New Jersey Semi-Conductor Products, Inc.

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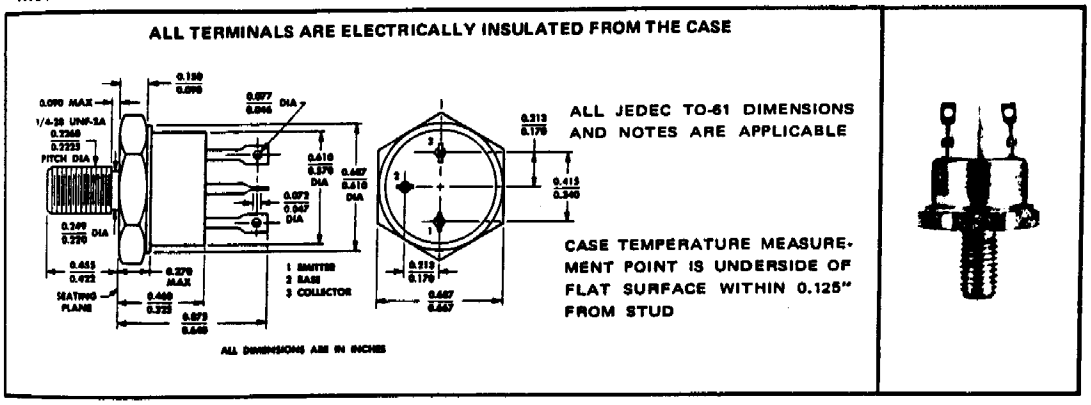
TYPE 2N6128
N-P-N SILICON POWER TRANSISTOR

HIGH-FREQUENCY, HIGH-POWER TRANSISTOR WITH COMPUTER-DESIGNED ISOTHERMAL GEOMETRY

- 40 mJ Reverse Energy Rating with I_C = 20 A and 4 V Reverse Bias
- Isolated Stud Package
- 100 W at 50°C Case Temperature
- Min f_T of 50 MHz at 5 V, 2 A
- Designed for Complementary Use with 2N6127

*mechanical data



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

Collector-Base Voltage	100 V
Collector-Emitter Voltage (See Note 1)	80 V
Emitter-Base Voltage	6 V
Continuous Collector Current	10 A
Peak Collector Current (See Note 2)	20 A
Continuous Base Current	3 A
Safe Operating Areas	See Figures 6 and 7
Continuous Device Dissipation at (or below) 50°C Case Temperature (See Note 3)	100 W
Continuous Device Dissipation at 100°C Case Temperature (See Note 3)	67 W
Unclamped Inductive Load Energy ($V_{BE(off)}$ = 0, See Note 4)	50 mJ
Unclamped Inductive Load Energy ($V_{BE(off)}$ = −4 V, See Note 4)	40 mJ
Operating Collector Junction Temperature Range	−65°C to 200°C
Storage Temperature Range	−65°C to 200°C
Terminal Temperature 1/8 Inch from Case for 60 Seconds	300°C

NOTES: 1. This value applies when the base-emitter diode is open-circuited.
2. This value applies for $t_w \leq 0.3$ ms, duty cycle ≤ 10%.
3. Derate linearly to 200°C case temperature at the rate of 0.67 W/°C.
4. These ratings are based on the capability of the transistor to operate safely in the circuit of Figure 2.

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

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TYPE 2N6128
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*electrical characteristics at 25°C case temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS			MIN	MAX	UNIT
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	I_C = 200 mA,	I_B = 0,	See Note 5	80		V
I_{CEO}	Collector Cutoff Current	V_{CE} = 40 V,	I_B = 0			100	μA
I_{CES}	Collector Cutoff Current	V_{CE} = 60 V,	V_{BE} = 0			10	μA
		V_{CE} = 100 V,	V_{BE} = 0			1	mA
		V_{CE} = 60 V,	V_{BE} = 0,	T_C = 150°C		500	μA
I_{EBO}	Emitter Cutoff Current	V_{EB} = 5 V,	I_C = 0			10	μA
		V_{EB} = 6 V,	I_C = 0			1	mA
h_{FE}	Static Forward Current Transfer Ratio	V_{CE} = 5 V,	I_C = 100 mA	See Notes 5 and 6	20		
		V_{CE} = 5 V,	I_C = 5 A		30	120	
		V_{CE} = 5 V,	I_C = 10 A		15		
		V_{CE} = 5 V, T_C = −55°C	I_C = 5 A,		12		
V_{BE}	Base-Emitter Voltage	I_B = 0.5 A,	I_C = 5 A	See Notes 5 and 6		1.8	V
		V_{CE} = 5 V,	I_C = 5 A			1.8	
		V_{CE} = 5 V,	I_C = 10 A			2.2	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_B = 0.5 A,	I_C = 5 A	See Notes 5 and 6		0.9	V
		I_B = 1 A,	I_C = 10 A			2.2	
h_{fe}	Small-Signal Common-Emitter Forward Current Transfer Ratio	V_{CE} = 5 V,	I_C = 0.2 A,	f = 1 kHz	20		
$\|h_{fe}\|$	Small-Signal Common-Emitter Forward Current Transfer Ratio	V_{CE} = 5 V,	I_C = 2 A,	f = 20 MHz	2.5		
C_{obo}	Common-Base Open-Circuit Output Capacitance	V_{CB} = 10 V,	I_E = 0,	f = 1 MHz		275	pF

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.

thermal characteristics

PARAMETER		MAX	UNIT
$R_{\theta JC}$	Junction to Case Thermal Resistance	1.5	°C/W

switching characteristics at 25°C case temperature

PARAMETER		TEST CONDITIONS†			TYP	UNIT
t_{on}	Turn-On Time	I_C = 10 A,	$I_{B(1)}$ = 1 A,	$I_{B(2)}$ = −1 A,	0.5	μs
t_{off}	Turn-Off Time	$V_{BE(off)}$ = −3.8 V,	R_L = 3 Ω,	See Figure 1	1.3	

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

*JEDEC registered data

Quality Semi-Conductors