0.4	140	2.8	8.0	22	8	M, C
OP-27B	Single Ultra Low Noise	0.060	50	±55	3.0	3.0	0.4	140	2.8	8.0	22	8	M, C
OP-27C	Single Ultra Low Noise	0.100	75	±80	3.2	3.0	0.4	140	2.8	8.0	22	8	M, C
OP-27E	Single Ultra Low Noise	0.025	35	±40	3.0	3.0	0.4	140	2.8	8.0	22	8	M, C
OP-27F	Single Ultra Low Noise	0.060	50	±55	3.0	3.0	0.4	140	2.8	8.0	22	8	M, C
OP-27G	Single Ultra Low Noise	0.100	75	±80	3.2	3.0	0.4	140	2.8	8.0	22	8	M, C
OP-37A*	Single High Slew Rate Low Noise	0.025	35	±40	3.0	3.0	0.4	140	11	63	22	8	M, C
OP-37B*	Single High Slew Rate Low Noise	0.060	50	±55	3.0	3.0	0.4	140	11	63	22	8	M, C
OP-37C*	Single High Slew Rate Low Noise	0.100	75	±80	3.2	3.0	0.4	140	11	63	22	8	M, C
OP-37E*	Single High Slew Rate Low Noise	0.025	35	±40	3.0	3.0	0.4	140	11	63	22	8	M, C
OP-37F*	Single High Slew Rate Low Noise	0.060	50	±55	3.0	3.0	0.4	140	11	63	22	8	M, C
OP-37G*	Single High Slew Rate Low Noise	0.100	75	±80	3.2	3.0	0.4	140	11	63	22	8	M, C
RC714	Single Precision	0.075	2.8	±3	9.6	3.0	0.12	140	0.17	0.5	22	8	C
RC714C	Single Precision	0.150	6.0	±7	9.8	3.0	0.13	140	0.17	0.5	22	8	C
RC714E	Single Precision	0.075	3.8	±4	9.6	3.0	0.12	140	0.17	0.5	22	8	C
RC714L	Single Precision	0.250	20	±30	9.8	3.0	0.13	140	0.17	0.5	22	8	C
RC3078	Single Micropower	4.5	32	170	19.0	100	1.0	200	1.5	0.1	15	8	M,C
RC3078A	Single Micropower	3.5	2.5	12	36.0	100	0.4	200	1.5	0.1	15	8	M,C
RC5534	Single High Performance Low Noise	4.0	300	1500	4.0	100	0.6	200	13.0	10.0	22	8	M,C
RC5534A	Single High Performance Low Noise	4.0	300	1500	3.5	100	0.4	200	13.0	10.0	22	8	M,C
RC2041	Dual High Performance Low Noise	3.0	200	500	5.0	20	0.4	200	3.0	7.0(4.0)	18	8	C
RC2043	Dual High Performance Low Noise	3.0	200	1000	5.0	20	0.4	200	6.0	14(8.0)	18	8	C
RC4560	Dual High Performance	6.0	200	500	10.0	20	0.5	200	4.0	10(7.0)	18	8	C
RC4562	Dual High Performance	6.0	200	500	6.0	20	0.2	200	7.0	15(8.0)	18	8	C
RC4558	Dual High Gain	6.0	200	500	10.0	20	0.5	200	1.0	2.5	18	8	M,C
RC4559	Dual High Performance	6.0	100	250	10.0	20	0.18	200	2(1.5)	4.0(3.0)	18	8	M,C
RC4739	Dual Low Noise	6.0	200	500	10.0	20	0.5	400	1.0	4.0	18	14	M,C
RC5532	Dual High Performance Low Noise	2.0	150	800	5.0	100	0.7	200	8.0	10.0	22	8	M,C
RC5532A	Dual High Performance Low Noise	2.0	150	800	5.0	100	0.7	200	8.0	10.0	22	8	M,C
RC4556	Dual High Performance	6.0	200	500	10.0	20	0.5	200	3.0	8.0(5.0)	18	8	C

Notes: ( ) denotes guaranteed specifications
M = Military/883B -55°C to 125°C
C = Commercial 0°C to 70°C
* = Preliminary specifications

High Performance Operational Amplifiers (Cont'd)

Device	Descprition	Maximum Input Specifications			Typical Input Noise Specifications				Typ. Slew Rate (V/μS)	Typ. Unity Gain BW (MHz)	Max. Sply Volt. (±V)	Pins	Temp Range
		Offset Volt. (mV)	Offset Cur. (nA)	Bias Cur. (nA)	Volt. Density e_N $\frac{nV}{\sqrt{Hz}}$	Low Freq. Corner e_N (Hz)	Cur. Density i_N $\frac{PA}{\sqrt{Hz}}$	Low Freq. Corner i_N (Hz)					
LM146	Quad Low Power Programmable	5.0	20	100	10.0	10	0.2	80	0.4	1.2	22	16	M,C
LM246	Quad Low Power Programmable	5.0	20	100	10.0	10	0.2	80	0.4	1.2	22	16	M,C
LM346	Quad Low Power Programmable	5.0	20	100	10.0	10	0.2	80	0.4	1.2	22	16	M,C
RC4136	Quad 741 General	6.0	200	500	10.0	20	0.2	100	1.5	10.0	18	14	M,C
RC4149	Quad Low Power Programmable	6.0	100	250	10.0	10	0.2	80	2.5	1.0	22	16	M,C
RC4156	Quad High Performance	5.0	50	300	9.0	100	0.1	200	1.6(1.3)	3.5(2.5)	20	14	M,C
RC4157	Quad High Speed Decompensated	5.0	50	300	9.0	—	0.1	—	8(6.5)	19(15)	20	14	M,C
RC4741	Quad General Purpose	3.0	30	200	9.0	80	0.1	250	1.6	3.5	20	14	M,C

Notes: ( ) denotes guaranteed specifications
M = Military/883B -55°C to 125°C
C = Commercial 0°C to 70°C

MIL-M-Qualified Devices

Ordering P/N M38510-	Raytheon Part Number	QPL Status
10101BCB	MM741DCB	I
10101BCC	MM741DCC	I
10101BGC	MM741TEC	I
10101BPC	MM741DEC	I
10102BAB	MM747CJB	I
10102BAC	MM747CJC	I
10102BCB	MM747DCB	I
10102BCC	MM747DCC	I
10102BIC	MM747TFC	I
10103BCB	MM101ADCB	I
10103BCC	MM101ADCC	I
10103BGC	MM101ATEC	I
10103BPC	MM101ADEC	I

Ordering P/N M38510-	Raytheon Part Number	QPL Status
10105BEA	MM2101/ADMA	I
10105BEC	MM2101DMC	I
10304BPC	MM111DEC	II
10305BEC	MM2111DMC	I
11001BCB	MM148DCB	II
11001BCC	MM148DCC	II
11003BCB	MM4156DCB	I
11003BCC	MM4156DCC	I
11004BCB	MM4136DCB	I
11004BCC	MM4136DCC	I
11201BCB	MM139DCB	I
11201BCC	MM139DCC	I

Single Operational Amplifiers

Type	Description	Maximum Input Specifications @ 25°C			Typ[1] Unity Gain BW (MHz)	Typ Slew Rate (V/μS)	Temp[2] Range	Available Packages[4]						
		Offset Voltage (mV)	Offset Current (nA)	Bias Current (nA)				DC	DE	H	M	N	NB	T
LM101A[6]	General purpose with improved input characteristics	2	10	75	1	.5	M		X	X				
LM201A	General purpose with improved input characteristics	2	10	75	1	.5	I		X	X				
LM301A	General purpose with improved input characteristics	7.5	50	250	1	.5	C		X	X		X		
OP-07	Ultra low offset voltage	.075	2.8	±3	0.6	0.17	M, C		X					X
OP-07A	Ultra low offset voltage	.025	2	±2	0.6	0.17	M, C		X					X
OP-07C	Ultra low offset voltage	.150	6	±7	0.6	0.17	C		X					X
OP-07D	Ultra low offset voltage	.150	6	±12	0.6	0.17	C		X					X
OP-07E	Ultra low offset voltage	.075	3.8	±4	0.6	0.17	C		X					X
OP-27A	Ultra low noise	.025	35	±40	8.0	2.8	M, C	X	X					
OP-27B	Ultra low noise	.060	50	±55	8.0	2.8	M, C	X	X					
OP-27C	Ultra low noise	.100	75	±80	8.0	2.8	M, C	X	X					
OP-27E	Ultra low noise	.025	35	±40	8.0	2.8	M, C	X	X					
OP-27F	Ultra low noise	.060	50	±55	8.0	2.8	M, C	X	X					
OP-27G	Ultra low noise	.100	75	±80	8.0	2.8	M, C	X	X					
OP-37A[5]	High slew rate, low noise	.025	35	±40	63[1]	11	M, C	X	X					
OP-37B[5]	High slew rate, low noise	.060	50	±55	63[1]	11	M, C	X	X					
OP-37C[5]	High slew rate, low noise	.100	75	±80	63[1]	11	M, C	X	X					
OP-37E[5]	High slew rate, low noise	.025	35	±40	63[1]	11	M, C	X	X					
OP-37F[5]	High slew rate, low noise	.060	50	±55	63[1]	11	M, C	X	X					
OP-37G[5]	High slew rate, low noise	.100	75	±80	63[1]	11	M, C	X	X					

Notes: 1. Gain bandwidth product for 5534/A series and closed loop bandwidth for OP-07 series.
2. Operating Temperature Range: M = -55°C to +125°C; I = -25°C to +85°C; C = 0°C to +70°C
3. RM/RC 5534A guarantees maximum input noise specification.
4. Most devices available in Flatpak — consult factory.
5. Preliminary specifications.
6. Available as a beam leaded device in chip form only.

Single Operational Amplifiers (Cont'd)

Type	Description	Maximum Input Specifications @ 25°C			Typ[1] Unity Gain BW (MHz)	Typ Slew Rate (V/μS)	Temp[2] Range	Available Packages[4]						
		Offset Voltage (mV)	Offset Current (nA)	Bias Current (nA)				DC	DE	H	M	N	NB	T
RC709[6]	General purpose	7.5	500	1500	1	.4	C	X						X
RM709[6]	General purpose	3	100	300	1	.4	M	X						X
RC714	Precision	0.075	2.8	±3	.5	0.17	C		X	X				
RC714C	Precision	0.150	6.0	±7	.5	0.17	C		X	X				
RC714E	Precision	0.075	3.8	±4	.5	0.17	C		X	X				
RC714L	Precision	0.250	20	±30	.5	0.17	C		X	X				
RC725	High accuracy, low drift	2.5	35	125	.5	.01	C		X					X
RM725	High accuracy, low drift	1	20	100	.5	.01	M		X					X
RC741[6]	General purpose, internal comp	6	200	500	1	5	C	X	X				X	X
RC3078	Programmable micropower	4.5	32	170	—	.04	C		X				X	X
RM3078A	Programmable micropower	3.5	2.5	12	—	.04	A		X					X
RC4131	High-speed, wide bandwidth	5	20	150	4	2	C						X	X
RM4131	High-speed, wide bandwidth	2	10	50	4	2	M		X					X
RC4132[6]	Micropower (2mW max.)	5	5	25	.3	.13	C		X				X	X
RM4132[6]	Micropower (1.8 mW max.)	3	2	10	.3	.13	M		X					X
RC4531	High slew rate	6	200	1500	.5	35	C	X					X	X
RM4531	High slew rate	5	200	500	.5	35	M	X						X
RC5534	High performance, low noise	4	300	1500	10	13	C		X				X	X
RM5534	High performance, low noise	2	200	800	10	13	M		X					X
RC5534A[3]	High performance, low noise	4	300	1500	10	13	C		X				X	X
RM5534A[3]	High performance, low noise	2	200	800	10	13	M		X					X

Notes: 1. Gain bandwidth product for 5534/A series and closed loop bandwidth for OP-07 series.
2. Operating Temperature Range: M = -55°C to +125°C; I = -25°C to +85°C; C = 0°C to +70°C
3. RM/RC 5534A guarantees maximum input noise specification.
4. Most devices available in Flatpak — consult factory.
5. Preliminary specifications.
6. Available as a beam leaded device in chip form only.

Dual Operational Amplifiers

Type	Description	Maximum Input Specifications @ 25°C			Typ[1] Unity Gain BW (MHz)	Typ Slew Rate (V/μS)	Temp[2] Range	Available Packages[4]						
		Offset Voltage (mV)	Offset Current (nA)	Bias Current (nA)				DB	DC	DE	J	M	NB	T
LH2101A	High performance	2	10	75	—	10					X			
LH2201A	High performance	2	10	75	—	10					X			
LH2301A	High performance	7.5	50	250	—	10					X			
LM358	Single Supply	7	100	250	1	—	C					X	X	
RC747	Dual 741	6	200	500	1	.5	C	X	X					X
RM747	Dual 741	5	200	500	1	.5	M		X					X
RC1458	Dual 741	6	200	500	1	.5	C			X			X	X
RM1558	Dual 741	5	200	500	1	.5	M			X				X
RC2041	High performance, low noise	3	200	500	7(4)	3	C					X	X	
RC2043	High Performance, low noise	3	200	1000	14(8)	6	C					X	X	
RC4556	High performance	6	200	500	8(5)	3	C					X	X	
RC4558	Wideband 741	6	200	500	3	1	C			X		X	X	X
RM4558	Wideband 741	5	200	500	3	1	M			X				X
RV4558	Wideband 741	6	200	500	3	1	I			X			X	X
RC4559	High performance	6	100	250	4(3)	2(1.5)	C			X		X	X	X
RM4559	High performance	5	100	250	4(3)	2(1.5)	M			X				X
RV4559	High performance	6	100	250	4(3)	2(1.5)	I			X			X	X
RC4560	High performance	6	200	500	10(7)	4	C					X	X	
RC4562	High performance	6	200	500	15(8)	7	C					X	X	
RC4739	Low noise, wideband 741	6	200	500	3	1	C	X						
RC5532	High performance, low noise	4	150	800	10	8	C			X			X	X
RM5532	High performance, low noise	2	100	400	10	8	M			X				X
RC5532A[3]	High performance, low noise	4	150	800	10	8	C			X			X	X
RM5532A[3]	High performance, low noise	2	100	400	10	8	M			X				X

Notes: 1. Gain bandwidth product for 5532A series.
2. Operating Temperature Range: M = -55°C to +125°C; I = -40°C to +85°C; C = 0°C to +70°C
3. RM/RC 5532A guarantees maximum input noise specification.
4. Most devices available in Flatpak — consult factory.
( ) Denotes guaranteed specifications.

Quad Operational Amplifiers

Type	Description	Maximum Input Specifications @ 25°C			Typ[1] Unity Gain BW (MHz)	Typ Slew Rate (V/μS)	Temp[1] Range	Available Packages[2]				
		Offset Voltage (mV)	Offset Current (nA)	Bias Current (nA)				DB	DC	J	M	N
HA4741-2	741 general purpose	3	30	200	3.5	1.6	M		X			
HA4741-5	741 general purpose	5	50	300	3.5	1.6	C	X	X			
LM124	Single supply	5	±30	150	1	—	M			X		
LM146	Programmable	5	20	100	1.2	0.4	M			X		
LM148	Low power 741	5	±25	100	1	0.5	M			X		
LM224	Single supply	5	±30	150	1	—	I			X		X
LM246	Programmable	6	100	250	1.2	0.4	I			X		X
LM248	Low power 741	6	±50	200	1	0.5	I			X		X
LM324	Single supply	7	±50	250	1	—	C			X	X	X
LM346	Programmable	6	100	250	1.2	0.4	C			X		X
LM348	Low power 741	6	±50	200	1	0.5	C			X		X
LM2900	Current mode, single supply	—	—	200	2.5	±.5/-20	I					X
LM2902	General purpose, single supply	7	±50	250	1	—	I			X		X
LM3900	Current mode, single supply	—	—	200	2.5	±.5/-20	C					X
RV3301	Current mode, single supply	—	—	300	4	0.6	I	X				
RC3401	Current mode, single supply	—	—	300	5	0.6	C	X				
RC3403A	Ground sensing	5	50	200	1	2	C	X	X			
RV3403A	Ground sensing	5	50	200	1	2	I	X	X			
RM3503A	Ground sensing	4	50	200	1	2	M		X			
RC4136	741 general purpose	6	200	500	3	1	C	X	X			
RM4136	741 general purpose	4	150	400	3	1.5	M		X			
RC4149	346 programmable	6	100	250	1	1.5	C	X	X			
RM4149	346 programmable	5	20	100	1	1.5	M		X			
RV4149	346 programmable	5	20	100	1	1.5	M	X	X			
RC4156	High performance	5	50	300	3.5(2.8)	1.6(1.3)	C	X	X			
RM4156	High performance	3	30	200	3.5(2.8)	1.6(1.3)	M		X			
RV4156	High performance	5	50	300	3.5(2.8)	1.6(1.3)	I	X	X			
RC4157	High speed, decompensated	5	50	300	19(15)	8(6.5)	C	X	X			
RM4157	High speed, decompensated	3	30	200	19(15)	8(6.5)	M		X			
RV4157	High speed, decompensated	5	50	300	19(15)	8(6.5)	I	X	X			

Notes: 1. Operating Temperature Range: M = -55°C to +125°C; I = -25°C to +85°C; C = 0°C to +70°C
2. Most devices available in Flatpak — consult factory.
( ) Denotes guaranteed specification.

Comparators

Type	Description	Maximum Input Specifications @ 25°C			Voltage Gain (V/mV Typ)	Maximum Saturation Voltage	Output Leakage Current (nA Typ)	Available Packages					
		Offset Voltage (mV)	Bias Current (nA)	Offset Current (nA)				DB	DE	H	J	M	N
LH2111	Dual precision voltage	3.0	10	100	200	1.5V	0.2	X	X				
LH2211	Dual precision voltage	3.0	10	100	200	1.5V	0.2	X	X				
LH2311	Dual precision voltage	7.5	50	250	200	1.5V	0.2	X	X				
LM111	Low input current	3.0	10	100	200	1.5V	0.2		X	X			
LM139	Quad single supply	±5.0	100	±25	200	400mV	0.1				X		
LM311	Low input current	7.5	50	250	200	1.5V	0.2		X	X			
LM339	Quad single supply	±5.0	250	±50	200	400mV	0.1				X	X	X
LM393	Dual low power	±5.0	250	±50	200	400mV	0.1					X	X
LM2901	Quad single supply	±7.0	250	±50	100	400mV	0.1						X
RC2403	Dual Low Power	±10	500	±100	200	400mV	0.1					X	X
RC3302	Quad single supply	±20	500	±100	30	500mV	0.1	X					

*at I_{SINK} = 15mA

Timers

Type	Description	Supply Voltage (V max)	Supply Current (mA max)	Timing Error			Trigger Voltage (V)	Trigger Current (μA Typ)	Available Packages					
				Initial Accuracy (%)	Drift with Temp (ppm/°C)	Drift with Supply Voltage (%/Volt)			DB	DC	DE	M	NB	T
RC555	Single	16	6.0	1.0	50.1	0.1	1.67	0.5			X	X	X	X
RM555	Single	18	5.0	2.0	100	0.2	1.9	0.5			X			X
RC556	Dual 555	16	6.0	2.25	150	0.3	5.0	0.5	X	X				
RM556	Dual 555	18	5.0	1.5	90	0.15	5.0	0.5		X				

LINEAR SPECIAL PURPOSE PRODUCTS

Voltage-to-Frequency Converters

Features

- Single Supply Operation
- Pulse Output Compatible with all Logic Forms (DTL/TTL/CMOS)
- Programmable Scale Factor (K)
- High Noise Rejection
- Inherent Monotonicity
- Easily Transmittable Output
- Simple Full Scale Trim
- Single-Ended Input, Referenced to Ground
- V-F or F-V Conversion
- Voltage or Current Input
- Wide Dynamic Range

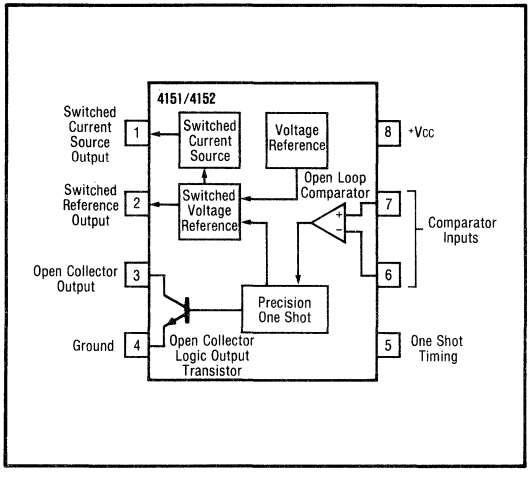
4153 Only

- 0.1Hz to 250kHz Dynamic Range
- 0.01% FS Maximum Nonlinearity Error (0.1Hz to 10kHz)
- 50ppm/°C Maximum Gain Temperature Coefficient (External Reference)
- Minimal External Components Required

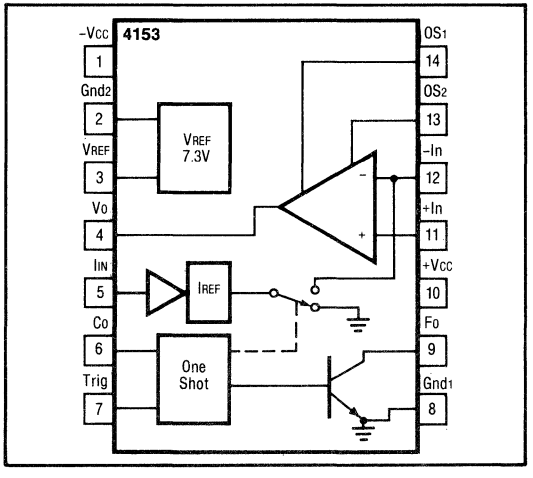
Applications (Application Book Available)

- Precision Voltage-to-Frequency Converters
- Pulse-Width Modulators
- Programmable Pulse Generators
- Frequency-to-Voltage Converters
- Integrating Analog-to-Digital Converters
- Long-Term Analog Intergrators
- Singal Conversion —
  Current-to-Frequency
  Temperature-to-Frequency
  Pressure-to-Frequency
  Capacitance-to-Frequency
  Frequency-to-Current
- Signal Isolation
  VFC — Opto-Isolation — FVC
  ADC with Opto-Isolation
- Signal Encoding
  FSK Modulation/Demodulation
  Pulse-Width Modulation
- Frequency Scaling
- DC Motor Speed Control

4151/4152 Functional Block Diagram



4153 Functional Block Diagram



Voltage-to-Frequency Converters

Basic Key Parameters

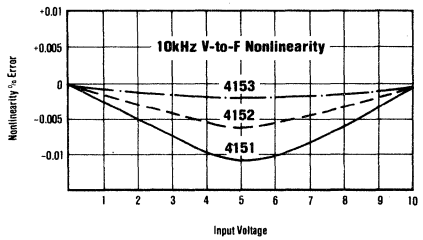
Device	Voltage Supply (V)	Linearity (%)	Temperature Stability (ppm/°C)
RC4151	+8 to +22	0.05	100 Typ
RC4152	+7 to +18	0.05	150 Max
RC4153	-18 to +18	0.01	100 Max

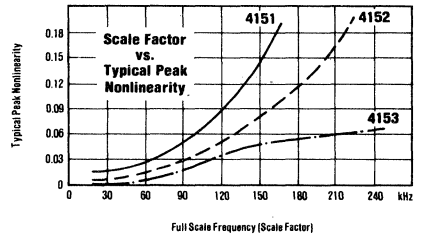
Ordering Information

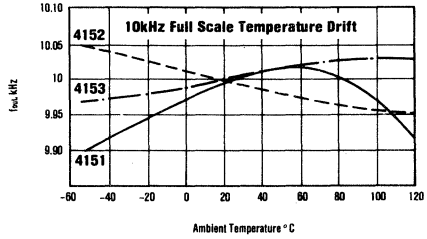
Part Number	Package	Operating Temperature Range
RC4151DE	Ceramic	0°C to +70°C
RC4151NB	Plastic	0°C to +70°C
RC4151T	TO-99	0°C to +70°C
RM4151DE	Ceramic	-55°C to +125°C
RM4151DE/883B*	Ceramic	-55°C to +125°C
RM4151T	TO-99	-55°C to +125°C
RM4151T/883B*	TO-99	-55°C to +125°C
RV4151DE	Ceramic	-40°C to +85°C
RV4151NB	Plastic	-40°C to +85°C
RC4152DE	Ceramic	0°C to +70°C
RC4152NB	Plastic	0°C to +70°C
RC4152T	TO-99	0°C to +70°C
RM4152DE	Ceramic	-55°C to +125°C
RM4152DE/883B*	Ceramic	-55°C to +125°C
RM4152T	TO-99	-55°C to +125°C
RM4152T/883B*	TO-99	-55°C to +125°C
RV4152DE	Ceramic	-40°C to +85°C
RV4152DE	Ceramic	-40°C to +85°C
RC4153DC	Ceramic	0°C to +70°C
RM4153DC	Ceramic	-55°C to +125°C
RM4153DC/883B*	Ceramic	-55°C to +125°C
RV4153DC	Ceramic	-40°C to +85°C

*Mil-Std-883 Class B

Performance Characteristics







RAYTHEON

723 Precision Voltage Regulator

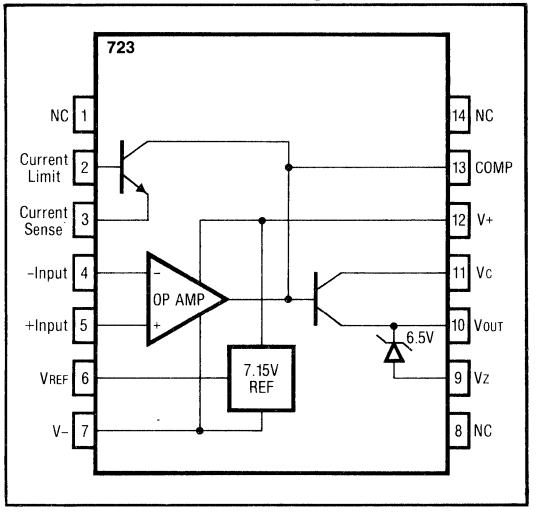
Features

- Positive or Neg Supply Operation
- Series, Shunt, Switching or Floating Operation
- ±0.01% Line and Load Regulation
- Adjustable Output 2V to 37V
- Output Current to 150mA

Ordering Information

Part Number	Package	Operating Temperature Range
RC723DB	Plastic	0°C to +70°C
RC723DC	Ceramic	0°C to +70°C
RC723T	TO-99	0°C to +70°C
RM723DC	Ceramic	-55°C to +125°C
RM723T	TO-99	-55°C to +125°C

Functional Block Diagram



4191/92/93 Micro-Power Switching Regulators

Features

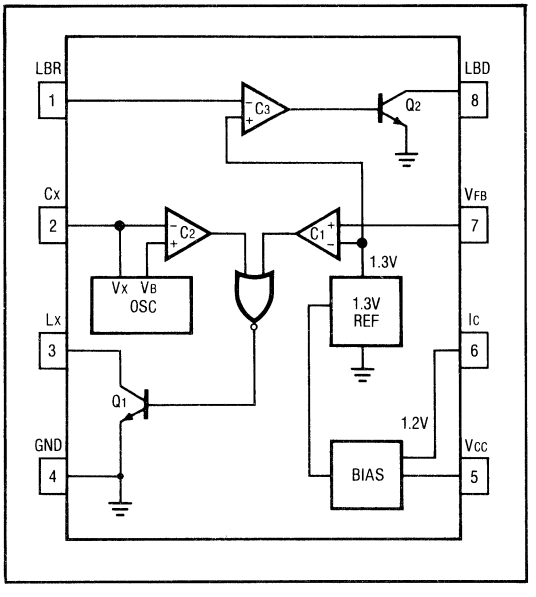
- High Efficiency: 80% Typical
- Low Quiescent Current: 135μA
- Adjustable Output:
  - 4191 ..... 2.5V to 30V
  - 4192 ..... 2.5V to 30V
  - 4193 ..... 2.5V to 24V
- Output Current: 150mA
- Low Battery Indicator Detection
- Remote Shutdown Capabilities

Ordering Information

Device Number	Package	Operating Temperature Range	Max VREF Limits @ 25°C	Max Line Regulation (% VOUT)
RC4191DE*	Ceramic	0°C to +70°C	±2.0%	0.2
RC4192NB	Plastic	0°C to +70°C	±3.0%	0.5
RC4192DE	Ceramic	0°C to +70°C	±3.0%	0.5
RC4193NB	Plastic	0°C to +70°C	±5.0%	0.5
RC4193DE	Ceramic	0°C to +70°C	±5.0%	0.5

*Also Processed to 883B

Functional Block Diagram

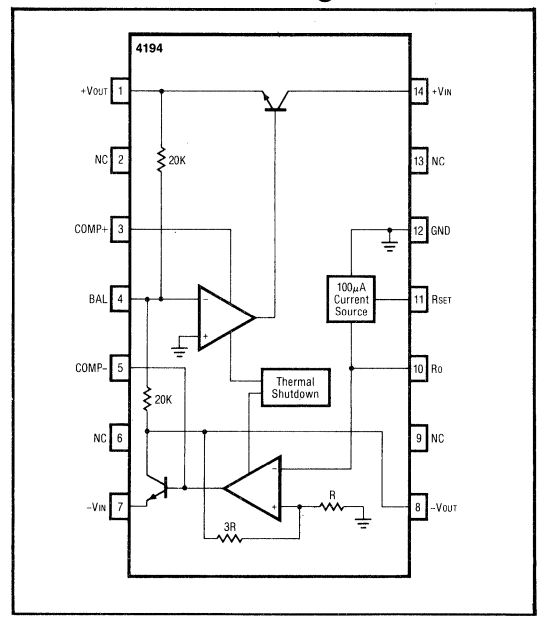


4194 Dual Tracking Voltage Regulator

Features

- Simultaneously Adjustable Outputs with Just One Resistor to ±42V
- Load Current ±200mA with 0.2% Load Regulation
- Internal Thermal Shutdown at T_J = 175°C
- External Balance for V_O Unbalancing
- 3W Power Dissipation

Functional Block Diagram



Ordering Information

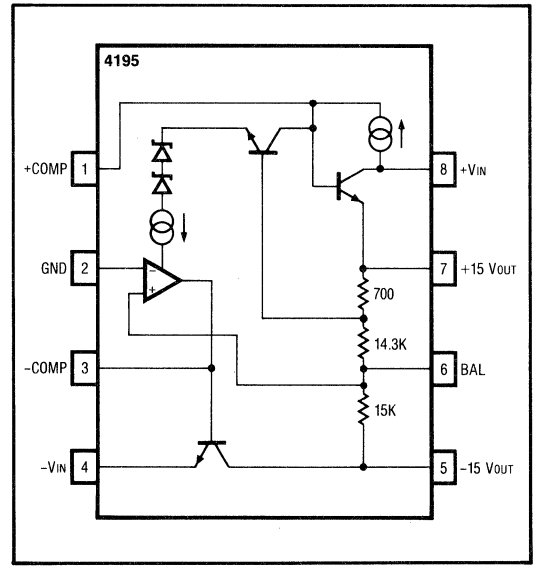
Part Number	Package	Operating Temperature Range
RC4194DB	Plastic	0°C to +70°C
RC4194DC	Ceramic	0°C to +70°C
RC4194TK	TO-66	0°C to +70°C
RM4194DC	Ceramic	-55°C to +125°C
RM4194TK	TO-66	-55°C to +125°C

4195 Fixed 15V Dual Tracking Voltage Regulator

Features

- ±15V Output at Currents up to 100mA
- Designed for On-Card Regulation
- Eliminates Distribution Problems Associated with Single Point Regulation
- Thermal Shutdown at T_J = ±175°C
- Short Circuit Protection
- Can be Used as Single Output Regulator . . . Up to 50V Output

Functional Block Diagram



Ordering Information

Part Number	Package	Operating Temperature Range
RC4195DC	Ceramic	0°C to +70°C
RC4195NB	Plastic	0°C to +70°C
RC4195T	TO-99	0°C to +70°C
RC4195TK	TO-66	0°C to +70°C
RM4195DC	Ceramic	-55°C to +125°C
RM4195T	TO-99	-55°C to +125°C
RM4195TK	TO-66	-55°C to +125°C

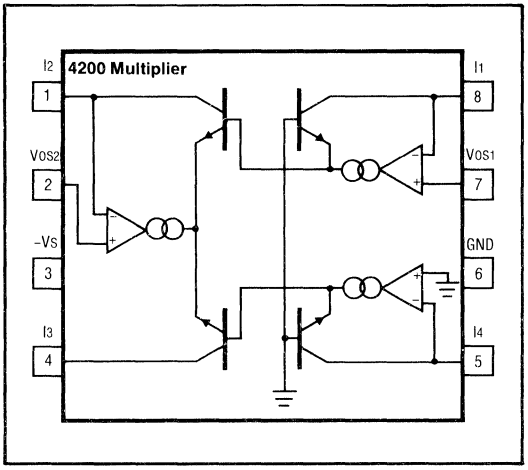
RAYTHEON

4200 Precison Analog Multiplier

Features

- High Accuracy
  Nonlinearity — 0.1% Maximum
  Temperature Coefficient — 0.005%/°C Maximum
- Multiple Functions
  Multiply, Divide, Square, Square Root, RMS-to-DC Conversion, AGC, and Modulate/Demodulate
- Wide Bandwidth — 4MHz
- Signal-to-Noise Ratio of 94dB

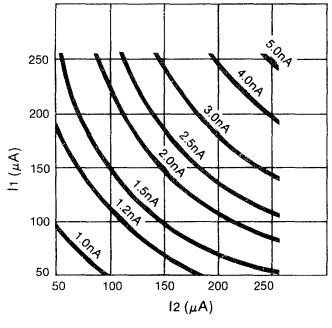
Functional Diagram

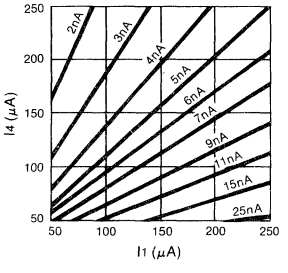


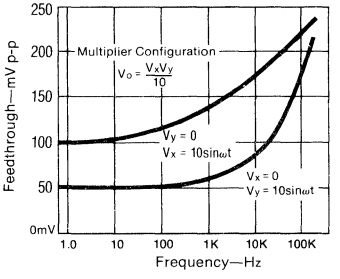
Ordering Information

Part Number	Package	Operating Temperature Range
RC4200ADE	Ceramic	0°C to +70°C
RC4200ANB	Plastic	0°C to +70°C
RC4200DE	Ceramic	0°C to +70°C
RC4200NB	Plastic	0°C to +70°C
RM4200ADE	Ceramic	-55°C to +125°C
RM4200DE	Ceramic	-55°C to +125°C
RV4200ADE	Ceramic	-40°C to +85°C
RV4200ANB	Plastic	-40°C to +85°C
RV4200DE	Ceramic	-40°C to +85°C
RV4200NB	Plastic	-40°C to +85°C

Performance Characteristics







High-Speed Multipling D/A Converters

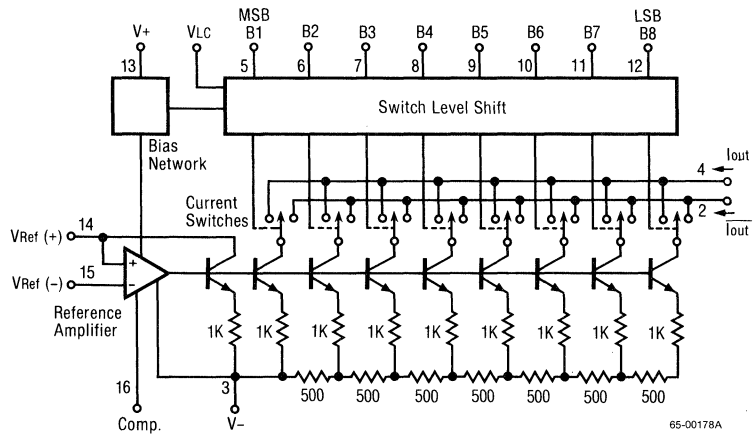
Features

- Resolution
  - DAC-08 ..... 8-Bit
  - DAC-10 ..... 10-Bit
  - DAC-6012 ..... 12-Bit
- Nonlinearity
  - DAC-08 ..... ±0.1%
  - DA-10 ..... ±0.05%
  - DAC-6012 ..... ±0.05%
- Differential Nonlinearity
  - DAC-6012 ..... ±0.012%
- Settling Time
  - DAC-08 ..... 85nS
  - DAC-10 ..... 85nS
  - DAC-6012 ..... 250nS
- Full Scale Temperature Coefficient
  - DAC-08 ..... ±50ppm/°C
  - DAC-10 ..... ±25ppm/°C
  - DAC-6012 ..... ±20ppm/°C

Ordering Information

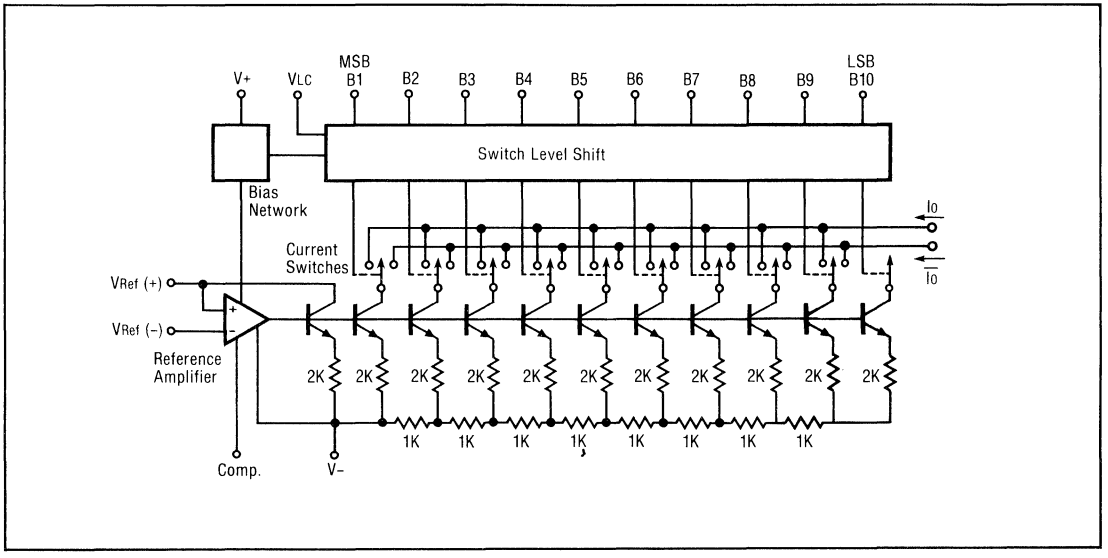
Part Number	Package	Operating Temperature Range	Nonlinearity
DAC-08ADM	Ceramic	-55°C to +125°C	±0.1%
DAC-08DM	Ceramic	-55°C to +125°C	±0.19%
DAC-08HDC	Ceramic	0°C to +70°C	±0.1%
DAC-08EDC	Ceramic	0°C to +70°C	±0.19%
DAC-08CDC	Ceramic	0°C to +70°C	±0.39%
DAC-10BDM	Ceramic	-55°C to +125°C	±0.05%
DAC-10CDM	Ceramic	-55°C to +125°C	±0.05%
DAC-10FDC	Ceramic	0°C to +70°C	±0.05%
DAC-10GDC	Ceramic	0°C to +70°C	±0.1%
DAC-6012ADM	Ceramic	-55°C to +125°C	±0.05%
DAC-6012DM	Ceramic	-55°C to +125°C	±0.05%
DAC-6012ADC	Ceramic	0°C to +70°C	±0.05%
DAC-6012DC	Ceramic	0°C to +70°C	±0.05%

DAC-08 Functional Block Diagram

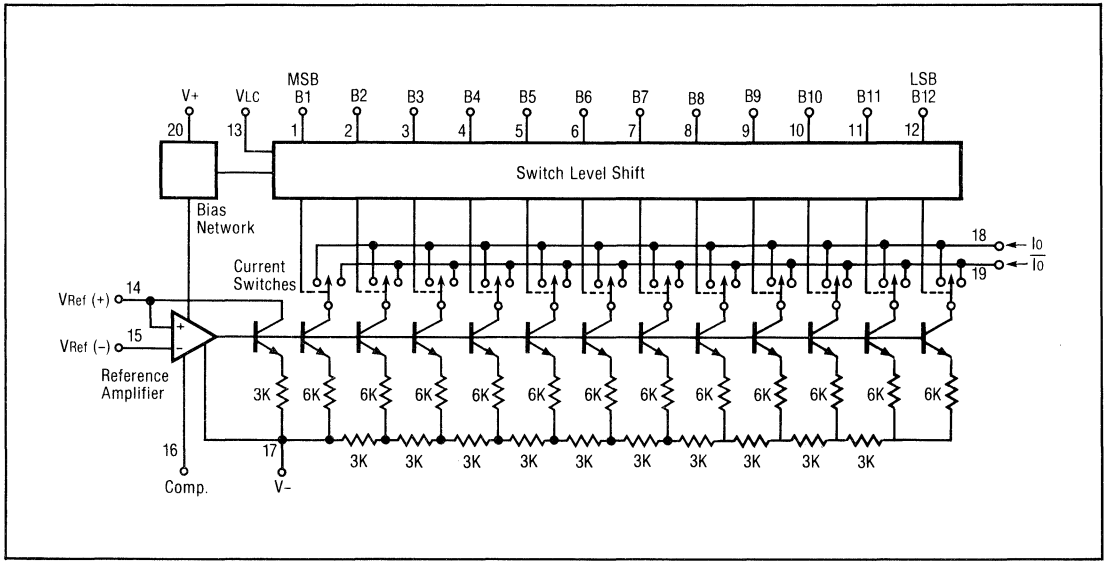


RAYTHEON

DAC-10 Functional Block Diagram



DAC-6012 Functional Block Diagram



XR-2207 Voltage-Controlled Oscillator

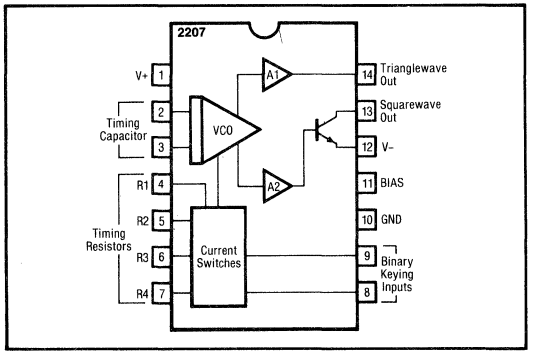
Features

- Excellent Temperature Stability (20ppm/°C)
- Linear Frequency Sweep
- Adjustable Duty Cycle (0.1% to 99.9%)
- Two or Four Level FSK Capability
- Wide Sweep Range (1000: 1Min)
- Logic Compatible Input and Output Levels
- Wide Supply Voltage Range (±4V to ±13V)
- Low Supply Sensitivity (0.15%/V)
- Wide Frequency Range (0.01Hz to 1MHz)
- Simultaneous Triangle and Squarewave Outputs

Applications

- FSK Generation
- Voltage and Current-to-Frequency Conversion
- Stable Phase-Locked Loop
- Waveform Generation Triangle, Sawtooth, Pulse, Squarewave
- FM and Sweep Generation

Functional Block Diagram



Ordering Information

Part Number	Package	Operating Temperature Range
XR-2207CN	Ceramic	0°C to +70°C
XR-2207CP	Plastic	0°C to +70°C
XR-2207N	Ceramic	-40°C to +85°C
XR-2207P	Plastic	-40°C to +85°C
XR-2207M	Ceramic	-55°C to +125°C

XR-2211 FSK Demodulator/Tone Decoder

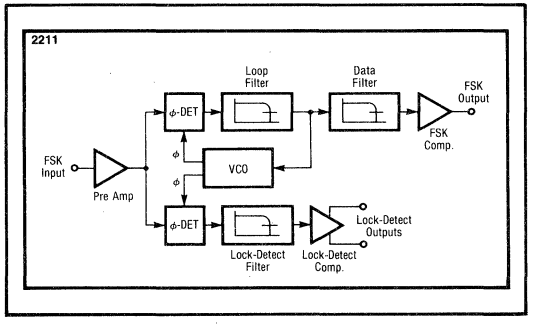
Features

- Wide Frequency Range (0.01Hz to 300kHz)
- Wide Supply Voltage Range (4.3V to 20V)
- DTL/TTL/ECL Logic Compatibility
- FSK Demodulation with Carrier-Detection
- Wide Dynamic Range (2mV to 3Vrms)
- Adjustable Tracking Range (±1% to ±80%)
- Excellent Temperature Stability (20ppm/°C, Typical)

Applications

- FSK Demodulation
- Data Synchronization
- Tome Decoding
- FM Detection
- Carrier Detection

Functional Block Diagram



Ordering Information

Part Number	Package	Operating Temperature Range
Xr-2211CN	Ceramic	0°C to +70°C
XR-2211CP	Plastic	0°C to +70°C
XR-2211N	Ceramic	-40°C to +85°C
XR-2211P	Plastic	-50°C to +85°C
XR-2211M	Ceramic	-55°C to +125°C

RAYTHEON

4444 x 4x4x2 Balanced Switching Crosspoint Array

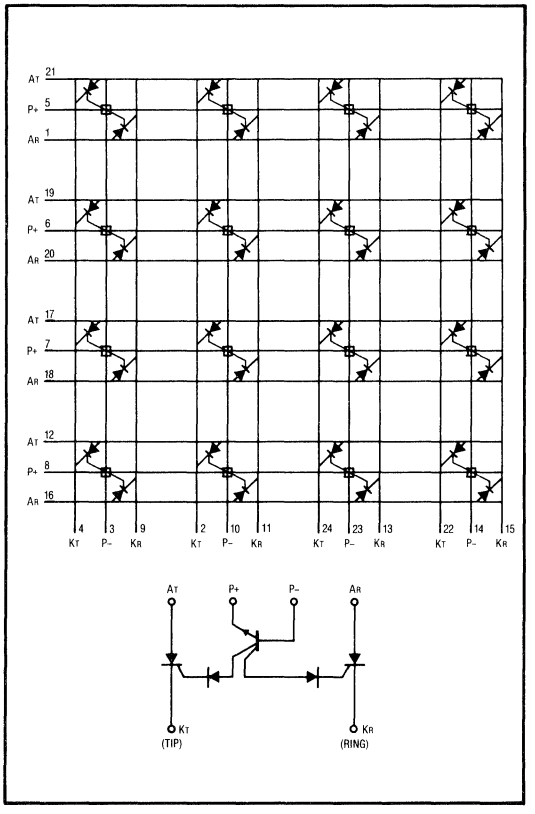
Features

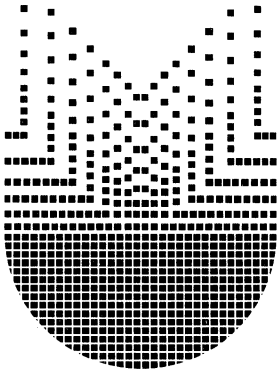
- Low Bidirectional R_{ON}
- High R_{OFF}
- Excellent Matching of Gates
- Low Capacitance
- High Rate Firing
- Predictable Holding Current

Ordering Information

Part Number	Package	Operating Temperature Range
RC4444PU	Plastic	0°C to +70°C
RC4444R	Ceramic	0°C to +70°C
RM4444R	Ceramic	-55°C to +125°C

Schematic Diagram





SECTION 2 BIPOLAR MEMORY PRODUCTS

Table of Contents

Description

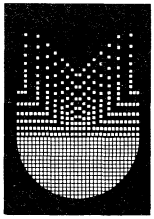
Raytheon's 29000 Series of Field-Programmable Read-Only Memories includes most of the popular PROM configurations in both standard and power-switched versions. The power-switched devices (SPROMs) were originated by Raytheon to reduce overall power dissipation in large PROM arrays. This technique takes advantage of the non-volatile nature of PROMs by removing power when a particular device is not being used in the system. Unlike previous power-switching schemes, which employed external transistors and resistors, the SPROM includes all power-switching circuitry on the same Chip Select (CS) input that is used to address a standard PROM; thus, in most cases, SPROMs can be directly substituted for standard devices without system redesign.

Features

- Low-Power Schottky Technology
- Highly Reliable Nichrome Fuses
- Typical SPROM "OFF" Power is 25% of Standard Power.
- SPROMs Feature Guaranteed Access Times and Full V_{CC} Tolerance Under Power-Switched Conditions.
- All Devices Use Same Programming Techniques (Generic)
- All Devices Available in both Commercial (0°C to 75°C) and Military (-55°C to +125°C) Versions.
- All Devices are Industry Standard Pin-Out
- All Devices Available in Flat Packages
- 16K and 32K Devices are Available in 0.3" Wide 24 Pin Dual-in-Line Packages.
- 16K and 32K Devices Available in Leadless Chip Carriers

PROM/SPROM Performance Characteristics

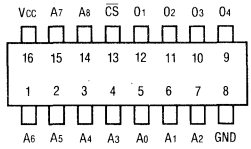
			Power Supply Current				Maximum AC Characteristics					
			Typical		Maximum		Commercial			Military		
Part No.	Org.	Pkg (Pins)	Selected (mA)	Unselected (mA)	Selected (mA)	Unselected (mA)	T_{AA} (nS)	T_{EA} (nS)	T_{ER} (nS)	T_{AA} (nS)	T_{EA} (nS)	T_{ER} (nS)
29611	512 x 4	16	90	90	130	130	55	30	30	70	40	40
29611A	512 x 4	16	90	90	130	130	40	30	30	60	40	40
29613	512 x 4	16	90	30	130	45	60	60	30	75	75	40
29613A	512 x 4	16	90	30	130	45	45	50	30	60	65	40
29621	512 x 8	20	90	90	155	155	65	30	30	80	40	40
29621A	512 x 8	20	90	90	155	155	50	30	30	60	40	40
29623	512 x 8	20	90	30	155	45	70	70	30	85	85	40
29623A	512 x 8	20	90	30	155	45	50	55	30	60	65	40
29631	1024 x 8	24	120	120	170	170	70	35	30	90	45	40
29631A	1024 x 8	24	120	120	170	170	50	35	30	60	40	40
29633	1024 x 8	24	110	30	170	45	70	75	30	80	115	40
29633A	1024 x 8	24	110	30	170	170	50	50	30	70	70	40
29651	2048 x 4	18	120	120	170	170	70	40	35	90	50	45
29651A	2048 x 4	18	120	120	170	170	60	35	35	70	45	45
29653	2048 x 4	18	110	30	170	45	75	80	35	90	95	45
29653A	2048 x 4	18	110	30	170	45	65	70	35	75	80	45
29671	4096 x 8	24	150	150	195	195	80	40	40	100	50	45
29671A	4096 x 8	24	150	150	195	195	70	35	30	80	45	35
29673	4096 x 8	24	150	40	195	50	85	85	45	105	105	50
29681	2048 x 8	24	125	125	180	180	80	40	40	100	50	45
29681A	2048 x 8	24	125	125	180	180	50	35	30	70	45	35
29683	2048 x 8	24	125	30	180	45	85	85	45	105	105	50
29683A	2048 x 8	24	125	30	180	45	50	65	35	70	75	45



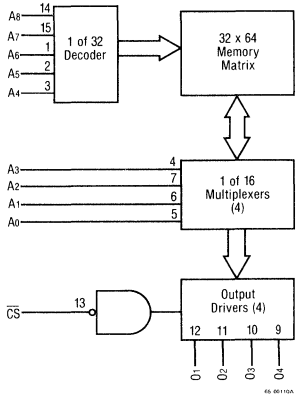
Bipolar PROM/SPROM Cross Reference Guide

No. of Bits	Org	Pkg	Output	Raytheon Part No.		Other Manufacturers											
				PROM	SPROM	AMD	Fairchild	Fujitsu	Harris	Hitachi	Intel	Intersil	MMI	National	NEC	Signetics	Supertex	TI
2K	512 x 4	16	TS	29611	29613	27S13	93446	MBM7053	7621			5624	6306	54S571		82S131		
4K	512 x 8	20	TS	29621	29623	27S29			7649				6349	54S472		82S147		TBP28S42 TBP28P42
8K	1024 x 8	24	TS	29631 29631A	29633 29633A	27S181	93451	MB7132	7681	HN25089	3628		6381	87S181		82S181 82PS181	82S181	TBP28S86 TBP28P86
8K	2048 x 4	18	TS	29651 29651A	29653 29653A	27S185 27S185A 27PS185		MB7128	7685					87S185		82S185		TBP24S81
16K	2048 x 8	24	TS	29681 29681A	29683 29683A	27S191 27S191A 27PS191	93511	MB7138	76161	HN25169	3636 3636B			87S191	μBP429	82S191	82S191	TBP28S166 TBP28P166
32K	4096 x 8	24	TS	29671 29671A	29673			MB7142	76321		3632					82S321		

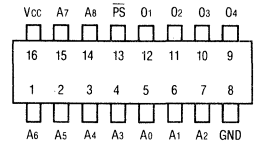
Pin Out Information and Block Diagrams



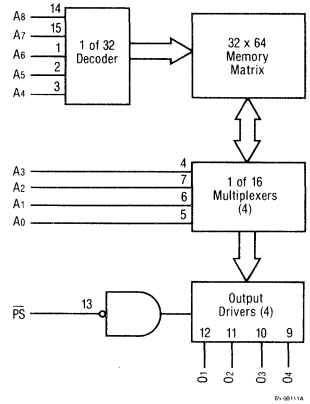
Pin 13 is also the programming pin (pp).



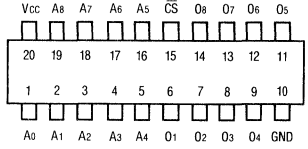
512 x 4
29611



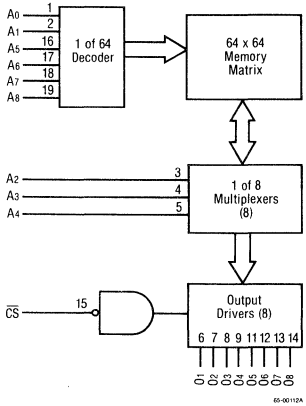
Pin 13 is also the programming pin (pp).



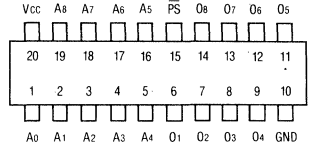
512 x 4
29613



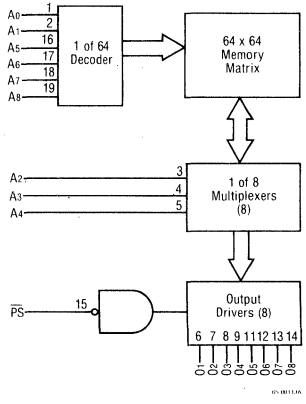
Pin 15 is also the programming pin (pp).



512 x 8
29621



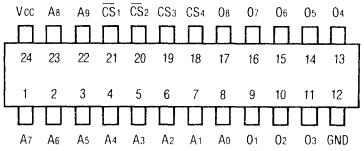
Pin 15 is also the programming pin (pp).



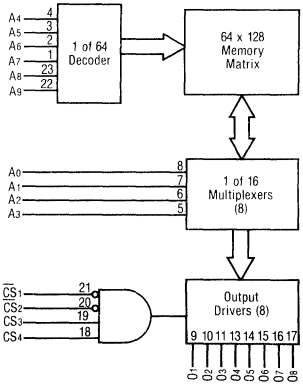
512 x 8
29623

RAYTHEON

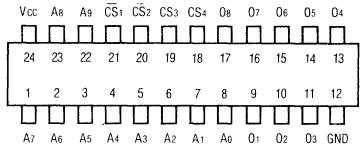
Pin Out Information and Block Diagrams



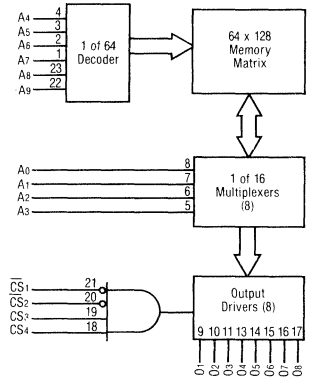
Pin 20 is also the programming pin (pp).



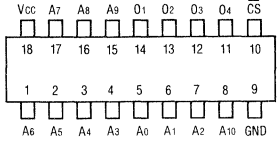
1024 x 8
29631/29631A



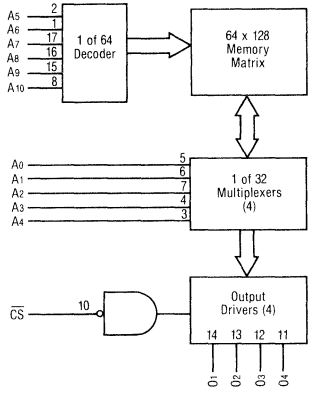
Pin 20 is also the programming pin (pp).



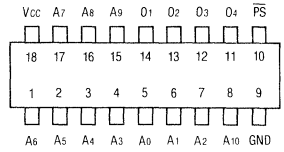
1024 x 8
29633/29633A



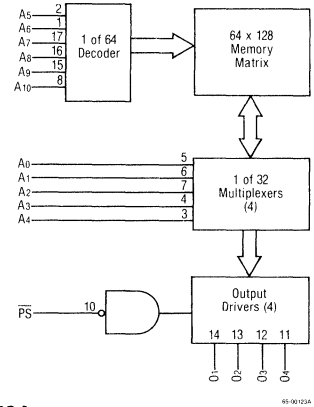
Pin 10 is also the programming pin (pp).



2028 x 4
29651/29651A

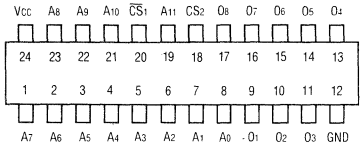


Pin 10 is also the programming pin (pp).

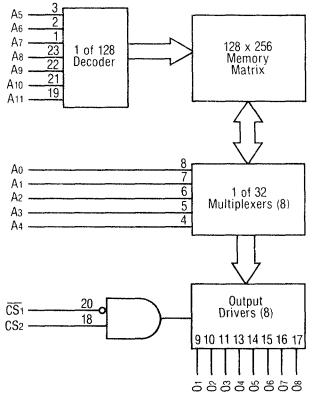


2048 x 4
29653/29653A

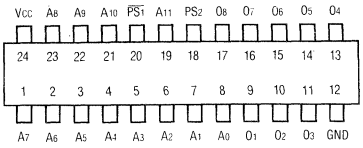
Pin Out Information and Block Diagrams



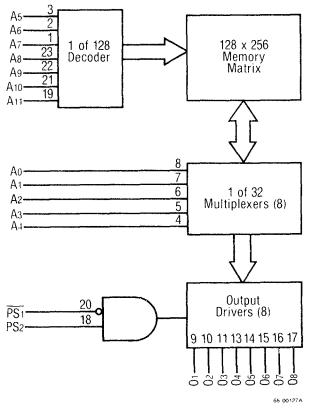
Pin 20 is also the programming pin (pp).



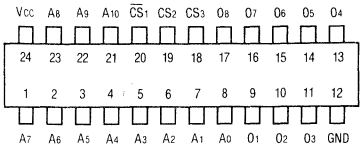
4096 x 8
29671/29671A



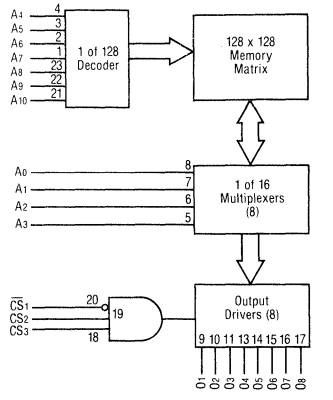
Pin 20 is also the programming pin (pp).



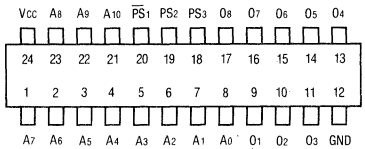
4096 x 8
29673



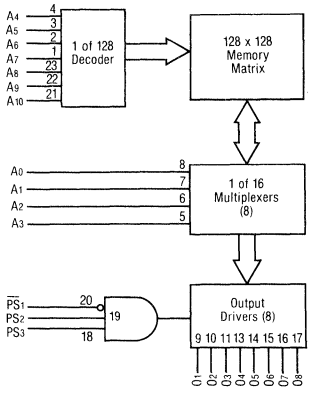
Pin 20 is also the programming pin (pp).



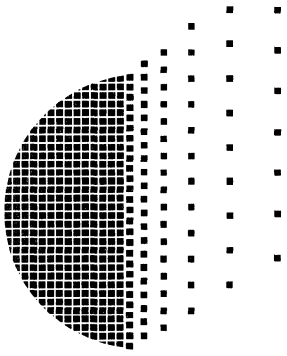
2048 x 8
29681/29681A



Pin 20 is also the programming pin (pp).



2048 x 8
29683/29683A



SECTION 3
DIGITAL

Table of Contents

Introduction

The following pages are part of Raytheon Semiconductor's Mature Digital Product Line.

These products are not recommended for new designs. However, Raytheon will continue to make product available as long as we see a sizable demand for these devices.

It is suggested that customers check with the factory periodically and advise us of their long term forecasted needs, programs involved, estimated usages and length of program.

Ray I and II Series TTL (SHUL Replacement)

Raytheon		Fanout Function	Tpd (ns) or Toggle Rate (Min)	Avg. Pwr. Function (mW) 50% Duty	DC Noise Margin (V)	Motorola Cross Reference
Part Number	Description					
RF30	Single phase RST flip-flop	15	15MHz	30	+1.1, -1.5	MC521
RF31	Single phase RST flip-flop C-DIP	7	15MHz	30	+1.1, -1.5	MC571
RF50	J-K flip-flop (AND Inputs)	15	20MHz	50	+1.1, -1.5	MC515
RF51	J-K flip-flop (AND Inputs)	7	20MHz	50	+1.1, -1.5	MC565
RF60	J-K flip-flop (OR Inputs)	15	20MHz	55	+1.1, -1.5	MC516
RF61	J-K flip-flop (OR Inputs)	7	20MHz	55	+1.1, -1.5	MC566
RF100	Dual J-K flip-flop (separate clocks)	11	35MHz	55/flip-flop	+1.0, -1.5	MC523
RF101	Dual J-K flip-flop (separate clocks)	6	35MHz	55/flip-flop	+1.0, -1.5	MC573
RF110	Dual J-K flip-flop (common clock)	11	35MHz	55/flip-flop	+1.0, -1.5	MC524
RF111	Dual J-K flip-flop (common clock)	6	35MHz	55/flip-flop	+1.0, -1.5	MC574
RF120	Dual J-K flip-flop (separate clocks)	11	50MHz	55/flip-flop	+1.0, -1.5	MC2123
RF121	Dual J-K flip-flop (separate clocks)	6	50MHz	55/flip-flop	+1.0, -1.5	MC2173
RF130	Dual J-K flip-flop (common clock)	11	50MHz	55/flip-flop	+1.0, -1.5	MC2124
RF131	Dual J-K flip-flop (common clock)	6	50MHz	55/flip-flip	+1.0, -1.5	MC2174
RF200	J-K flip-flop (AND Inputs)	11	50MHz	55	+1.0, -1.5	MC2125
RF201	J-K flip-flop (AND Inputs)	6	50MHz	55	+1.0, -1.5	MC2175
RF210	J-K flip-flop (OR Inputs)	11	50MHz	55	+1.0, -1.5	MC2126
RF211	J-K flip-flop (OR Inputs)	6	50MHz	55	+1.0, -1.5	MC2176
RF250	J-K flip-flop (AND Inputs)	11	30MHz	50	+1.1, -1.5	MC2109
RF251	J-K flip-flop (AND Inputs)	6	30MHz	50	+1.1, -1.5	MC2159
RF260	J-K flip-flop (OR Inputs)	11	30MHz	55	+1.1, -1.5	MC2110
RF261	J-K flip-flop (OR Inputs)	6	30MHz	55	+1.1, -1.5	MC2160
RF9601	Retriggerable monostable multivibrator	10mA	25	100	+1.0, -1.5	MC9601
RG40	Dual 4-Input NAND gate	15	10	15/gate	+1.1, -1.5	MC500
RG41	Dual 4-Input NAND gate	7	10	15/gate	+1.1, -1.5	MC550
RG50	Exp. 4-wide, 2-2-2-3 input AOI gate	15	12	30	+1.1, -1.5	MC501
RG51	Exp. 4-wide, 2-2-2-3 input AOI gate	7	12	30	+1.1, -1.5	MC551
RG60	Single 8-input NAND gate	15	12	15	+1.1, -1.5	MC502
RG61	Single 8-input NAND gate	7	12	15	+1.1, -1.5	MC552
RG70	Dual 2-wide, 2-input AOI gate, one side exp.	15	12	20/gate	+1.1, -1.5	MC520
RG71	Dual 2-wide, 2-input AOI gate, one side exp.	7	12	20/gate	+1.1, -1.5	MC570
RG80	Dual pulse shaper/delay AND gate	15	11	30/gate	+1.1, -1.5	MC526
RG81	Dual pulse shaper/delay AND gate	7	11	30/gate	+1.1, -1.5	MC576

Ray I and II Series TTL (SHUL Replacement)

Raytheon		Fanout Function	Tpd (ns) or Toggle Rate (Min)	Avg. Pwr. Function (mW) 50% Duty	DC Noise Margin (V)	Motorola Cross Reference
Part Number	Description					
RG90	Exclusive OR gate with complement	15	11	35	+1.1, -1.5	MC503
RG91	Exclusive OR gate with complement	7	11	35	+1.1, -1.5	MC553
RG110	Exp. 2-wide, 4-input AOI gate	15	12	20	+1.1, -1.5	MC505
RG111	Exp. 2-wide, 4-input AOI gate	7	12	20	+1.1, -1.5	MC555
RG120	Expandable single 8 NAND gate	15	18	15/gate	+1.1, -1.5	MC506
RG121	Expandable single 8 NAND gate	7	18	15/gate	+1.1, -1.5	MC556
RG130	Dual 4-input line driver	30	15	30/gate	+1.1, -1.5	MC507
RG131	Dual 4-input line driver	30	15	30/gate	+1.1, -1.5	MC557
RG140	Quad 2-input NAND gate	15	10	15/gate	+1.1, -1.5	MC508
RG141	Quad 2-input NAND gate	7	10	15/gate	+1.1, -1.5	MC558
RG150	4-wide, 2-2-2-3 input AOI expander		4	5/gate	+1.1, -1.5	MC509
RG151	4-wide, 2-2-2-3 input AOI expander		4	5/gate	+1.1, -1.5	MC559
RG160	Triple 2-input buss driver	22	15	15/gate	+1.1, -1.5	MC519
RG161	Triple 2-input buss driver	11	15	15/gate	+1.1, -1.5	MC569
RG170	2-wide, 4-input AOI expander		1	5/gate	+1.1, -1.5	MC510
RG171	2-wide, 4-input AOI expander		1	5/gate	+1.1, -1.5	MC560
RG180	Dual 4-input NAND expander		1	1	+1.1, -1.5	MC511
RG181	Dual 4-input NAND expander		1	1	+1.1, -1.5	MC561
RG190	Triple 3-input NAND/NOR gate	15	10	15/gate	+1.1, -1.5	MC512
RG191	Triple 3-input NAND/NOR gate	7	10	15/gate	+1.1, -1.5	MC562
RG200	Expandable single 8 NAND gate	11	8	22/gate	+1.0, -1.5	MC2111
RG201	Expandable single 8 NAND gate	6	8	22/gate	+1.0, -1.5	MC2161
RG210	Expandable 2-wide, 4-input AOI gate	11	7	30	+1.0, -1.5	MC2100
RG211	Expandable 2-wide, 4-input AOI gate	6	7	30	+1.0, -1.5	MC2150
RG220	Quad 2-input NAND gate	11	8	22/gate	+1.0, -1.5	MC2101
RG221	Quad 2-input NAND gate	6	6	22/gate	+1.0, -1.5	MC2151
RG230	4-wide, 2-2-2-3 input AOI expander		2	7/gate	+1.0, -1.5	MC2102
RG231	4-wide, 2-2-2-3 input AOI expander		2	7/gate	+1.0, -1.5	MC2152
RG240	Dual 4-input NAND gate	11	6	22/gate	+1.0, -1.5	MC2103
RG241	Dual 4-input NAND gate	6	6	22/gate	+1.0, -1.5	MC2153
RG250	Expandable 4-wide, 2-2-2-3 input AOI gate	11	8	40	+1.0, -1.5	MC2104
RG251	Expandable 4-wide, 2-2-2-3 input AOI gate	6	8	40	+1.0, -1.5	MC2154
RG260	Single 8-input NAND gate	11	8	22	+1.0, -1.5	MC2105
RG261	Single 8-input NAND gate	6	8	22	+1.0, -1.5	MC2155

Ray I and II Series TTL (SHUL Replacement)

Raytheon		Fanout Function	Tpd (ns) or Toggle Rate (Min)	Avg. Pwr. Function (mW) 50% Duty	DC Noise Margin (V)	Motorola Cross Reference
Part Number	Description					
RG270	2-wide, 4-input AOI expander		1	7/gate	+1.0, -1.5	MC2106
RG271	2-wide, 4-input AOI expander		1	7/gate	+1.0, -1.5	MC2156
RG280	Expandable dual 4-input AND gate	15	11	38/gate	+1.1, -1.5	MC527
RG281	Expandable dual 4-input AND gate	7	11	38/gate	+1.1, -1.5	MC577
RG290	Dual 2 and 3 input AND/OR gate exp.		7	15/gate	+1.1, -1.5	MC528
RG291	Dual 2 and 3 input AND/OR gate exp.		7	15/gate	+1.1, -1.5	MC578
RG300	Expandable 3-wide, 3-input AOI gate	11	7	35	+1.0, -1.5	MC2112
RG301	Expandable 3-wide, 3-input AOI gate	6	7	35	+1.0, -1.5	MC2162
RG310	Dual 2-wide, 2-input, AOI gate, one side exp.	11	7	30/gate	+1.0, -1.5	MC2113
RG311	Dual 2-wide, 2-input AOI gate, one side exp.	6	7	30/gate	+1.0, -1.5	MC2163
RG320	Triple 3-input NAND gate	11	6	22/gate	+1.0, -1.5	MC2107
RG321	Triple 3-input NAND gate	6	6	22/gate	+1.0, -1.5	MC2157
RG330	Quad 2-input NAND/OR gate	15	12	20	+1.1, -1.5	
RG331	Quad 2-input NAND/NOR gate	7	12	20	+1.1, -1.5	
RG340	Quad 2-input NOR gate	11	7	22	+1.0, -1.5	
RG341	Quad 2-input NOR gate	6	7	22	+1.0, -1.5	
RG370	Hex Inverter	15	10	15/Inverter	+1.1, -1.5	MC529
RG371	Hex Inverter	7	10	15/Inverter	+1.1, -1.5	MC579
RG380	Hex Inverter	11	6	22/Inverter	+1.0, -1.5	MC2116
RG381	Hex Inverter	6	6	22/Inverter	+1.0, -1.5	MC2166
RG7510	Quad 2-input line driver	30	15	30/gate	+1.1, -1.5	
RG7511	Quad 2-input line driver	15	15	30/gate	+1.1, -1.5	
RG7520	Quad 2-input lamp driver	40mA	15	30/gate	+1.1, -1.5	
RG7521	Quad 2-input lamp driver	20mA	15	30/gate	+1.1, -1.5	
RL10	Fast full adder	10	Pin 5 24 6 12 7 13	90	+0.6, -1.4	MC4326
RL11	Fast full adder	4		90	+0.6, -1.4	MC4327
RL20	Dependent carry fast adder	10	Pin 5 25 6 22 7 13	125	+0.6, -1.4	MC4328
RL21	Dependent carry fast adder	4		125	+0.6, -1.4	MC4329
RL30	Independent carry fast adder	10	Pin 5 25 6 22 7 13	125	+0.6, -1.4	MC4330
RL31	Independent carry fast adder	4		125	+0.6, -1.4	MC4331

Ray I and II Series TTL (SHUL Replacement)

Raytheon		Fanout Function	Tpd (ns) or Toggle Rate (Min)	Avg. Pwr. Function (mW) 50% Duty	DC Noise Margin (V)	Motorola Cross Reference
Part Number	Description					
RL40	Carry decoder expander		See Note 1	20	+0.7, -2.35	
RL41	Carry decoder expander			20	+0.7, -2.35	
RL60	4-bit storage register	10	25	175	+1.1, -1.5	
RL61	4-bit storage register	4	25	175	+1.1, -1.5	MC4335
RL70	4-bit storage register	10	25	175	+1.1, -1.5	
RL71	4-bit storage register	4	25	175	+1.1, -1.5	MC4337
RL80	16-bit scratch pad memory	20	27	250	+1.1, -1.5	MC4304
RL81	16-bit scratch pad memory	8	27	250	+1.1, -1.5	MC4305

1. Pin 5, $\Delta \leq 4.0$ns (Add 1 Δ/1pfd)

Operating temperature range:
Military -55°C to +125°C

Series is also available in commercial temperature range 0°C to +70°C designated by final digits 2 or 3.

Package Designations

Description	Raytheon	Motorola
14-pin ceramic dual-in-line pkg	DC	L
14-pin ceramic flatpak 1/4 x 3/16	CK	F
14-pin ceramic flatpak 1/4 x 1/4	CJ	F

8200 Series
Description and Cross Reference

Raytheon Part Number	Description	Prop. Delay (ns) or Max. Op Freq (MHz)	Pwr Diss (mW)	Package Availability	Signetics Cross Reference
RC/RM8200	Dual 5-bit buffer reg.	35	400	R, N	8200
RC/RM8201	Dual 5-bit buffer reg. (INV)	35	400	R, N	8201
RC/RM8202	10-bit buffer reg.	35	400	R, N	8202
RC/RM8203	10-bit buffer reg. (INV)	35	400	R, N	8203
RC/RM8230	8 input MUX	11	184	DD, CL	8230
RC/RM8231	8 input MUX (O.C.)	13	184	DD, CL	8231
RC/RM8232	8 input MUX	11	173	DD, CL	8232
RC/RM8233	Quad 2 input MUX	16	200	DD, CL	8233
RC/RM8234	Quad 2 input MUX (O.C.)	16	160	DD, CL	8234
RC/RM8241	Quad EX-OR gate	14	225	DC, CJ	8241
RC/RM8242	4-bit comparator (O.C.)	14	170	DC, CJ	8242
RC/RM8243	8-bit position scaler (O.C.)	25	315	R, N	8243
RC/RM8250	Binary to octal decoder	20	125	DC, CJ	8250
RC/RM8251	BCD to decimal decoder	20	135	DD, CL	8251
RC/RM8252	BCD to decimal decoder	20	135	DD, CL	8252
RC/RM8260	Arithmetic logic element	14	400	R, N	8260
RC/RM8261	Fast carry extender	13	115	DC, CJ	8261
RC/RM8262	9-bit parity generator	30	300	DC, CJ	8262
RC/RM8263	Quad 3 input MUX	17	378	R, N	8263
RC/RM8264	Quad 3 input MUX (O.C.)	25	400	R, N	8264
RC/RM8266	Quad 2 input MUX	14	200	DD, CL	8266
RC/RM8267	Quad 2 input MUX (O.C.)	17	200	DD, CL	8267
RC/RM8270	4-bit shift register	23	168	DC, CJ	8270
RC/RM8271	4-bit shift register	22	270	DD, CL	8271
RC/RM8273	10-bit serial in, parallel out reg.	35	340	DD, CL	8273
RC/RM8274	10-bit Parallel in, serial out reg.	25	380	DD, CL	8274
RC/RM8277	Dual 8-bit shift reg.	20	400	DD, CL	8277
RC/RM8280	BCD decade counter	25	185	DC, CJ	8280
RC/RM8281	4-bit binary counter	25	185	DC, CJ	8281

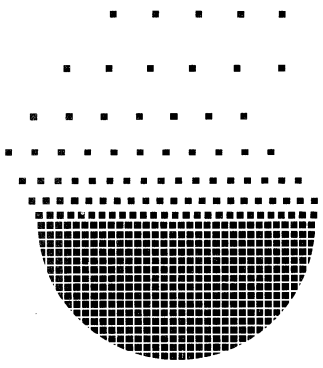
8200 Series
Description and Cross Reference

Raytheon Part Number	Description	Prop. Delay (ns) or Max. Op Freq (MHz)	Pwr Diss (mW)	Package Availability	Signetics Cross Reference
RC/RM8284	6-bit binary synchronous counter	30	315	DC, CJ	8284
RC/RM8285	Synchronous BCD decade counter	30	315	DC, CJ	8285
RC/RM8290	Presettable high speed decade counter	60	190	DC, CJ	8290
RC/RM8291	Presettable high speed binary counter	60	190	DC, CJ	8291
RC/RM8T09	Quad bus driver (tri state outputs)	16	235	DC, CJ	8T09
RC/RM8T10	Quad d-type bus flip-flop (tri state outputs)	50	250	DD, CL	8T10
RC/RM8T20	Bidirectional one-shot	30	250	DD, CL	8T20

1. Power dissipation is given for V_{CC} = 5.0 volts.
2. Propagation delays are given for the average path.
3. Operating Temperature Range
   RM: -55°C to +125°C
   RC: 0°C to +70°C
   Signetics Cross Reference
   S: -55°C to +125°C
   N: 0°C to +75°C

Package Designations

Description	Raytheon	Signetics
14-pin ceramic dual-in-line pkg	DC	F
16-pin ceramic dual-in-line pkg	DD	F
24-pin ceramic dual-in-line pkg	R	F
14-pin ceramic flatpak	CJ	W
16-pin ceramic flatpak	CL	W
24-pin ceramic flatpak	N	Q



SECTION 4
SMALL SIGNAL TRANSISTORS

Table of Contents

QPL Cross Reference Chart

Part Number	Raytheon	Crystalonics	Fairchild	Motorola	Texas Inst.	Other
2N328AJAN	■	■				
2N329AJAN	■	■				
2N497JAN	■				■	
2N498JAN	■				■	
2N656JAN	■				■	
2N657JAN	■				■	
2N696JAN	■		■			
2N697JAN	■		■			
2N706JAN	■		■	■		
2N718AJAN	■		■	■	■	
2N718AJTX	■		■	■	■	
2N718AJXV	■		■	■	■	
2N720AJAN	■		■			
2N720AJTX	■		■			
2N744JAN	■		■			
2N757AJAN	■					
2N759AJAN	■					
2N760AJAN	■					
2N910JAN	■					
2N910JTX	■					
2N911JAN	■					
2N911JTX	■					
2N912JAN	■					
2N912JTX	■					
2N916JAN	■		■	■		
2N918JAN	■		■	■		
2N918JTX	■		■	■		
2N918JXV	■		■	■		
2N929JAN	■		■	■		
2N929JTX	■		■	■		
2N930JAN	■		■	■		
2N930JTX	■		■	■		
2N1131JAN	■					
2N1132JAN	■		■	■		
2N1613JAN	■		■	■	■	
2N1613JTX	■		■	■	■	
2N1613JXV	■		■	■	■	
2N1711JAN	■		■			
2N1711JTX	■		■			
2N1890JAN	■		■			
2N1890JTX	■		■			
2N1893JAN	■		■			
2N1893JTX	■		■			
2N2060JAN	■		■	■	■	
2N2060JTX	■		■	■	■	
2N2060JXV	■			■	■	
2N2218JAN	■		■	■		
2N2218JTX	■		■	■		
2N2218JXV	■		■	■		
2N2218AJAN	■		■	■		
2N2218AJTX	■		■	■		
2N2218AJXV	■		■	■		
2N2219JAN	■		■	■	■	
2N2219JTX	■		■	■	■	
2N2219JXV	■		■	■	■	
2N2219AJAN	■		■	■	■	

Part Number	Raytheon	Crystalonics	Fairchild	Motorola	Texas Inst.	Other
2N2219AJTX	■		■	■	■	
2N2219AJXV	■		■	■		
2N2221JAN	■		■	■		
2N2221JTX	■		■	■		
2N2221JXV	■		■	■		
2N2221AJAN	■		■	■		
2N2221AJTX	■		■	■		
2N2221AJXV	■		■	■		
2N2222JAN	■		■	■	■	
2N2222JTX	■		■	■	■	
2N2222JXV	■		■	■	■	
2N2222AJAN	■		■	■	■	
2N2222AJTX	■		■	■	■	
2N2222AJXV	■		■	■	■	
2N2369AJAN	■		■	■		
2N2369AJTX	■		■	■		
2N2369AJXV	■		■	■		
2N2481JAN	■		■			
2N2481JTX	■		■			
2N2484JAN	■		■		■	
2N2484JTX	■		■		■	
2N2484JXV	■		■		■	
2N2604JAN	■		■			
2N2604JTX	■		■			
2N2604JXV	■		■			
2N2605JAN	■		■	■		
2N2605JTX	■		■	■		
2N2605JXV	■		■	■		
2N2609JAN	■		■	■		*
2N2904JAN	■		■	■	■	
2N2904JTX	■		■	■	■	
2N2904JXV	■		■	■	■	
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2N2904AJXV	■		■	■	■	
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2N2905JTX	■		■	■	■	
2N2905JXV	■		■	■	■	
2N2905AJAN	■		■	■	■	
2N2905AJTX	■		■	■	■	
2N2905AJXV	■		■	■	■	
2N2906JAN	■		■	■	■	
2N2906JTX	■		■	■	■	
2N2906JXV	■		■	■	■	
2N2906AJAN	■		■	■	■	
2N2906AJTX	■		■	■	■	
2N2906AJXV	■		■	■	■	
2N2907JAN	■		■	■	■	
2N2907JTX	■		■	■	■	
2N2907JXV	■		■	■	■	
2N2907AJAN	■		■	■	■	
2N2907AJTX	■		■	■	■	
2N2907AJXV	■		■	■	■	
2N2919JAN	■		■			
2N2919JTX	■		■			
2N2919JXV	■		■			

QPL Cross Reference Chart

Part Number	Raytheon	Crystalonics	Fairchild	Motorola	Texas Inst.	Other
2N2920JAN	■		■			
2N2920JTX	■		■			
2N2920JXV	■		■			
2N2945AJAN	■	■			■	
2N2945AJTX	■	■			■	
2N2945AJXV	■	■			■	
2N2946AJAN	■	■			■	
2N2946AJTX	■	■			■	
2N2946AJXV	■	■			■	
2N3019JAN	■		■	■		
2N3019JTX	■		■	■		
2N3019JXV	■		■	■		
2N3057AJAN	■		■			
2N3057AJTX	■		■			
2N3057AJXV	■		■			
2N3250AJAN	■		■	■		
2N3250AJTX	■		■	■		
2N3250AJXV	■		■	■		
2N3251AJAN	■		■	■		
2N3251AJTX	■		■	■		
2N3251AJXV	■		■	■		
2N3467JAN	■			■	■	
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2N3467JXV	■			■	■	
2N3468JAN	■			■		
2N3468JTX	■			■		
2N3468JXV	■			■		
2N3485AJAN	■			■		
2N3485AJTX	■			■		
2N3486AJAN	■			■		
2N3486AJTX	■			■		
2N3498JAN	■	■		■		
2N3498JTX	■	■		■		
2N3498JXV	■	■		■		
2N3499JAN	■	■		■		
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2N3635JTX	■	■		■		
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2N3636JAN	■	■		■		
2N3636JTX	■	■		■		
2N3636JXV	■	■		■		
2N3637JAN	■	■		■		
2N3637JTX	■	■		■		
2N3637JXV	■	■		■		
2N3700JAN	■		■	■		

Part Number	Raytheon	Crystalonics	Fairchild	Motorola	Texas Inst.	Other
2N3700JTX	■		■	■		
2N3700JXV	■		■	■		
2N3735JAN	■			■		
2N3735JTX	■			■		
2N3735JXV	■			■		
2N3737JAN	■			■		
2N3737JTX	■			■		
2N3737JXV	■			■		
2N3762JAN	■			■		
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2N3763JAN	■			■		
2N3763JTX	■			■		
2N3763JXV	■			■		
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2N3838JTX	■					
2N3838JXV	■					
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2N3866JTX	■			■		
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2N3866AJTX	■			■		
2N3866AJXV	■			■		
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2N4261JTX	■			■		
2N4261JXV	■					
2N4856JAN	■			■	■	*
2N4856JTX	■			■	■	*
2N4856JXV	■			■	■	*
2N4857JAN	■			■	■	*
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2N4858JXV	■			■	■	*
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2N4859JXV	■			■	■	*
2N4860JAN	■			■	■	*
2N4860JTX	■			■	■	*
2N4860JXV	■			■	■	*
2N4861JAN	■			■	■	*
2N4861JTX	■			■	■	*
2N4861JXV	■			■	■	*
2N5793JAN	■			■		
2N5793JTX	■			■		
2N5793JXV	■			■		
2N5794JAN	■			■		
2N5794JTX	■			■		
2N5794JXV	■			■		
2N5795JAN	■			■		
2N5795JTX	■			■		
2N5795JXV	■			■		
2N5796JAN	■			■		
2N5796JTX	■			■		
2N5796JXV	■			■		

*Intersil, Siliconix, Solitron, Teledyne

Small Signal Transistors

Part Number	Die	PKG	Description
2N327A	GY	T039	PNP Chopper
2N327B	GY	T039	PNP Chopper
2N328A	GY	T039	PNP Chopper
2N328AJ	GY	T039	PNP Chopper
2N328B	GY	T039	PNP Chopper
2N329A	GY	T039	PNP Chopper
2N329AJ	GY	T039	PNP Chopper
2N329B	GY	T039	PNP Chopper
2N497	CG	T039	NPN G. P. Amplifier
2N497J	CG	T039	NPN G. P. Amplifier
2N498	CG	T039	NPN G. P. Amplifier
2N498J	CR	T039	NPN G. P. Amplifier
2N656	CG	T039	NPN G. P. Amplifier
2N656J	CR	T039	NPN G. P. Amplifier
2N657	CG	T039	NPN G. P. Amplifier
2N657J	CR	T039	NPN G. P. Amplifier
2N696	CG	T039	NPN G. P. Amplifier
2N696J	CR	T039	NPN G. P. Amplifier
2N697	CG	T039	NPN G. P. Amplifier
2N697J	CR	T039	NPN G. P. Amplifier
2N697A	CG	T039	NPN G. P. Amplifier
2N698	CG	T039	NPN G. P. Amplifier
2N699	CG	T039	NPN G. P. Amplifier
2N699A	CG	T039	NPN G. P. Amplifier
2N699B	CG	T039	NPN G. P. Amplifier
2N706	CJ	T018	NPN Logic Switch
2N706J	CJ	T018	NPN Logic Switch
2N706A	CJ	T018	NPN Logic Switch
2N706B	CJ	T018	NPN Logic Switch
2N706C	CJ	T018	NPN Logic Switch
2N708*	CJ	T018	NPN Logic Switch
2N717	CG	T018	NPN G. P. Amplifier
2N718	CG	T018	NPN G. P. Amplifier
2N718A	CG	T018	NPN G. P. Amplifier
2N718AJ	CG	T018	NPN G. P. Amplifier
2N718AJTX	CG	T018	NPN G. P. Amplifier
2N718AJXV	CG	T018	NPN G. P. Amplifier
2N719	CG	T018	NPN G. P. Amplifier
2N720	CG	T018	NPN G. P. Amplifier
2N720A	CG	T018	NPN G. P. Amplifier

Part Number	Die	PKG	Description
2N720AJ	CR	T018	NPN G. P. Amplifier
2N720AJTX	CR	T018	NPN G. P. Amplifier
2N721	GB	T018	PNP G. P. Amplifier
2N721A	GB	T018	PNP MC/HS Amplifier
2N722	GB	T018	PNP G. P. Amplifier
2N722A	GB	T018	PNP MC/HS Amplifier
2N730	CG	T018	NPN G. P. Amplifier
2N731	CG	T018	NPN G. P. Amplifier
2N743	CJ	T018	NPN Logic Switch
2N743A	CJ	T018	NPN Logic Switch
2N744	CJ	T018	NPN Logic Switch
2N744JAN	CJ	T018	NPN Logic Switch
2N744A	CJ	T018	NPN Logic Switch
2N757A	CL	T018	NPN LL Amplifier
2N757AJ	CL	T018	NPN LL Amplifier
2N759A	CL	T018	NPN LL Amplifier
2N759AJ	CL	T018	NPN LL Amplifier
2N760	CL	T018	NPN LL Amplifier
2N760A	CL	T018	NPN LL Amplifier
2N760AJ	CL	T018	NPN LL Amplifier
2N783	CJ	T018	NPN Logic Switch
2N784	CJ	T018	NPN Logic Switch
2N784A	CJ	T018	NPN Logic Switch
2N834	CJ	T018	NPN Logic Switch
2N834A	CJ	T018	NPN Logic Switch
2N835	CJ	T018	NPN Logic Switch
2N870	CG	T018	NPN G. P. Amplifier
2N871	CG	T018	NPN G. P. Amplifier
2N910	CG	T018	NPN G. P. Amplifier
2N910J	CG	T018	NPN G. P. Amplifier
2N910JTX	CG	T018	NPN G. P. Amplifier
2N911	CG	T018	NPN G. P. Amplifier
2N911J	CG	T018	NPN G. P. Amplifier
2N911JTX	CG	T018	NPN G. P. Amplifier
2N912	CG	T018	NPN G. P. Amplifier
2N912J	CG	T018	NPN G. P. Amplifier
2N912JTX	CG	T018	NPN G. P. Amplifier
2N915	CZ	T018	NPN RF Amplifier
2N916	CZ	T018	NPN RF Amplifier
2N916J	CZ	T018	NPN RF Amplifier

*Available as a beam leaded device in chip form only.

Part Number	Die	PKG	Description
2N916A	CZ	T018	NPN RF Amplifier
2N917	CV	T072	NPN UHF Amplifier
2N917A	CV	T072	NPN UHF Amplifier
2N918*	CV	T072	NPN UHF Amplifier
2N918J	CV	T072	NPN UHF Amplifier
2N918JTX	CV	T072	NPN UHF Amplifier
2N918JXV	CV	T072	NPN UHF Amplifier
2N929*	CL	T018	NPN LL Amplifier
2N929J	CL	T018	NPN LL Amplifier
2N929JTX	CL	T018	NPN LL Amplifier
2N929A	CL	T018	NPN LL Amplifier
2N930*	CL	T018	NPN LL Amplifier
2N930J	CL	T018	NPN LL Amplifier
2N930JTX	CL	T018	NPN LL Amplifier
2N930A	CL	T018	NPN LL Amplifier
2N930B	CL	T018	NPN LL Amplifier
2N943	GY	T018	PNP Chopper
2N944	GY	T018	PNP Chopper
2N956	CG	T018	NPN G. P. Amplifier
2N957	CZ	T018	NPN RF Amplifier
2N997	LC	T018	NPN Darlington Amplifier
2N998	LC	T072	NPN Darlington Amplifier
2N999	LC	T072	NPN Darlington Amplifier
2N1024	GY	T039	PNP Chopper
2N1025	GY	T039	PNP Chopper
2N1026	GY	T039	PNP Chopper
2N1131	GB	T039	PNP G. P. Amplifier
2N1131J	GB	T039	PNP G. P. Amplifier
2N1132	GB	T039	PNP G. P. Amplifier
2N1132J	GB	T039	PNP G. P. Amplifier
2N1132A	GB	T039	PNP MC/HS Amplifier
2N1132B	GB	T039	PNP MC/HS Amplifier
2N1219	GY	T039	PNP Chopper
2N1220	GY	T039	PNP Chopper
2N1420	CG	T039	NPN G. P. Amplifier
2N1507	CG	T039	NPN G. P. Amplifier
2N1613	CG	T039	NPN G. P. Amplifier
2N1613J	CG	T039	NPN G. P. Amplifier
2N1613JTX	CG	T039	NPN G. P. Amplifier
2N1613JXV	CG	T039	NPN G. P. Amplifier

Part Number	Die	PKG	Description
2N1613A	CG	T039	NPN G. P. Amplifier
2N1613B	CG	T039	NPN G. P. Amplifier
2N1711	CG	T039	NPN G. P. Amplifier
2N1711J	CR	T039	NPN G. P. Amplfier
2N1711JTX	CR	T039	NPN G. P. Amplifier
2N1711A	CG	T039	NPN G. P. Amplifier
2N1711B	CG	T039	NPN G. P. Amplifier
2N1889	CG	T039	NPN G. P. Amplifier
2N1890	CG	T039	NPN G. P. Amplifier
2N1890J	CR	T039	NPN G. P. Amplifier
2N1890JTX	CR	T039	NPN G. P. Amplifier
2N1893	CG	T039	NPN G. P. Amplifier
2N1893J	CR	T039	NPN G. P. Amplifier
2N1893JTX	CR	T039	NPN G. P. Amplifier
2N1893A	CG	T039	NPN G. P. Amplifier
2N1973	CG	T039	NPN G. P. Amplifier
2N1974	CG	T039	NPN G. P. Amplifier
2N1975	CG	T039	NPN G. P. Amplifier
2N1986	CG	T039	NPN G. P. Amplifier
2N1987	CG	T039	NPN G. P. Amplifier
2N1988	CG	T039	NPN G. P. Amplifier
2N1989	CG	T039	NPN G. P. Amplifier
2N1990	CG	T039	NPN G. P. Amplifier
2N2003	GY	T039	PNP Chopper
2N2004	GY	T039	PNP Chopper
2N2005	GY	T039	PNP Chopper
2N2060	CG(2)	T077	NPN Diff. Amplifier
2N2060J	CG(2)	T077	NPN Diff. Amplifier
2N2060JTX	CG(2)	T077	NPN Diff. Amplifier
2N2060JXV	CG(2)	T077	NPN Diff. Amplifier
2N2060A	CG(2)	T077	NPN Diff. Amplifier
2N2060B	CG(2)	T077	NPN Diff. Amplifier
2N2102	CG	T039	NPN G. P. Amplifier
2N2102A	CG	T039	NPN G. P. Amplifier
2N2175	GY	T039	PNP Chopper
2N2176	GY	T018	PNP Chopper
2N2177	GY	T039	PNP Chopper
2N2178	GY	T018	PNP Chopper
2N2192	CG	T039	NPN G. P. Amplifier
2N2192A	CG	T039	NPN G. P. Amplifier

*Available as a beam leaded device in chip form only.

Small Signal Transistors

Part Number	Die	PKG	Description
2N2192B	CG	T039	NPN G. P. Amplifier
2N2193	CG	T039	NPN G. P. Amplifier
2N2193A	CG	T039	NPN G. P. Amplifier
2N2193B	CG	T039	NPN G. P. Amplifier
2N2194	CG	T039	NPN G. P. Amplifier
2N2194A	CG	T039	NPN G. P. Amplifier
2N2194B	CG	T039	NPN G. P. Amplifier
2N2195	CG	T039	NPN G. P. Amplifier
2N2195A	CG	T039	NPN G. P. Amplifier
2N2195B	CG	T039	NPN G. P. Amplifier
2N2205	CJ	T018	NPN UHS Logic Switch
2N2217	CB	T039	NPN MC/HS Amplifier
2N2218	CB	T039	NPN MC/HS Amplifier
2N2218J	CB	T039	NPN MC/HS Amplifier
2N2218JTX	CB	T039	NPN MC/HS Amplifier
2N2218JXV	CB	T039	NPN MC/HS Amplifier
2N2218A	CB	T039	NPN MC/HS Amplifier
2N2218AJ	CB	T039	NPN MC/HS Amplifier
2N2218AJTX	CB	T039	NPN MC/HS Amplifier
2N2218AJXV	CB	T039	NPN MC/HS Amplifier
2N2219	CB	T039	NPN MC/HS Amplifier
2N2219J	CB	T039	NPN MC/HS Amplifier
2N2219JTX	CB	T039	NPN MC/HS Amplifier
2N2219JXV	CB	T039	NPN MC/HS Amplifier
2N2219A	CB	T039	NPN MC/HS Amplifier
2N2219AJ	CB	T039	NPN MC/HS Amplifier
2N2219AJTX	CB	T039	NPN MC/HS Amplifier
2N2219AJXV	CB	T039	NPN MC/HS Amplifier
2N2220	CB	T018	NPN MC/HS Amplifier
2N2221	CB	T018	NPN MC/HS Amplifier
2N2221J	CB	T018	NPN MC/HS Amplifier
2N2221JTX	CB	T018	NPN MC/HS Amplifier
2N2221JXV	CB	T018	NPN MC/HS Amplifier
2N2221A	CB	T018	NPN MC/HS Amplifier
2N2221AJ	CB	T018	NPN MC/HS Amplifier
2N2221AJTX	CB	T018	NPN MC/HS Amplifier
2N2221AJXV	CB	T018	NPN MC/HS Amplifier
2N2222*	CB	T018	NPN MC/HS Amplifier
2N2222J	CB	T018	NPN MC/HS Amplifier
2N2222JTX	CB	T018	NPN MC/HS Amplifier
2N2222JXV	CB	T018	NPN MC/HS Amplifier
2N2222A*	CB	T018	NPN MC/HS Amplifier
2N2222AJ	CB	T018	NPN MC/HS Amplifier
2N2222AJTX	CB	T018	NPN MC/HS Amplifier
2N2222AJXV	CB	T018	NPN MC/HS Amplifier
2N2223	CG	T077	NPN Diff. Amplifier
2N2223A	CG	T077	NPN Diff. Amplifier
2N2236	CB	T039	NPN G. P. Amplifier
2N2237	CB	T039	NPN G. P. Amplifier
2N2243	CG	T039	NPN G. P. Amplifier
2N2243A	CG	T039	NPN G. P. Amplifier
2N2270	CG	T039	NPN G. P. Amplifier
2N2280	CY	T018	PNP Chopper
2N2297	CG	T039	NPN G. P. Amplifier
2N2303	GB	T039	PNP G. P. Amplifier
2N2309	CG	T039	NPN G. P. Amplifier
2N2310	CG	T046	NPN G. P. Amplifier
2N2350	CG	T046	NPN G. P. Amplifier
2N2350A	CG	T046	NPN G. P. Amplifier
2N2351	CG	T046	NPN G. P. Amplifier
2N2351A	CG	T046	NPN G. P. Amplifier
2N2352	CG	T046	NPN G. P. Amplifier
2N2352A	CG	T046	NPN G. P. Amplifier
2N2353	CG	T046	NPN G. P. Amplifier
2N2353A	CG	T046	NPN G. P. Amplifier
2N2368	CJ	T018	NPN UHS Logic Switch
2N2369	CJ	T018	NPN UHS Logic Switch
2N2369A*	CJ	T018	NPN UHS Logic Switch
2N2369AJ	CJ	T018	NPN UHS Logic Switch
2N2369AJTX	CJ	T018	NPN UHS Logic Switch
2N2369AJXV	CJ	T018	NPN UHS Logic Switch
2N2405	CG	T039	NPN G. P. Amplifier
2N2453	CL	T077	NPN Diff. Amplifier
2N2453A	CL	T077	NPN Diff. Amplifier
2N2480	CG	T077	NPN Diff. Amplifier
2N2480A	CG	T077	NPN Diff. Amplifier
2N2481	CJ	T018	NPN UHS Logic Switch
2N2481J	CJ	T018	NPN UHS Logic Switch
2N2481JTX	CJ	T018	NPN UHS Logic Switch
2N2483*	CL	T018	NPN LL Amplifier

*Available as a beam leaded device in chip form only.

Part Number	Die	PKG	Description
2N2484*	CL	T018	NPN LL Amplifier
2N2484J	CL	T018	NPN LL Amplifier
2N2484JTX	CL	T018	NPN LL Amplifier
2N2484JXV	CL	T018	NPN LL Amplifier
2N2484A	CL	T018	NPN LL Amplifier
2N2586	CL	T018	NPN LL Amplifier
2N2604*	GL	T046	PNP LL Amplifier
2N2604J	GL	T046	PNP LL Amplifier
2N2604JTX	GL	T046	PNP LL Amplifier
2N2604JXV	GL	T046	PNP LL Amplifier
2N2605*	GL	T046	PNP LL Amplifier
2N2605J	GL	T046	PNP LL Amplifier
2N2605JTX	GL	T046	PNP LL Amplifier
2N2605JXV	GL	T046	PNP LL Amplifier
2N2609	2B	T018	P-Channel Fet
2N2609JAN	2B	T018	P-Channel Fet
2N2639	CL	T077	NPN Diff. Amplifier
2N2640	CL	T077	NPN Diff. Amplifier
2N2641	CL	T077	NPN Diff. Amplifier
2N2642	CL	T077	NPN Diff. Amplifier
2N2643	CL	T077	NPN Diff. Amplifier
2N2644	CL	T077	NPN Diff. Amplifier
2N2708*	CV	T072	NPN UHF Amplifier
2N2723	LC	T072	NPN Darlington Amplifier
2N2724	LC	T072	NPN Darlington Amplifier
2N2725	LC	T072	NPN Darlington Amplifier
2N2785	LC	T072	NPN Darlington Amplifier
2N2894	GJ	T018	PNP UHS Logic Switch
2N2894A	GR	T018	PNP UHS Logic Switch
2N2904	GB	T039	PNP MC/HS Amplifier
2N2904J	GB	T039	PNP MC/HS Amplifier
2N2904JTX	GB	T039	PNP MC/HS Amplifier
2N2904JXV	GB	T039	PNP MC/HS Amplifier
2N2904A	GB	T039	PNP MC/HS Amplifier
2N2904AJ	GB	T039	PNP MC/HS Amplifier
2N2904AJTX	GB	T039	PNP MC/HS Amplifier
2N2904AJXV	GB	T039	PNP MC/HS Amplifier
2N2905	GB	T039	PNP MC/HS Amplfier
2N2905J	GB	T039	PNP MC/HS Amplifier
2N2905JTX	GB	T039	PNP MC/HS Amplifier
2N2905JXV	GB	T039	PNP MC/HS Amplifier
2N2905A	GB	T039	PNP MC/HS Amplifier
2N2905AJ	GB	T039	PNP MC/HS Amplifier
2N2905AJTX	GB	T039	PNP MC/HS Amplifier
2N2905AJXV	GB	T039	PNP MC/HS Amplifier
2N2906	GB	T018	PNP MC/HS Amplifier
2N2906J	GB	T018	PNP MC/HS Amplifier
2N2906JTX	GB	T018	PNP MC/HS Amplifier
2N2906JXV	GB	T018	PNP MC/HS Amplifier
2N2906A	GB	T018	PNP MC/HS Amplifier
2N2906AJ	GB	T018	PNP MC/HS Amplifier
2N2906AJTX	GB	T018	PNP MC/HS Amplifier
2N2906AJXV	GB	T018	PNP MC/HS Amplifier
2N2907*	GB	T018	PNP MC/HS Amplifier
2N2907J	GB	T018	PNP MC/HS Amplifier
2N2907JTX	GB	T018	PNP MC/HS Amplifier
2N2907JXV	GB	T018	PNP MC/HS Amplifier
2N2907A*	GB	T018	PNP MC/HS Amplifier
2N2907AJ	GB	T018	PNP MC/HS Amplifier
2N2907AJTX	GB	T018	PNP MC/HS Amplifier
2N2907AJXV	GB	T018	PNP MC/HS Amplifier
2N2913	CL	T077	NPN Diff. Amplifier
2N2914	CL	T077	NPN Diff. Amplifier
2N2915	CL	T077	NPN Diff. Amplifier
2N2915A	CL	T077	NPN Diff. Amplifier
2N2916	CL	T077	NPN Diff. Amplifier
2N2916A	CL	T077	NPN Diff. Amplifier
2N2917	CL	T077	NPN Diff. Amplifier
2N2918	CL	T077	NPN Diff. Amplifier
2N2919	CL	T077	NPN Diff. Amplifier
2N2919A	CL	T077	NPN Diff. Amplifier
2N2919J	CL	T077	NPN Diff. Amplifier
2N2919JTX	CL	T077	NPN Diff. Amplifier
2N2919JXV	CL	T077	NPN Diff. Amplifier
2N2920	CL	T077	NPN Diff. Amplifier
2N2920J	CL	T077	NPN Diff. Amplifier
2N2920JTX	CL	T077	NPN Diff. Amplifier
2N2920JXV	CL	T077	NPN Diff. Amplifier
2N2920A	CL	T077	NPN Diff. Amplifier
2N2936	CL	T077	NPN Diff. Amplifier

*Available as a beam leaded device in chip form only.

Small Signal Transistors

Part Number	Die	PKG	Description
2N2945	GY	T046	PNP Chopper
2N2945A	GY	T046	PNP Chopper
2N2945AJ	GY	T046	PNP Chopper
2N2945AJTX	GY	T046	PNP Chopper
2N2945AJXV	GY	T046	PNP Chopper
2N2946*	GY	T046	PNP Chopper
2N2946A	GY	T046	PNP Chopper
2N2946AJ	GY	T046	PNP Chopper
2N2946AJTX	GY	T046	PNP Chopper
2N2946AJXV	GY	T046	PNP Chopper
2N2972	CL	T071	NPN Diff. Amplifier
2N2973	CL	T071	NPN Diff. Amplifier
2N2974	CL	T071	NPN Diff. Amplifier
2N2975	CL	T071	NPN Diff. Amplifier
2N2976	CL	T071	NPN Diff. Amplifier
2N2977	CL	T071	NPN Diff. Amplifier
2N2978	CL	T071	NPN Diff. Amplifier
2N2979	CL	T071	NPN Diff. Amplifier
2N3011	CJ	T018	NPN UHS Logic Switch
2N3012	GJ	T018	PNP UHS Logic Switch
2N3019	CG	T039	NPN G. P. Amplifier
2N3019J	CG	T039	NPN G. P. Amplifier
2N3019JTX	CG	T039	NPN G. P. Amplifier
2N3019JXV	CG	T039	NPN G. P. Amplifier
2N3020	CG	T039	NPN G. P. Amplifier
2N3036	CG	T039	NPN G. P. Amplifier
2N3043	CL	T089	NPN Diff. Amplifier
2N3044	CL	T089	NPN Diff. Amplifier
2N3045	CL	T089	NPN Diff. Amplifier
2N3046	CL	T089	NPN Diff. Amplifier
2N3047	CL	T089	NPN Diff. Amplifier
2N3048	CL	T089	NPN Diff. Amplifier
2N3053	CG	T039	NPN G. P. Amplifier
2N3056	CG	T046	NPN G. P. Amplifier
2N3056A	CG	T046	NPN G. P. Amplifier
2N3057	CG	T046	NPN G. P. Amplifier
2N3057A	CG	T046	NPN G. P. Amplifier
2N3057AJ	CG	T046	NPN G. P. Amplifier
2N3057AJTX	CG	T046	NPN G. P. Amplifier
2N3057AJXV	CG	T046	NPN G. P. Amplifier

Part Number	Die	PKG	Description
2N3115	CB	T018	NPN MC/HS Amplifier
2N3116	CB	T018	NPN MC/HS Amplifier
2N3117	CL	T018	NPN LL Amplifier
2N3120	GB	T039	PNP MC/HS Amplifier
2N3121	GB	T018	PNP MC/HS Amplifier
2N3122	CG	T039	NPN G. P. Amplifier
2N3133	GB	T039	PNP MC/HS Amplifier
2N3134	GB	T039	PNP MC/HS Amplifier
2N3135	GB	T018	PNP MC/HS Amplifier
2N3136	GB	T018	PNP MC/HS Amplifier
2N3209	GJ	T018	PNP UHS Logic Switch
2N3210	CJ	T018	NPN UHS Logic Switch
2N3217	GY	T046	PNP Chopper
2N3218	GY	T046	PNP Chopper
2N3219	GY	T046	PNP Chopper
2N3244	GK	T039	PNP Core Driver
2N3245	GK	T039	PNP Core Driver
2N3250	GA	T018	PNP MC/HS Amplifier
2N3250A*	GA	T018	PNP MC/HS Amplifier
2N3250AJ	GA	T018	PNP MC/HS Amplifier
2N3250AJTX	GA	T018	PNP MC/HS Amplifier
2N3250AJXV	GA	T018	PNP MC/HS Amplifier
2N3251	GA	T018	PNP MC/HS Amplifier
2N3251A	GA	T018	PNP MC/HS Amplifier
2N3251AJ	GA	T018	PNP MC/HS Amplifier
2N3251AJTX	GA	T018	PNP MC/HS Amplifier
2N3251AJXV	GA	T018	PNP MC/HS Amplifier
2N3252	CK	T039	NPN Core Driver
2N3253	CK	T039	NPN Core Driver
2N3347	GL	T077	PNP Diff. Amplifier
2N3348	GL	T077	PNP Diff. Amplifier
2N3349	GL	T077	PNP Diff. Amplifier
2N3350	GL	T077	PNP Diff. Amplifier
2N3351	GL	T077	PNP Diff. Amplifier
2N3352	GL	T077	PNP Diff. Amplifier
2N3423	CV	T077	NPN Diff. Amplifier
2N3424	CV	T077	NPN Diff. Amplifier
2N3444	CK	T039	NPN Core Driver
2N3467	GK	T039	PNP Core Driver
2N3467J	GK	T039	PNP Core Driver

*Available as a beam leaded device in chip form only.

Part Number	Die	PKG	Description
2N3467JTX	GK	T039	PNP Core Driver
2N3467JXV	GK	T039	PNP Core Driver
2N3468	GK	T039	PNP Core Driver
2N3468J	GK	T039	PNP Core Driver
2N3468JTX	GK	T039	PNP Core Driver
2N3468JXV	GK	T039	PNP Core Driver
2N3485	GB	T046	PNP MC/HS Amplifier
2N3485A	GB	T046	PNP MC/HS Amplifier
2N3485AJ	GB	T046	PNP MC/HS Amplifier
2N3485AJTX	GB	T046	PNP MC/HS Amplifier
2N3486	GB	T046	PNP MC/HS Amplifier
2N3486A	GB	T046	PNP MC/HS Amplifier
2N3486AJ	GB	T046	PNP MC/HS Amplifier
2N3486AJTX	GB	T046	PNP MC/HS Amplifier
2N3498	CC	T039	NPN High Voltage Amplifier
2N3498J	CC	T039	NPN High Voltage Amplifier
2N3498JTX	CC	T039	NPN High Voltage Amplifier
2N3498JXV	CC	T039	NPN High Voltage Amplifier
2N3499	CC	T039	NPN High Voltage Amplifier
2N3499J	CC	T039	NPN High Voltage Amplifier
2N3499JTX	CC	T039	NPN High Voltage Amplifier
2N3499JXV	CC	T039	NPN High Voltage Amplifier
2N3500	CC	T039	NPN High Voltage Amplifier
2N3500J	CC	T039	NPN High Voltage Amplifier
2N3500JTX	CC	T039	NPN High Voltage Amplifier
2N3500JXV	CC	T039	NPN High Voltage Amplifier
2N3501*	CC	T039	NPN High Voltage Amplifier
2N3501J	CC	T039	NPN High Voltage Amplifier
2N3501JTX	CC	T039	NPN High Voltage Amplifier
2N3501JXV	CC	T039	NPN High Voltage Amplifier
2N3502	GB	T039	PNP MC/HS Amplifier
2N3503	GB	T039	PNP MC/HS Amplifier
2N3504	GB	T018	PNP MC/HS Amplifier
2N3505	GB	T018	PNP MC/HS Amplifier
2N3545	GJ	T018	PNP UHS Logic Switch
2N3554	CK	T039	NPN Core Driver
2N3634	GC	T039	PNP High Voltage Amplifier
2N3634J	GC	T039	PNP High Voltage Amplifier
2N3634JTX	GC	T039	PNP High Voltage Amplifier
2N3634JXV	GC	T039	PNP High Voltage Amplifier
2N3635*	GC	T039	PNP High Voltage Amplifier
2N3635J	GC	T039	PNP High Voltage Amplifier
2N3635JTX	GC	T039	PNP High Voltage Amplifier
2N3635JXV	GC	T039	PNP High Voltage Amplifier
2N3636	GC	T039	PNP High Voltage Amplifier
2N3636J	GC	T039	PNP High Voltage Amplifier
2N3636JTX	GC	T039	PNP High Voltage Amplifier
2N3636JXV	GC	T039	PNP High Voltage Amplifier
2N3637	GC	T039	PNP High Voltage Amplifier
2N3637J	GC	T039	PNP High Voltage Amplifier
2N3637JTX	GC	T039	PNP High Voltage Amplifier
2N3637JXV	GC	T039	PNP High Voltage Amplifier
2N3671	GB	T039	PNP MC/HS Amplifier
2N3672	GB	T018	PNP MC/HS Amplifier
2N3673	GB	T046	PNP MC/HS Amplifier
2N3700*	CG	T018	NPN G. P. Amplifier
2N3700J	CG	T018	NPN G. P. Amplifier
2N3700JTX	CG	T018	NPN G. P. Amplifier
2N3700JXV	CG	T018	NPN G. P. Amplifier
2N3701	CG	T018	NPN G. P. Amplifier
2N3722	CK	T039	NPN Core Driver
2N3724	CK	T039	NPN Core Driver
2N3724A	CK	T039	NPN Core Driver
2N3725*	CK	T039	NPN Core Driver
2N3725A	CK	T039	NPN Core Driver
2N3726	GB	T078	PNP Diff. Amplifier
2N3727	GB	T078	PNP Diff. Amplifier
2N3734	CK	T039	NPN Core Driver
2N3735	CK	T039	NPN Core Driver
2N3735J	CK	T039	NPN Core Driver
2N3735JTX	CK	T039	NPN Core Driver
2N3735JXV	CK	T039	NPN Core Driver
2N3736	CK	T046	NPN Core Driver
2N3737	CK	T046	NPN Core Driver
2N3737J	CK	T046	NPN Core Driver
2N3737JTX	CK	T046	NPN Core Driver
2N3737JXV	CK	T046	NPN Core Driver
2N3762	GK	T039	PNP Core Driver
2N3762J	GK	T039	PNP Core Driver
2N3762JTX	GK	T039	PNP Core Driver

*Available as a beam leaded device in chip form only.

Small Signal Transistors

Part Number	Die	PKG	Description
2N3762JXV	GK	T039	PNP Core Driver
2N3763	GK	T039	PNP Core Driver
2N3763J	GK	T039	PNP Core Driver
2N3763JTX	GK	T039	PNP Core Driver
2N3763JXV	GK	T039	PNP Core Driver
2N3764	GK	T046	PNP Core Driver
2N3765	GK	T046	PNP Core Driver
2N3799	GL	T018	PNP LL Amplifier
2N3800	GL	T071	PNP Diff. Amplifier
2N3801	GL	T071	PNP Diff. Amplifier
2N3802	GL	T071	PNP Diff. Amplifier
2N3803	GL	T071	PNP Diff. Amplifier
2N3804	GL	T071	PNP Diff. Amplifier
2N3804A	GL	T071	PNP Diff. Amplifier
2N3805	GL	T071	PNP Diff. Amplifier
2N3805A	GL	T071	PNP Diff. Amplifier
2N3806	GL	T078	PNP Diff. Amplifier
2N3807	GL	T078	PNP Diff. Amplifier
2N3808	GL	T078	PNP Diff. Amplifier
2N3809	GL	T078	PNP Diff. Amplifier
2N3810	GL	T078	PNP Diff. Amplifier
2N3810A	GL	T078	PNP Diff. Amplifier
2N3811	GL	T078	PNP Diff. Amplifier
2N3811A	GL	T078	PNP Diff. Amplifier
2N3812	GL	T089	PNP Diff. Amplifier
2N3813	GL	T089	PNP Diff. Amplifier
2N3814	GL	T089	PNP Diff. Amplifier
2N3815	GL	T089	PNP Diff. Amplifier
2N3816	GL	T089	PNP Diff. Amplifier
2N3816A	GL	T089	PNP Diff. Amplifier
2N3817	GL	T089	PNP Diff. Amplifier
2N3817A	GL	T089	PNP Diff. Amplifier
2N3830	CK	T039	NPN Core Driver
2N3831	CK	T039	NPN Core Driver
2N3838	CB/GB	T089	NPN/PNP Compl. Dual
2N3838J	CB/GB	T089	NPN/PNP Compl. Dual
2N3838JTX	CB/GB	T089	NPN/PNP Compl. Dual
2N3838JTXV	CB/GB	T089	NPN/PNP Compl. Dual
2N3866	CQ	T039	NPN UHF Amplifier
2N3866J	CQ	T039	NPN UHF Amplifier

Part Number	Die	PKG	Description
2N3866JTX	CQ	T039	NPN UHF Amplifier
2N3866JXV	CQ	T039	NPN UHF Amplifier
2N3866A	CQ	T039	NPN UHF Amplifier
2N3866AJ	CQ	T039	NPN UHF Amplifier
2N3866AJTX	CQ	T039	NPN UHF Amplifier
2N3866AJXV	CQ	T039	NPN UHF Amplifier
2N3910	GY	T046	PNP Chopper
2N3911	GY	T046	PNP Chopper
2N3913	GY	T018	PNP Chopper
2N3914	GY	T018	PNP Chopper
2N4026	GT	T039	PNP G. P. Amplifier
2N4027	GT	T018	PNP G. P. Amplifier
2N4028	GT	T018	PNP G. P. Amplifier
2N4029	GT	T018	PNP G. P. Amplifier
2N4030	GT	T039	PNP G. P. Amplifier
2N4031	GT	T039	PNP G. P. Amplifier
2N4032	GT	T039	PNP G. P. Amplifier
2N4033	GT	T039	PNP G. P. Amplifier
2N4036	GB	T039	PNP MC/HS Amplifier
2N4037	GB	T039	PNP MC/HS Amplifier
2N4046	CK	T039	NPN Core Driver
2N4047	CK	T039	NPN Core Driver
2N4137	CJ	T018	NPN UHS Logic Switch
2N4208	GR	T018	PNP UHS Logic Switch
2N4209	GR	T018	PNP UHS Logic Switch
2N4260*	GV	T072	PNP UHF Amplifier
2N4261	GV	T072	PNP UHF Amplifier
2N4261J	GV	T072	PNP UHF Amplifier
2N4261JTX	GV	T072	PNP UHF Amplifier
2N4261JXV	GV	T072	PNP UHF Amplifier
2N4449	CJ	T046	NPN UHS Logic Switch
2N4854	CB/GB	T078	NPN/PNP Compl.Dual
2N4855	CB/GB	T078	NPN/PNP Compl. Dual
2N4856*	IA	T018	N-Channel Fet
2N4856J	IA	T018	N-Channel Fet
2N4856JTX	IA	T018	N-Channel Fet
2N4856JXV	IA	T018	N-Channel Fet
2N4857*	IA	T018	N-Channel Fet
2N4857J	IA	T018	N-Channel Fet
2N4857JTX	IA	T018	N-Channel Fet

*Available as a beam leaded device in chip form only.

Part Number	Die	PKG	Description
2N4857JXV	IA	T018	N-Channel Fet
2N4858*	IA	T018	N-Channel Fet
2N4858J	IA	T018	N-Channel Fet
2N4858JTX	IA	T018	N-Channel Fet
2N4858JXV	IA	T018	N-Channel Fet
2N4859	IA	T018	N-Channel Fet
2N4859J	IA	T018	N-Channel Fet
2N4859JTX	IA	T018	N-Channel Fet
2N4859JXV	IA	T018	N-Channel Fet
2N4860	IA	T018	N-Channel Fet
2N4860J	IA	T018	N-Channel Fet
2N4860JTX	IA	T018	N-Channel Fet
2N4860JXV	IA	T018	N-Channel Fet
2N4861	IA	T018	N-Channel Fet
2N4861J	IA	T018	N-Channel Fet
2N4861JTX	IA	T018	N-Channel Fet
2N4861JXV	IA	T018	N-Channel Fet
2N4937	GL	T078	PNP Diff. Amplifier
2N4938	GL	T078	PNP Diff. Amplifier
2N4939	GL	T078	PNP Diff. Amplifier
2N5022	GK	T039	PNP Core Driver
2N5023	GK	T039	PNP Core Driver
2N5793	CB	T078	Dual NPN MC/HS Amplifier
2N5793J	CB	T078	Dual NPN MC/HS Amplifier
2N5793JTX	CB	T078	Dual NPN MC/HS Amplifier
2N5793JXV	CB	T078	Dual NPN MC/HS Amplifier
2N5794	CB	T078	Dual NPN MC/HS Amplifier
2N5794J	CB	T078	Dual NPN MC/HS Amplifier
2N5794JTX	CB	T078	Dual NPN MC/HS Amplifier
2N5794JXV	CB	T078	Dual NPN MC/HS Amplifier
2N5795	GB	T078	Dual NPN MC/HS Amplifier
2N5795J	GB	T078	Dual NPN MC/HS Amplifier
2N5795JTX	GB	T078	Dual NPN MC/HS Amplifier
2N5795JXV	GB	T078	Dual NPN MC/HS Amplifier
2N5796	GB	T078	Dual NPN MC/HS Amplifier
2N5796J	GB	T078	Dual NPN MC/HS Amplifier
2N5796JTX	GB	T078	Dual NPN MC/HS Amplifier
2N5796JXV	GB	T078	Dual NPN MC/HS Amplifier

*Available as a beam leaded device in chip form only.

Beam Lead Diode Chips

Function	Type	Similar EIA Type
High Speed	BD914 B2D914	1N914
	BD4148 B2D4148	1N4148
High Current and Speed	BD3600 B2D3600	1N3600
High Conductance, Low Leakage	BD457 BD458 BD483B	1N457 1N458 1N483B
High Conductance, Low Leakage	BD3595 B2D3595	1N3595
High Power	BD4001	1N4001

Beam Lead Zener Diode Chips

Type	Similar EIA Type	Nominal Zener Voltage
BZ7520	1N752	5.6
BZ752A	1N752A	5.6
BZ755	1N755	7.5
BZ755A	1N755A	7.5
BZ758	1N758	10
BZ758A	1N758A	10
BZ821	1N821	6.2
BZ963	1N963	12
BZ965	1N965	15
BZ969	1N969	22
BZ971	1N971	27
BZ4010 BZ4030	Transient Suppressors	9.5 30

Dual and Quad Small Signal Transistors

Part Number	Die	PKG	Description
SP918QD	CV	116	Quad NPN UHF Amplifier
SP918F	CV	89	Dual NPN UHF Amplifier
SP918QF	CV	86	Quad NPN UHF Amplifier
SP2219AQD	CB	116	Quad NPN MC/HS Amplifier
SP2219AF	CB	89	Dual NPN MC/HS Amplifier
SP2219AQF	CB	86	Quad NPN MC/HS Amplifier
SP2222AQD	CB	116	Quad NPN MC/HS Amplifier
SP2222AF	CB	89	Dual NPN MC/HS Amplifier
SP2222AQDB	CB	116	Quad NPN UHS Logic Switch
SP2222AQF	CB	86	Quad NPN MC/HS Amplifier
SP2369AQD	CJ	116	Quad NPN UHS Logic Switch
SP2369AF	CJ	89	Dual NPN UHS Logic Switch
SP2369AQF	CJ	86	Quad NPN UHS Logic Switch
SP2484QD	CL	116	Quad NPN LL Amplifier
SP2484F	CL	89	Dual NPN LL Amplifier
SP2484QF	CL	86	Quad NPN LL Amplifier
SP2605QD	GL	116	Quad PNP LL Amplifier
SP2605F	GL	89	Dual PNP LL Amplifier
SP2605QF	GL	86	Quad PNP LL Amplifier
SP2905AQD	GB	116	Quad PNP MC/HS Amplifier
SP2905AF	GB	89	Dual PNP MC/HS Amplifier
SP2905AQF	GB	86	Quad PNP MC/HS Amplifier
SP2907AQD	GB	116	Quad PNP MC/HS Amplifier
SP2907AQDB	GB	116	Quad PNP MC/HS Amplifier
SP2907AF	GB	89	Dual PNP MC/HS Amplifier
SP2907AQF	GB	86	Quad PNP MC/HS Amplifier
SP3019QD	CG	116	Quad NPN G. P. Amplifier
SP3019F	CG	89	Dual NPN G. P. Amplifier
SP3019QF	CG	86	Quad NPN G. P. Amplifier
SP3251AQD	GA	116	Quad PNP MC/HS Amplifier
SP3251AF	GA	89	Dual PNP MC/HS Amplifier
SP3251AQF	GA	86	Quad PNP MC/HS Amplifier
SP3467QD	GK	116	Quad PNP Core Driver
SP3467F	GK	89	Dual PNP Core Driver
SP3467QDB	GK	116	Dual PNP Core Driver
SP3467QF	GK	86	Quad PNP Core Driver
SP3724QD	CK	116	Quad NPN Core Driver
SP3724QDB	CK	116	Quad NPN Core Driver
SP3724F	CK	89	Dual NPN Core Driver
SP3724QF	CK	86	Quad NPN Core Driver
SP3725QD	CK	116	Quad NPN Core Driver
SP3725F	CK	89	Dual NPN Core Driver
SP3725QDB	CK	116	Quad NPN Core Driver
SP3725QF	CK	86	Quad NPN Core Driver

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