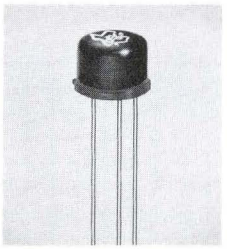
N-P-N GROWN JUNCTION SILICON TRANSISTOR

TYPE 2N333
BULLETIN NO. DL-S 1036, MARCH, 1959
REPLACES BULLETIN NO. DL-S 892, MARCH, 1958



Beta From 18 to 40

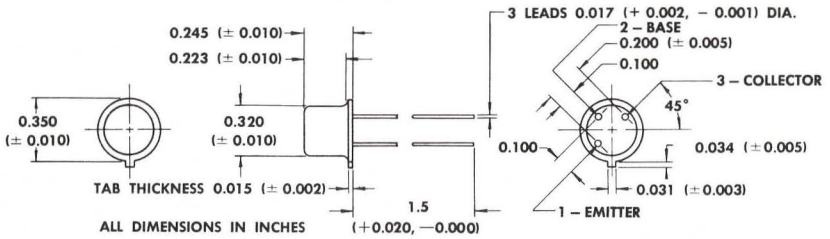
Specifically designed for high gain at high temperatures

qualification testing

All units are heat cycled ten times from −65°C to +175°C. The units are hermetically sealed. All units are completely tested for design characteristics and undergo a rigorous tumble test to check for mechanical reliability. These units are designed to meet the requirements of MIL-T-19500/37.

mechanical data

Welded case with glass-to-metal hermetic seal between case and leads. Unit weight is approximately 1 gram. These units meet JEDEC outline TO-5 and E3-44 base dimensions.



absolute maximum ratings at 25°C ambient [except where advanced temperatures are indicated]

Collector Voltage Referred to Base	45 V
Emitter Voltage Referred to Base	1 V
Collector Current	25 mA
Emitter Current	−25 mA
Device Dissipation }	150 mW
at 100°C }	100 mW
at 150°C }	50 mW

junction temperature

Maximum Range	−65°C to +175°C

common base design characteristics at $T_j = 25°C$ [except where advanced temperatures are indicated]

		test conditions		min.	design center	max.	unit
BV_{CBO}	Collector Breakdown Voltage	$I_C = 50\mu A$	$I_E = 0$	45	—	—	Volt
I_{CBO}	Collector Cutoff Current }	$V_{CB} = 30V$	$I_E = 0$	—	—	2	μA
	at 100° C }	$V_{CB} = 5V$	$I_E = 0$	—	—	10	μA
	at 150° C }	$V_{CB} = 5V$	$I_E = 0$	—	—	50	μA
h_{ib}†	Input Impedance	$V_{CB} = 5V$	$I_E = -1mA$	30	55	80	Ohm
h_{ob}†	Output Admittance	$V_{CB} = 5V$	$I_E = -1mA$	0.0	0.5	1.2	μmho
h_{rb}†	Feedback Voltage Ratio	$V_{CB} = 5V$	$I_E = -1mA$	0.0	370	1000	$X10^{-6}$
h_{fb}†	Current Transfer Ratio	$V_{CB} = 5V$	$I_E = -1mA$	−0.948	−0.96	−0.976	—
NF	Noise Figure*‡	$V_{CE} = 5V$	$I_E = -1mA$	—	20	30	db
$f_{\alpha b}$	Frequency Cutoff	$V_{CB} = 5V$	$I_E = -1mA$	2	8	—	mc
C_{ob}	Output Capacitance (1mc)	$V_{CB} = 5V$	$I_E = -1mA$	—	10	30	$\mu\mu f$
R_{CS}	Saturation Resistance*	$I_B = 2.2mA$	$I_C = 5mA$	—	70	200	Ohm

*Common Emitter †f=1 kc ‡Conventional Noise—Compared to 1000 ohm resistor, 1000 cps and 1 cycle band width

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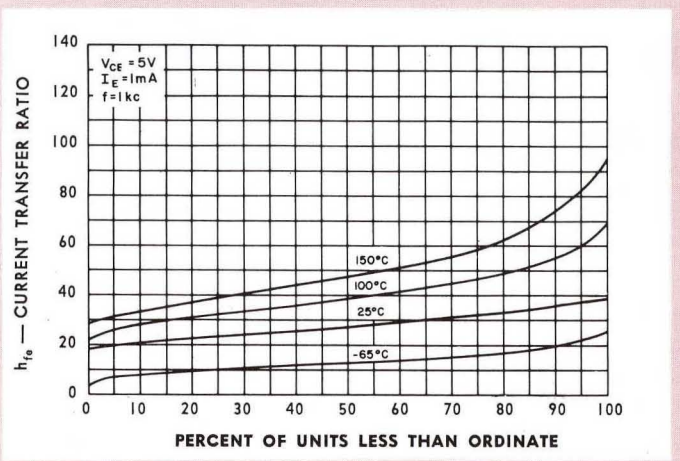
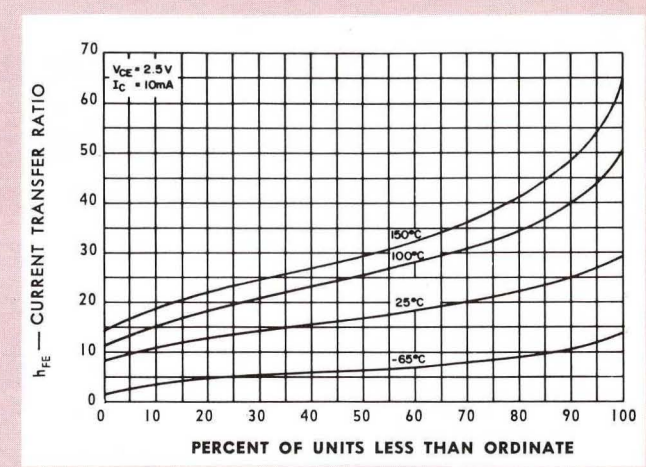
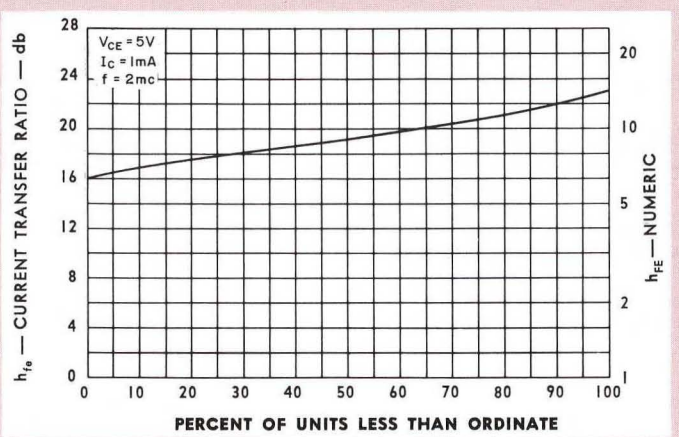
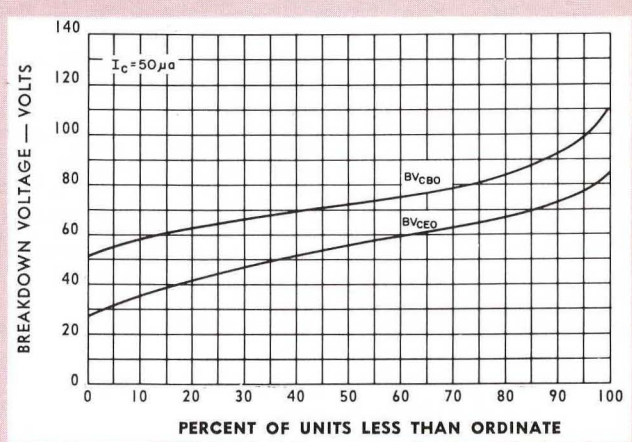
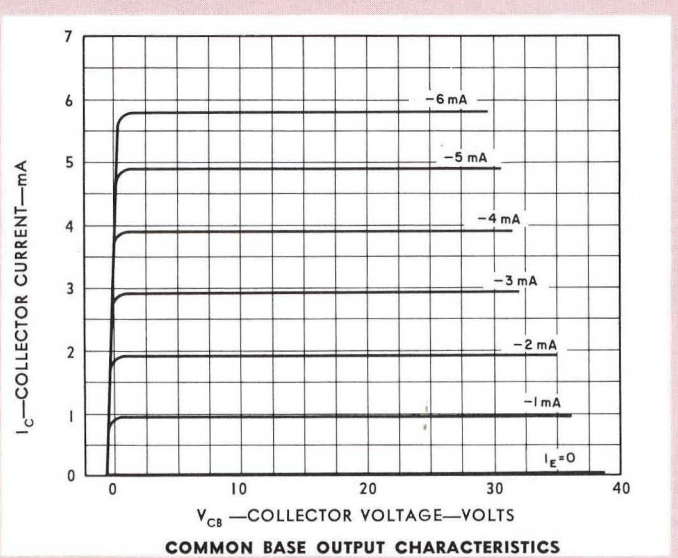
TYPICAL CHARACTERISTICS AND PRODUCTION DISTRIBUTIONS

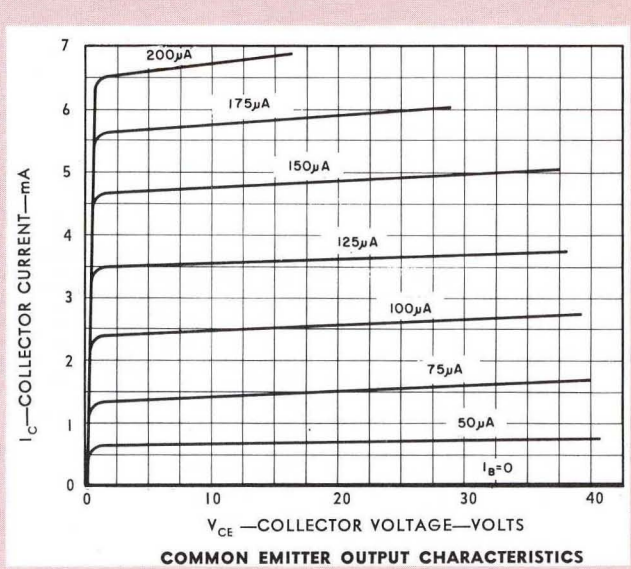












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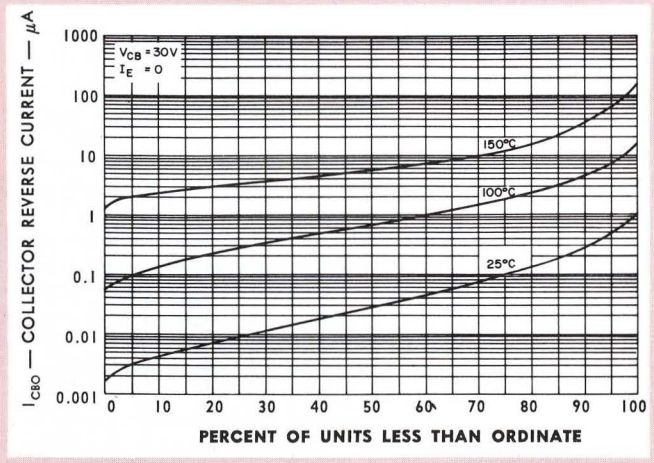
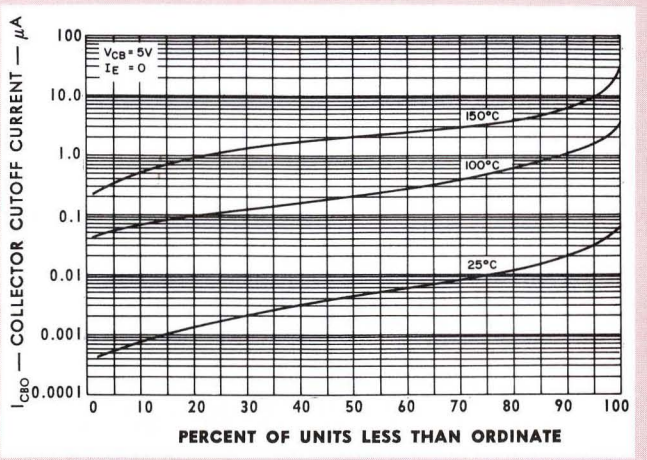
EXPLANATION OF CURVES:

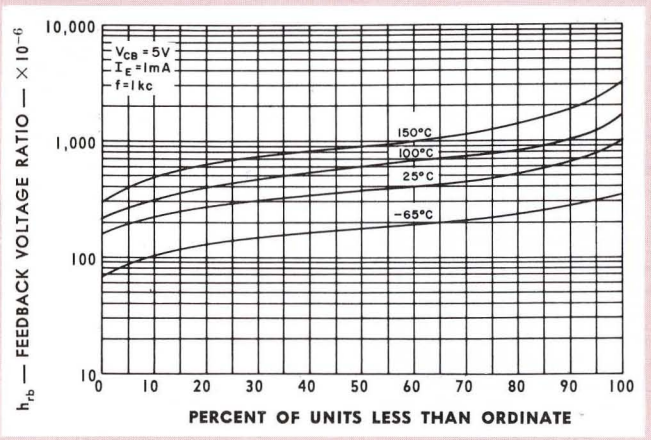
1. The curves shown are based on extensive data. Individual units or small groups of units may not conf

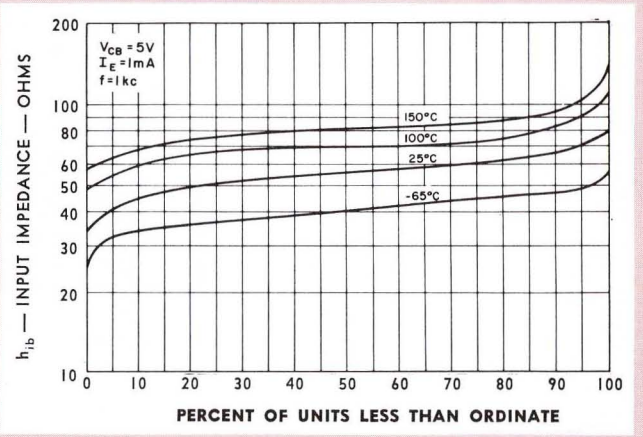
2. All temperatures are ambient except where noted.

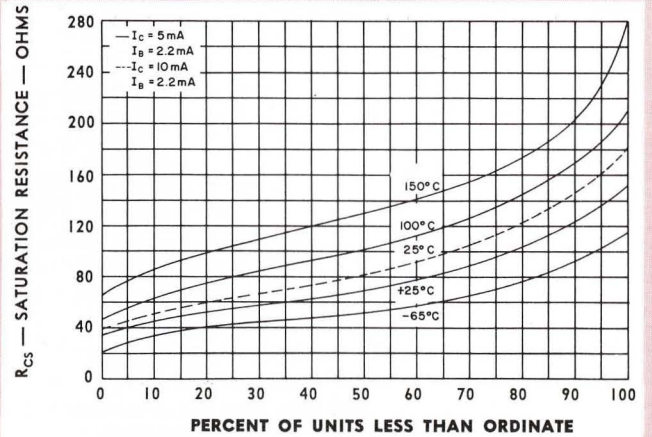
TYPICAL PRODUCTION DISTRIBUTIONS

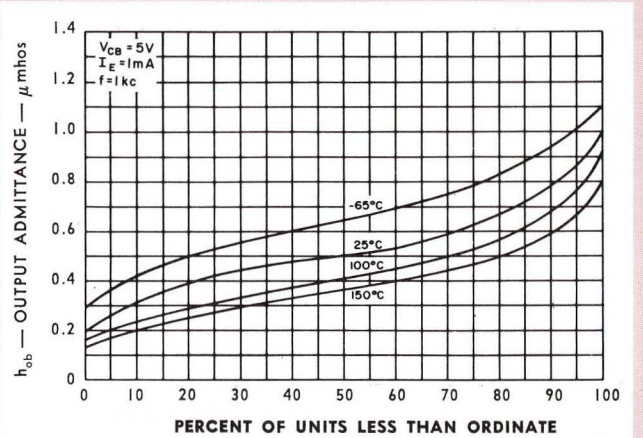












ot conform exactly to the curves. Hence, these curves should be considered to be typical.

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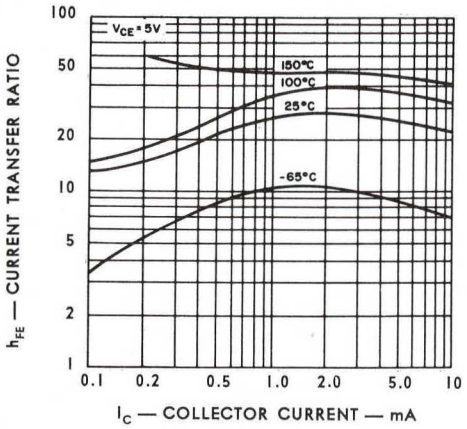
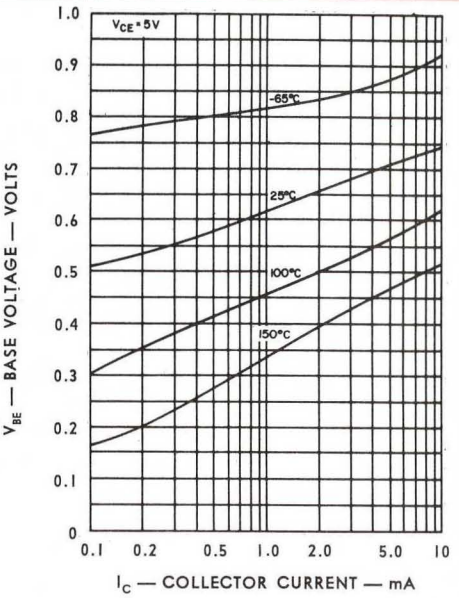
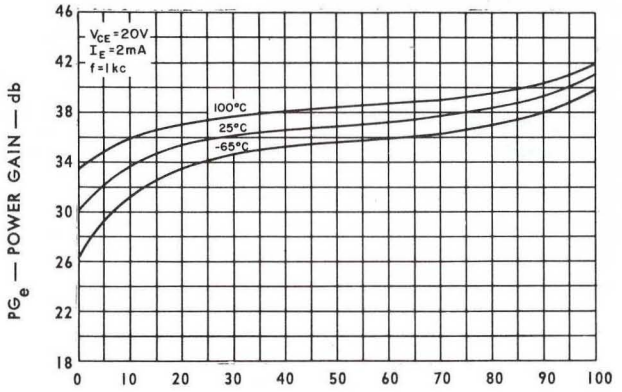
TYPICAL CHARACTERISTICS AND PRODUCTION DISTRIBUTIONS

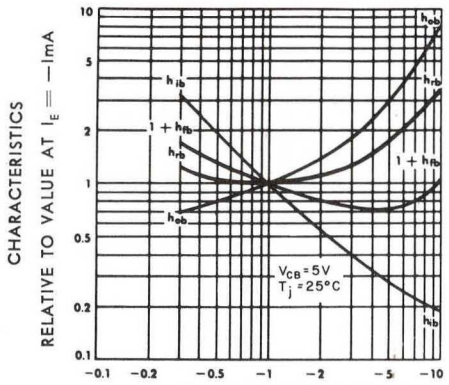




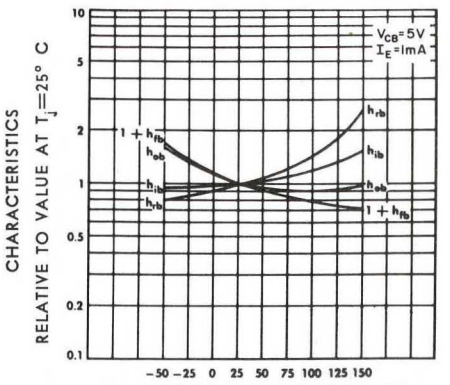


PERCENT OF UNITS LESS THAN ORDINATE

(TYPICAL POWER GAIN 37 db Rg=1K; R_L=20K)



COMMON BASE CHARACTERISTICS VS. EMITTER CURRENT



COMMON BASE CHARACTERISTICS VS. JUNCTION TEMPERATURE

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