TYPES 2N3263, 2N3264, 2N3265, 2N3266
N-P-N SILICON POWER TRANSISTORS

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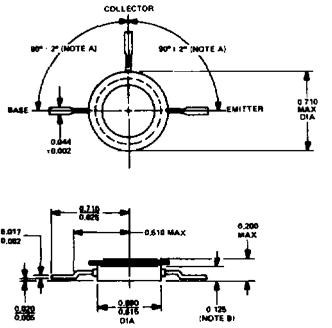
FOR POWER-AMPLIFIER AND HIGH-SPEED SWITCHING APPLICATIONS

- Min f_T = 20 MHz

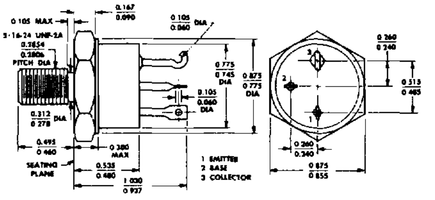
*mechanical data

2N3263, 2N3264 THE COLLECTOR IS IN ELECTRICAL CONTACT WITH THE CASE



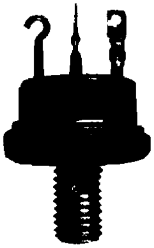
NOTES:
A. Measured where leads emerge from package.
B. Specified body diameter (0.690 maximum, 0.615 minimum) applies within this dimensions but does not include either the brazed area around the collector terminal or the ceramic insulators around the emitter and base terminals.
C. Case temperature measurement point is within 0.125 of the center of the bottom of the package.
D. Dimensions are in inches unless otherwise specified.

2N3265, 2N3266 THE COLLECTOR IS IN ELECTRICAL CONTACT WITH THE CASE



ALL JEDEC TO-63 DIMENSIONS AND NOTES ARE APPLICABLE

CASE TEMPERATURE MEASUREMENT POINT IS UNDERSIDE OF FLAT SURFACE WITHIN 0.125" FROM STUD



ALL DIMENSIONS ARE IN INCHES

absolute maximum ratings at 25°C case temperature (unless otherwise noted)

	2N3263	2N3264	2N3265	2N3266
*Collector-Emitter Voltage (V_{BE} = −1.5 V, See Note 1)	150 V	120 V	150 V	120 V
*Collector-Emitter Voltage (Base Open, See Note 1)	90 V	60 V	90 V	60 V
*Emitter-Base Voltage	← 7 V →			
*Continuous Collector Current	← 25 A →			
*Continuous Base Current	← 10 A →			
*Safe Operating Area at Specified Temperatures	← See Figures 6 and 7 →			
*Continuous Device Dissipation at (or below) 75°C Case Temperature (See Note 2)	83.3 W	83.3 W	125 W	125 W
*Continuous Device Dissipation at 100°C Case Temperature (See Note 2)	66.7 W	66.7 W	100 W	100 W
Continuous Device Dissipation at (or below) 25°C Free-Air Temperature (See Note 3)	1.2 W	1.2 W	4 W	4 W
*Unclamped Inductive Load Energy (See Note 4)	← 2 mJ →			
*Operating Collector Junction Temperature Range	← −65°C to 200°C →			
*Storage Temperature Range	← −65°C to 200°C →			
Lead or Terminal Temperature 1/8 Inch from Case for 10 Seconds	← 260°C →			

NOTES:
1. These values apply only when the collector-emitter voltage is applied with the transistor in the off-state with the base-emitter diode reverse-biased or open-circuited, as specified. In operation, the limitations of Figure 6 or 7, as applicable, must be observed.
2. For operation above 75°C case temperature, refer to Dissipation Derating Curve, Figure 8.
3. For operation above 25°C free-air temperature refer to Dissipation Derating Curve, Figure 9.
4. This rating is based on the capability of the transistor to operate safely in the circuit of Figure 5. L = 40 μH, R_{BB2} = 20 Ω, V_{BB2} = 6 V, R_S = 0.1 Ω, V_{CC} = 20 V. Energy ≈ $I_C{}^2L/2$.

*JEDEC registered data. This data sheet contains all applicable registered data in effect at the time of publication.

TEXAS INSTRUMENTS
INCORPORATED
POST OFFICE BOX 5012 • DALLAS, TEXAS 75222

TYPES 2N3263, 2N3264, 2N3265, 2N3266
N-P-N SILICON POWER TRANSISTORS

*electrical characteristics at 25°C case temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS	2N3263 2N3265 MIN	2N3263 2N3265 MAX	2N3264 2N3266 MIN	2N3264 2N3266 MAX	UNIT
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	I_C = 200 mA, I_B = 0, See Note 5	90		60		V
I_{CEV}	Collector Cutoff Current	V_{CE} = 120 V, V_{BE} = −1.5 V				20	mA
		V_{CE} = 150 V, V_{BE} = −1.5 V		20			
		V_{CE} = 120 V, V_{BE} = −1.5 V, T_C = 125°C				20	
		V_{CE} = 150 V, V_{BE} = −1.5 V, T_C = 125°C		20			
I_{EBO}	Emitter Cutoff Current	V_{EB} = 7 V, I_C = 0		5		15	mA
h_{FE}	Static Forward Current Transfer Ratio	V_{CE} = 3 V, I_C = 15 A, See Notes 5 and 6			20	80	
		V_{CE} = 2 V, I_C = 15 A, See Notes 5 and 6	20	55			
V_{BE}	Base-Emitter Voltage	I_B = 2 A, I_C = 20 A, See Notes 5 and 6		1.8		2.2	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_B = 2 A, I_C = 20 A, See Notes 5 and 6		1		1.6	V
$\|h_{fe}\|$	Small-Signal Common-Emitter Forward Current Transfer Ratio	V_{CE} = 10 V, I_C = 3 A, f = 5 MHz	4		4		

*switching characteristics at 25°C case temperature

PARAMETER		TEST CONDITIONS†	2N3263 2N3265 MAX	2N3264 2N3266 MAX	UNIT
t_r	Rise Time	I_C = 15 A, $I_{B(1)}$ = 1.2 A, $I_{B(2)}$ = −1.2 A, $V_{BE(off)}$ = −6.3 V, R_L = 2 Ω, See Figure 4	0.5	0.5	μs
t_s	Storage Time		1.5	1.5	
t_f	Fall Time		0.5	0.5	
t_{on}	Turn-On Time		0.5	0.5	
t_{off}	Turn-Off Time		2	2	

†Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

*JEDEC registered data

TYPICAL CHARACTERISTICS

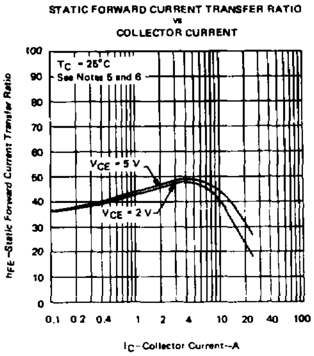


FIGURE 1

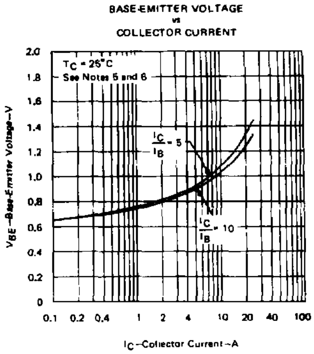


FIGURE 2

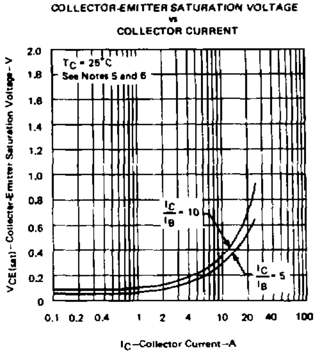
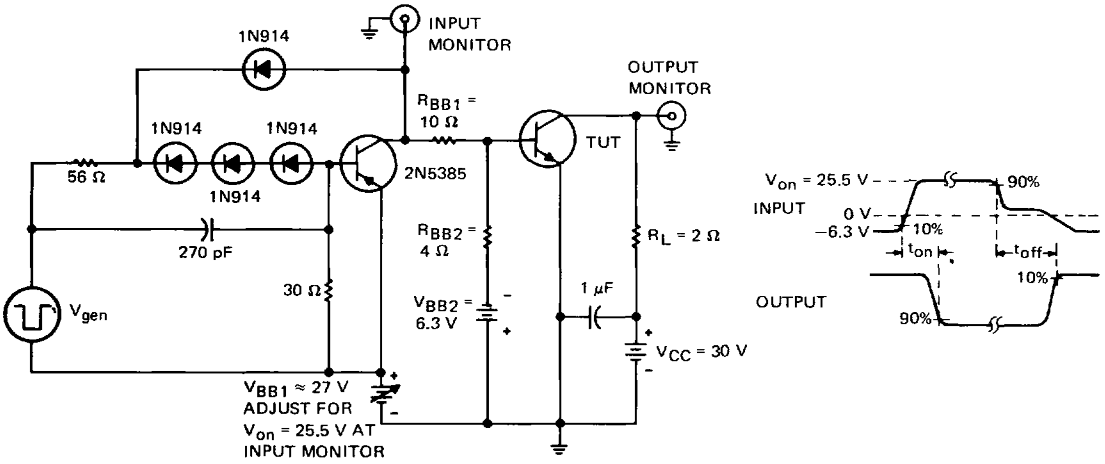


FIGURE 3

NOTES: 5. These parameters must be measured using pulse techniques. t_w = 300 μs, duty cycle ≤ 2%.

6. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts and located within 0.125 inch from the device body.

PARAMETER MEASUREMENT INFORMATION



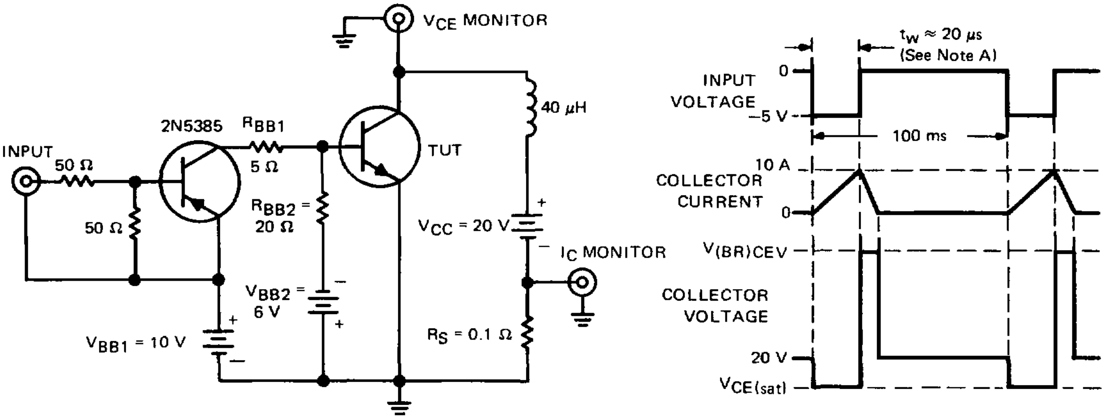
TEST CIRCUIT

VOLTAGE WAVEFORMS

NOTES:
A. V_{gen} is a −30-V pulse (from 0 V) into a 50-Ω termination.
B. The V_{gen} waveform is supplied by a generator with the following characteristics: $t_r \leq 15$ ns, $t_f \leq 15$ ns, $Z_{out} = 50\ \Omega$, $t_w = 20\ \mu s$, duty cycle ≤ 2%.
C. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r \leq 15$ ns, $R_{in} \geq 10\ M\Omega$, $C_{in} \leq 11.5$ pF.
D. Resistors must be noninductive types.
E. The d-c power supplies may require additional bypassing in order to minimize ringing.

FIGURE 4

INDUCTIVE LOAD SWITCHING



TEST CIRCUIT

VOLTAGE AND CURRENT WAVEFORMS

NOTE A: Input pulse width is increased until I_{CM} = 10 A.

FIGURE 5

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MAXIMUM SAFE OPERATING AREA

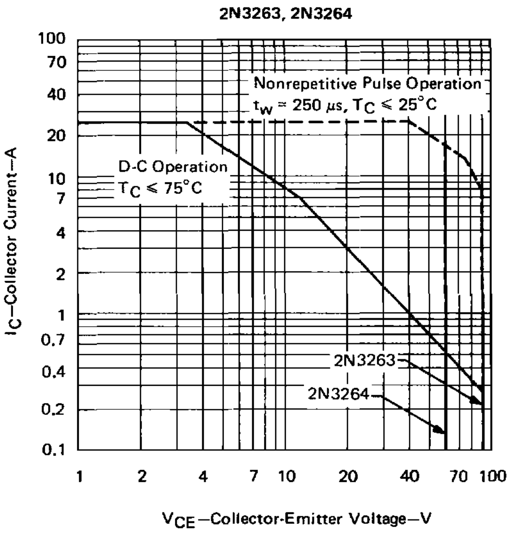
2N3263, 2N3264

FIGURE 6

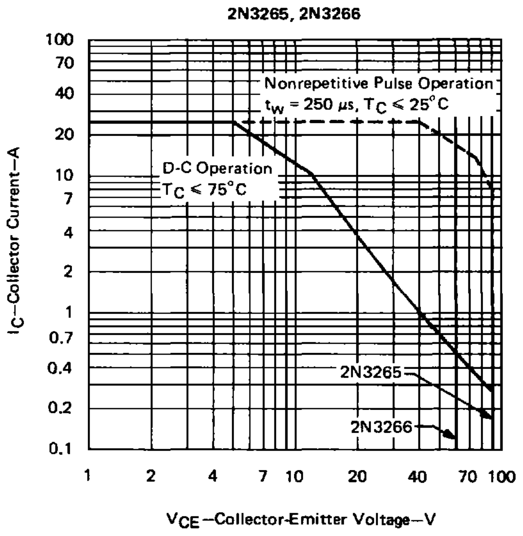
2N3265, 2N3266

FIGURE 7

THERMAL INFORMATION

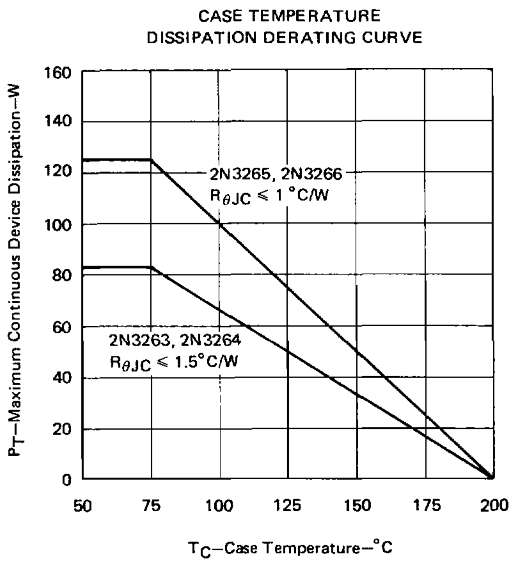
CASE TEMPERATURE
DISSIPATION DERATING CURVE

FIGURE 8

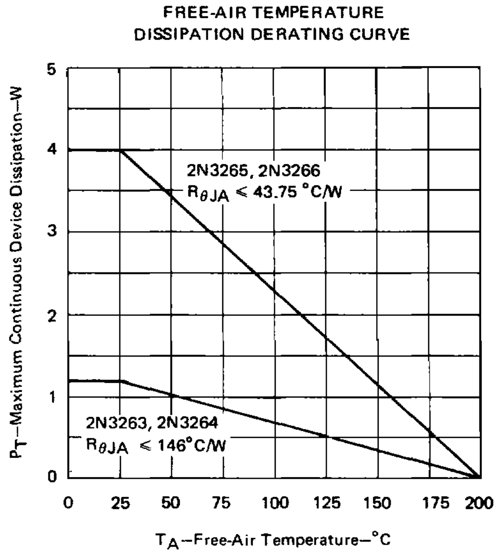
FREE-AIR TEMPERATURE
DISSIPATION DERATING CURVE

FIGURE 9