RoHS

Available on commercial versions

NPN Power Silicon Transistor

Qualified per MIL-PRF-19500/315

Qualified Levels:
JAN, JANTX, and JANTXV

DESCRIPTION

This NPN silicon transistor is rated at 5 amps and is military qualified up to a JANTXV level. This TO-59 isolated package features a 180 degree lead orientation.

Important: For the latest information, visit our website http://www.microsemi.com.

Marking may vary.

TO-59 Package

FEATURES

- JEDEC registered 2N2880
- Low saturation voltage
- Low leakage current
- Fast switching capable - 0.5 μs rise time
- High frequency response
- TO-59 case with isolated terminals
- JAN, JANTX, and JANTXV, qualifications are available per MIL-PRF-19500/315
- RoHS compliant versions available (commercial grade only)

APPLICATIONS / BENEFITS

- Class 3B to ESD per MIL-STD-750 Method 1020
- High frequency inverters
- Converters
- Linear amplifiers
- High speed switching regulated power supplies
- RF power supplies

MAXIMUM RATINGS

Parameters/Test Conditions		Symbol	Value	Unit
Junction and Storage Temperature		T_J and T_{STG}	-65 to +200	°C
Thermal Resistance Junction-to-Case		$R_{\Theta JC}$	3.33	°C/W
Collector Current		I_C	5.0	A
Collector-Emitter Voltage		V_{CEO}	80	V
Collector-Base Voltage		V_{CBO}	110	V
Emitter-Base Voltage		V_{EBO}	8.0	V
Total Power Dissipation	@ T_A = +25°C (1)	P_T	2.0	W
	@ T_C = +100°C (2)		30	

Notes:
1. Derate linearly 11.4 mW/°C for T_A > +25°C.
2. Derate linearly 300 mW/°C for T_C > +100°C.

MSC – Lawrence
6 Lake Street,
Lawrence, MA 01841
1-800-446-1158
(978) 620-2600
Fax: (978) 689-0803

MSC – Ireland
Gort Road Business Park,
Ennis, Co. Clare, Ireland
Tel: +353 (0) 65 6840044
Fax: +353 (0) 65 6822298

Website:
www.microsemi.com

One Enterprise, Aliso Viejo, CA 92656 Ph: 949-380-6100 sales.support@microsemi.com

MECHANICAL and PACKAGING

- CASE: Nickel Plated
- TERMINALS: Solder Dip over Nickel Plating. RoHS compliant Matte/Tin available on commercial grade only.
- MARKING: Manufacturer's ID, Date Code, Part Number, BeO
- POLARITY: See Package Outline Drawing on last page
- WEIGHT: Approximately 4.576 grams
- See Package Dimensions on last page.

PART NOMENCLATURE

JAN **2N2880** **(e3)**

Reliability Level
JAN = JAN Level
JANTX = JANTX Level
JANTXV = JANTXV Level
Blank = Commercial

JEDEC type number
(see Electrical Characteristics table)

RoHS Compliance
e3 = RoHS Compliant (available on commercial grade only)
Blank = non-RoHS Compliant

SYMBOLS & DEFINITIONS

Symbol	Definition
I_B	Base current: The value of the dc current into the base terminal.
I_C	Collector current: The value of the dc current into the collector terminal.
I_E	Emitter current: The value of the dc current into the emitter terminal.
P_T	Total power dissipation: The sum of the forward and reverse power dissipations.
V_{BE}	Base-emitter voltage: The dc voltage between the base and the emitter.
V_{CE}	Collector-emitter voltage: The dc voltage between the collector and the emitter.
V_{CEO}	Collector-emitter voltage, base open: The voltage between the collector and the emitter terminals when the base terminal is open-circuited.
V_{CB}	Collector-base voltage: The dc voltage between the collector and the base.
V_{CBO}	Collector-base voltage, base open: The voltage between the collector and base terminals when the emitter terminal is open-circuited.
V_{EB}	Emitter-base voltage: The dc voltage between the emitter and the base
V_{EBO}	Emitter-base voltage, collector open: The voltage between the emitter and base terminals with the collector terminal open-circuited.

One Enterprise, Aliso Viejo, CA 92656 Ph: 949-380-6100 sales.support@microsemi.com

ELECTRICAL CHARACTERISTICS @ T_C = 25 °C unless otherwise noted

Characteristic	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage I_C = 100 mA	$V_{(BR)CEO}$	80		V
Collector-Emitter Breakdown Voltage I_C = 10 µA	$V_{(BR)CBO}$	110		V
Emitter-Base Breakdown to Voltage I_E = 10 µA	$V_{(BR)EBO}$	8.0		V
Collector-Emitter Cutoff Current V_{CE} = 60 V	I_{CEO}		20	µA
Collector-Base Cutoff Current V_{CB} = 80 V	I_{CBO}		0.2	µA
Collector-Emitter Cutoff Current V_{CE} = 110 V, V_{BE} = -0.5	I_{CEX}		1.0	µA
Emitter-Base Cutoff Current V_{EB} = 6.0 V	I_{EBO}		0.2	µA
ON CHARACTERISTICS				
Forward-Current Transfer Ratio I_C = 50 mA, V_{CE} = 5.0 V I_C = 1.0 A, V_{CE} = 2.0 V I_C = 5.0 A, V_{CE} = 5.0 V	h_{FE}	40 40 15	120 120	
Base-Emitter Voltage Non-saturated V_{CE} = 2.0 V, I_C = 1.0 A	V_{BE}		1.2	V
Collector-Emitter Saturation Voltage I_C = 1.0 A, I_B = 0.1 A I_C = 5.0 A, I_B = 0.5 A	$V_{CE(sat)}$		0.25 1.5	V
Base-Emitter Saturation Voltage I_C = 1.0 A, I_B = 0.1 A	$V_{BE(sat)}$		1.2	V
DYNAMIC CHARACTERISTICS				
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I_C = 1.0 A, V_{CE} = 10.0 V, f = 10 MHz	$\|h_{fe}\|$	3.0	12	
Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I_C = 50 mA, V_{CE} = 5.0 V, f = 1 kHz	h_{fe}	40	140	
Output Capacitance V_{CB} = 10 V, I_E = 0, 100 ≤ f ≤ 1.0 MHz	C_{obo}		150	pF
SWITCHING CHARACTERISTICS				
Pulse delay time	t_d		60	ns
Pulse rise time	t_r		300	ns
Pulse storage time	t_s		1.7	µs
Pulse fall time	t_f		300	ns

One Enterprise, Aliso Viejo, CA 92656 Ph: 949-380-6100 sales.support@microsemi.com

ELECTRICAL CHARACTERISTICS @ T_C = 25°C unless otherwise noted. (continued)

SAFE OPERATING AREA (See Figure below and MIL-STD-750,Test Method 3053)

DC Tests

T_C = +100°C, t = 10 seconds

Test 1

V_{CE} = 80 V, I_C = 80 mA

Test 2

V_{CE} = 20 V, I_C = 1.5 A

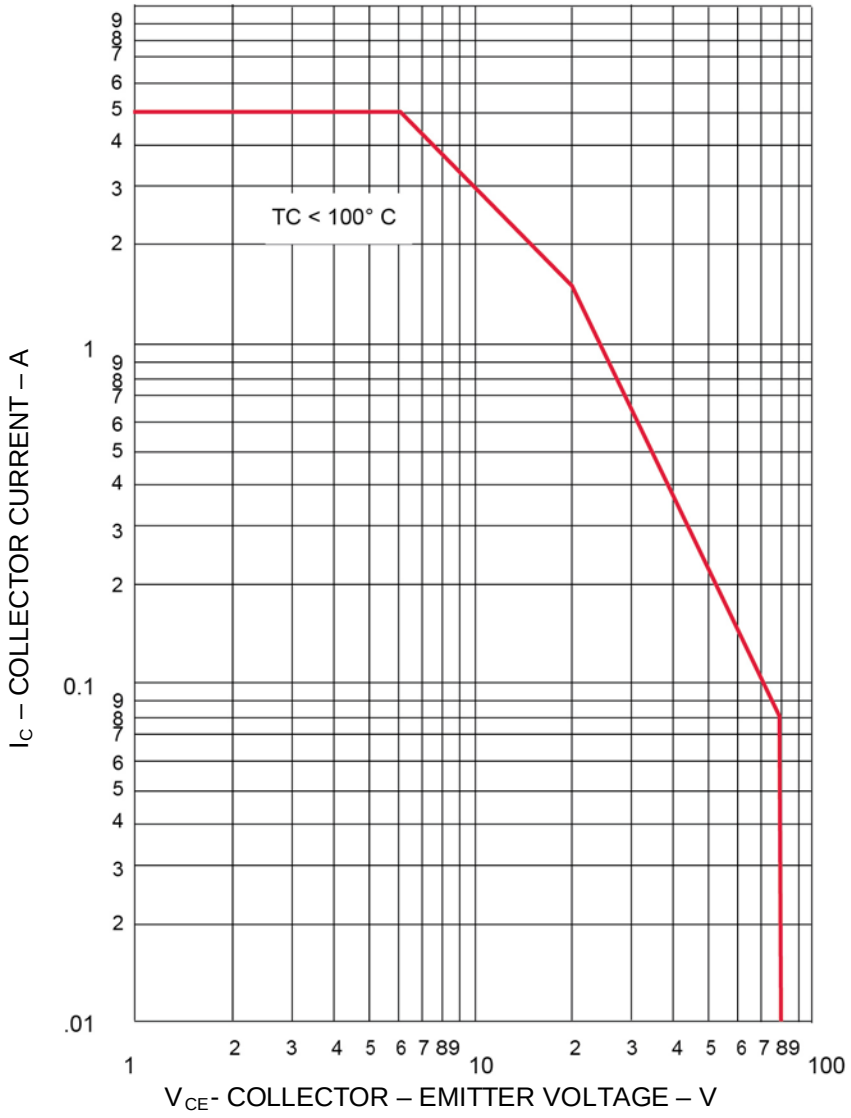


FIGURE 1

Maximum Safe Operating Area

One Enterprise, Aliso Viejo, CA 92656 Ph: 949-380-6100 sales.support@microsemi.com

GRAPHS

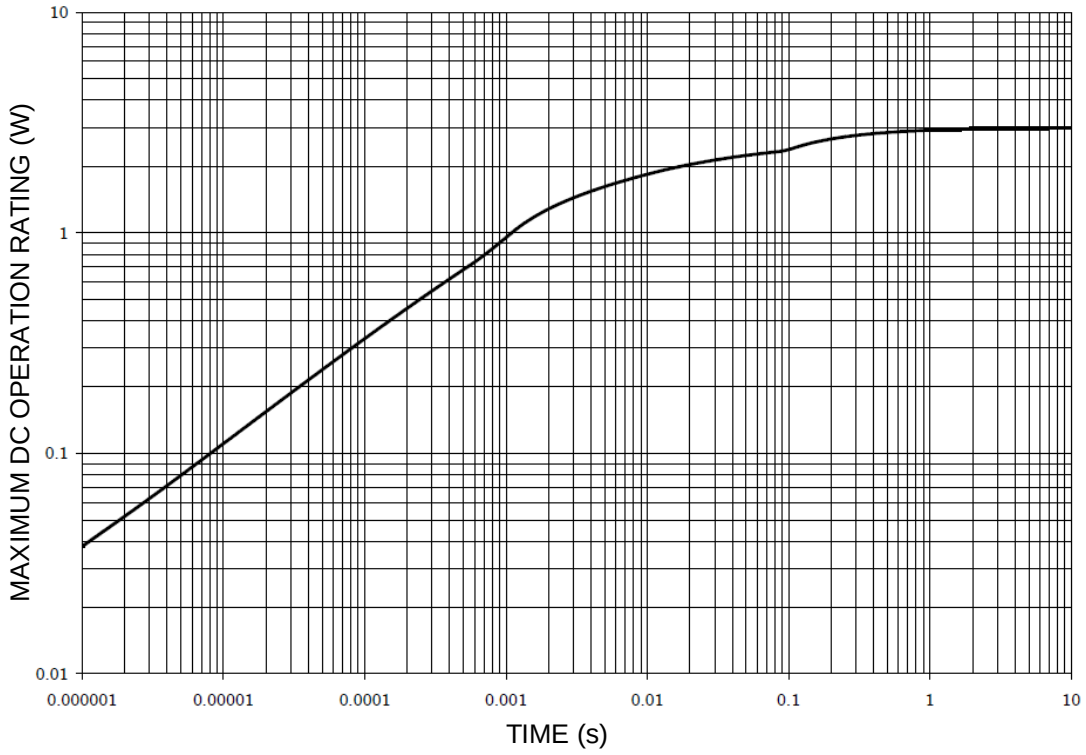
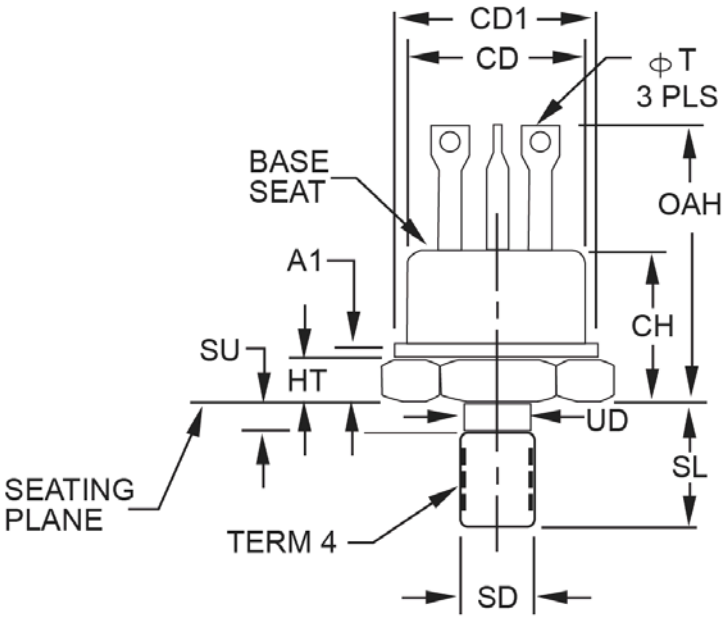
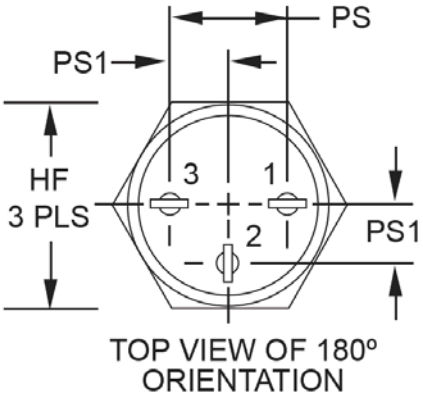


FIGURE 2
Thermal Impedance

One Enterprise, Aliso Viejo, CA 92656 Ph: 949-380-6100 sales.support@microsemi.com

PACKAGE DIMENSIONS





NOTES:

1. Dimensions are in inches.
2. Millimeters are given for information only.
3. Collector shall be electrically connected to the case. This terminal may be flattened and pierced only when the 90 degree option is used.
4. SD is the outer diameter of coated threads. (Reference: Screw thread standards for Federal Standard H28/1 , (FED-STD-H28/1).
5. The orientation of the terminals in relation to the hex flats is not controlled.
6. All three terminals.
7. The case temperature may be measured anywhere on the seating plane within .125 (3.18 mm) of the stud.
8. Terminal spacing measured at the base seat only.
9. Dimensions e, e1, PS1, and PS are measured from the center line of terminals.
10. Maximum unthreaded dimension.
11. This dimension applies to the location of the center line of the terminals.
12. A 90 degee angle lead orientation as shown may be used at the option of the manufacturer. All dimensions of the basic outline except e, e1, and the 120 degree lead angle apply to this option.

Symbol	Dimension				Notes
	Inch		Millimeters		
	Min	Max	Min	Max	
A1	0.090	0.150	2.29	3.81	
CD	0.320	0.468	8.13	11.89	
CD1	0.380	0.437	9.65	11.10	
CH	0.320	0.468	8.13	11.89	
HF	0.423	0.438	10.74	11.13	
HT	-	0.250	-	6.35	
OAH	0.570	0.763	14.48	19.38	4
PS	0.185	0.215	4.70	5.46	5, 8, 9
PS1	0.090	0.110	2.29	2.79	5, 8, 9
SD	0.190-32UNF-2A				4
SL	0.400	0.455	10.16	11.56	
SU	-	0.078	-	1.98	10
ϕT	0.040	0.065	1.02	1.65	
UD	0.155	0.189	3.94	4.80	

One Enterprise, Aliso Viejo, CA 92656 Ph: 949-380-6100 sales.support@microsemi.com