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2N3868

Silicon PNP Power Transistors

APPLICATIONS:

- High-Speed Switching
- Medium-Current Switching
- High-Frequency Amplifiers

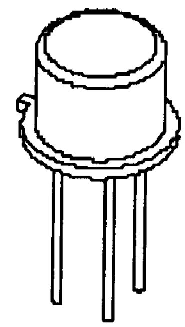
FEATURES:

- Collector-Emitter Sustaining Voltage: $V_{CEO(sus)}$ = - 60 Vdc (Min)
- DC Current Gain: h_{FE} = 30-150 @ I_C = 1.5 Adc
- Low Collector-Emitter Saturation Voltage: $V_{CE(sat)}$ = - 0.75 Vdc @ I_C = 1.5 Adc
- High Current-Gain - Bandwidth Product: f_T = 90 MHz (Typ)

DESCRIPTION:

These power transistors are produced by PPC's DOUBLE DIFFUSED PLANAR process. This technology produces high voltage devices with excellent switching speeds, frequency response, gain linearity, saturation voltages, high current gain, and safe operating areas. They are intended for use in Commercial, Industrial, and Military power switching, amplifier, and regulator applications.

Ultrasonically bonded leads and controlled die mount techniques are utilized to further increase the SOA capability and inherent reliability of these devices. The temperature range to 200°C permits reliable operation in high ambients, and the hermetically sealed package insures maximum reliability and long life.



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ABSOLUTE MAXIMUM RATINGS:

SYMBOL	CHARACTERISTIC	VALUE	UNITS
V_{CEO}*	Collector-Emitter Voltage	- 60	Vdc
V_{CB}*	Collector-Base Voltage	- 60	Vdc
V_{EB}*	Emitter-Base Voltage	- 4.0	Vdc
I_C*	Peak Collector Current	10	Adc
I_C*	Continuous Collector Current	3.0	Adc
I_B*	Base Current	0.5	Adc
T_{STG}*	Storage Temperature	-65 to 200	°C
T_J*	Operating Junction Temperature	-65 to 200	°C
P_D*	Total Device Dissipation T_C = 25°C	6.0	Watts
	Derate above 25°C	34.3	mW/°C
P_D*	Total Device Dissipation T_A = 25°C	1.0	Watts
	Derate above 25°C	5.71	mW/°C
θ JC	Thermal Resistance		
	Junction to Case	29	°C/W
	Junction to Ambient	175	°C/W

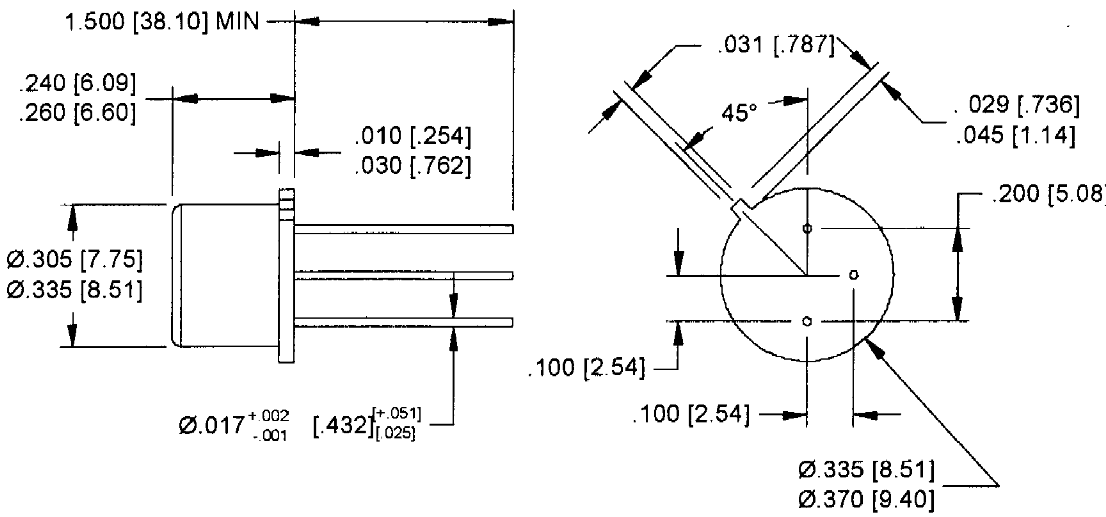
ELECTRICAL CHARACTERISTICS:

(25°Case Temperature Unless Otherwise Noted)

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE Min.	VALUE Max.	Units
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage	I_C = 20 mAdc, I_B = 0 (Note 1)	- 60	----	Vdc
BV_{CBO}*	Collector-Base Breakdown Voltage	I_C = 100 μAdc, I_E = 0	- 60	----	Vdc
BV_{EBO}*	Emitter-Base Breakdown Voltage	I_E = 100 μAdc, I_C = 0	- 4.0	----	Vdc
I_{CEX}*	Collector Cutoff Current	V_{CE} = - 60V, $V_{BE(off)}$ = 2.0 Vdc	----	1.0	μAdc
I_{CBO}*	Collector Cutoff Current	V_{CB} = - 60V, I_E = 0, T_C = 150°C	----	150	μAdc
h_{FE}*	DC Current Gain (Note 1)	I_C = 500 mAdc, V_{CE} = - 1.0 Vdc I_C = 1.5 Adc, V_{CE} = - 2.0 Vdc I_C = 2.5 Adc, V_{CE} = - 3.0 Vdc I_C = 3.0 Adc, V_{CE} = - 5.0 Vdc	35 30 20 20	---- 150 ---- ----	---- ---- ---- ----
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage (Note 1)	I_C = 500 mAdc, I_B = 50 mAdc I_C = 1.5 Adc, I_B = 150 mAdc I_C = 2.5 Adc, I_B = 250 mAdc	---- ---- ----	- 0.5 - 0.75 - 1.3	Vdc Vdc Vdc
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage (Note 1)	I_C = 500 mAdc, I_B = 50 mAdc I_C = 1.5 Adc, I_B = 150 mAdc I_C = 2.5 Adc, I_B = 250 mAdc	---- - 0.9 ----	- 1.0 - 1.4 - 2.0	Vdc Vdc Vdc
f_T*	Current Gain Bandwidth Product (Note 2)	I_C = 100 mAdc, V_{CE} = - 5.0 Vdc, f_{test} = 20 MHz	60	----	MHz
C_{ob}*	Output Capacitance	V_{CB} = - 10 Vdc, I_E = 0, f = 0.1 MHz	----	120	pF
C_{ib}*	Input Capacitance	V_{EB} = - 3.0 Vdc, I_C = 0, f = 0.1 MHz	----	1000	pF
td*	Delay Time	V_{CC} = - 30 Vdc, $V_{BE(off)}$ = 0, I_C =1.5 Adc, I_{B1} = 150 mAdc	----	35	ns
tr*	Rise Time	V_{CC} = - 30 Vdc, $V_{BE(off)}$ = 0, I_C =1.5 Adc, I_{B1} = 150 mAdc	----	65	ns
ts*	Storage Time	V_{CC} = - 30 Vdc, IC = 1.5 Adc, I_{B1} = I_{B2} =150 mAdc	----	325	ns
tf*	Fall Time	V_{CC} = - 30 Vdc, IC = 1.5 Adc, I_{B1} = I_{B2} =150 mAdc	----	75	ns

PACKAGE MECHANICAL DATA:

TO-5



NOTE: DIMENSIONS IN [ ] = MILLIMETERS