Available on commercial versions

RF and MICROWAVE DISCRETE LOW POWER TRANSISTORS

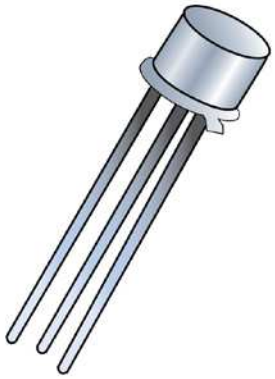
Qualified per MIL-PRF-19500/343

Qualified Levels: JAN, JANTX, and JANTXV

DESCRIPTION

The 2N2857 is a military qualified silicon NPN transistor (also available in commercial version), designed for UHF equipment and other high-reliability applications. Common applications include low noise amplifier; oscillator, and mixer applications. Microsemi also offers numerous other products to meet higher and lower power voltage regulation applications.

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



TO-72 Package

Also available in:

UB Package
(surface mount)
2N2857UB

FEATURES

- JEDEC registered 2N2857.
- Silicon NPN, TO-72 packaged UHF transistor.
- Maximum unilateral gain = 13 dB (typ) @ 500 MHz.
- JAN, JANTX, and JANTXV military qualified versions available per MIL-PRF-19500/343.
- RoHS compliant version available (commercial grade only).

APPLICATIONS / BENEFITS

- Low-power, ultra-high frequency transistor.
- Leaded metal TO-72 package.

MAXIMUM RATINGS @ T_A = +25 °C

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T_J and T_{STG}	-65 to +200	°C
Collector-Emitter Voltage	V_{CEO}	15	V
Collector-Base Voltage	V_{CBO}	30	V
Emitter-Base Voltage	V_{EBO}	3	V
Thermal Resistance Junction-to-Ambient	$R_{\Theta JA}$	400	°C/W
Steady-State Power Dissipation (1)	P_D	200	mW
Collector Current	I_C	40	mA

Notes: 1. Derate linearly 1.14 mW/°C for T_A > +25 °C.

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MECHANICAL and PACKAGING

- CASE: Ni plated kovar, Ni cap.
- TERMINALS: Au over Ni plated kovar leads, solder dipped.
- MARKING: Manufacturer's ID, date code, part number.
- POLARITY: See case outline on last page.
- WEIGHT: 0.322 grams.
- See Package Dimensions on last page.

PART NOMENCLATURE

JAN **2N2857** **(e3)**

Reliability Level
JAN=JAN level
JANTX=JAN 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_C	Collector current (dc).
I_B	Base current (dc).
T_A	Ambient or free air temperature.
T_C	Case temperature.
V_{CB}	Collector to base voltage (dc).
V_{EB}	Emitter to base voltage (dc).

ELECTRICAL CHARACTERISTICS @ T_C = +25°C

OFF CHARACTERISTICS

Test Conditions	Symbol	Value			
		Min.	Typ.	Max.	Unit
Collector-Emitter Breakdown Voltage (I_C = 3.0 mA, Bias condition D)	$V_{(BR)CEO}$	15	-	-	V
Collector to Emitter Cutoff Current (V_{CE} = 16 V, Bias condition C)	I_{CES}	-	-	100	nA
Emitter to Base Cutoff Current (V_{EB} = 3 V, Bias condition D)	I_{EBO}	-	-	10	µA
Collector to Base Cutoff Current (V_{CB} = 15 V, Bias condition D)	I_{CBO}	-	-	10	nA

ON CHARACTERISTICS

Test Conditions	Symbol	Value			
		Min.	Typ.	Max.	Unit
Forward Current transfer ratio (I_C = 3.0 mA, V_{CE} = 1.0 V)	h_{FE}	30	-	150	
Collector-Emitter Saturation Voltage (I_C = 10 mA, I_B = 1 mA)	$V_{CE(sat)}$		-	0.4	V
Base-Emitter Saturation Voltage (I_C = 10 mA, I_B = 1 mA)	$V_{BE(sat)}$		-	1.0	V

DYNAMIC CHARACTERISTICS

Test Conditions	Symbol	Value			Unit
		Min.	Typ.	Max.	
Magnitude of common emitter small signal short circuit forward current transfer ratio (V_{CE} = 6 V, Ic = 5 mA, f = 100 MHz)	$\|h_{fe}\|$	10	-	21	
Collector-base time constant (I_E = 2.0 mA, V_{CB} = 6.0 V, f = 31.9 MHz)	$r_b'C_c$	4	-	15	pF
Collector to Base – feedback capacitance (I_E = 0 mA, V_{CB} = 10 V, 100 kHz ≤ f ≤ 1 MHz)	C_{cb}			1.0	pF
Noise Figure (50 Ohms) (I_C = 1.5 mA, V_{CE} = 6 V, f = 450 MHz, R_g = 50 Ω)	F		4.5		dB
Small Signal Power Gain (common emitter) (I_E = 1.5 mA, V_{CE} = 6 V, f = 450 MHz	G_{pe}	12.5		21	dB

GRAPHS

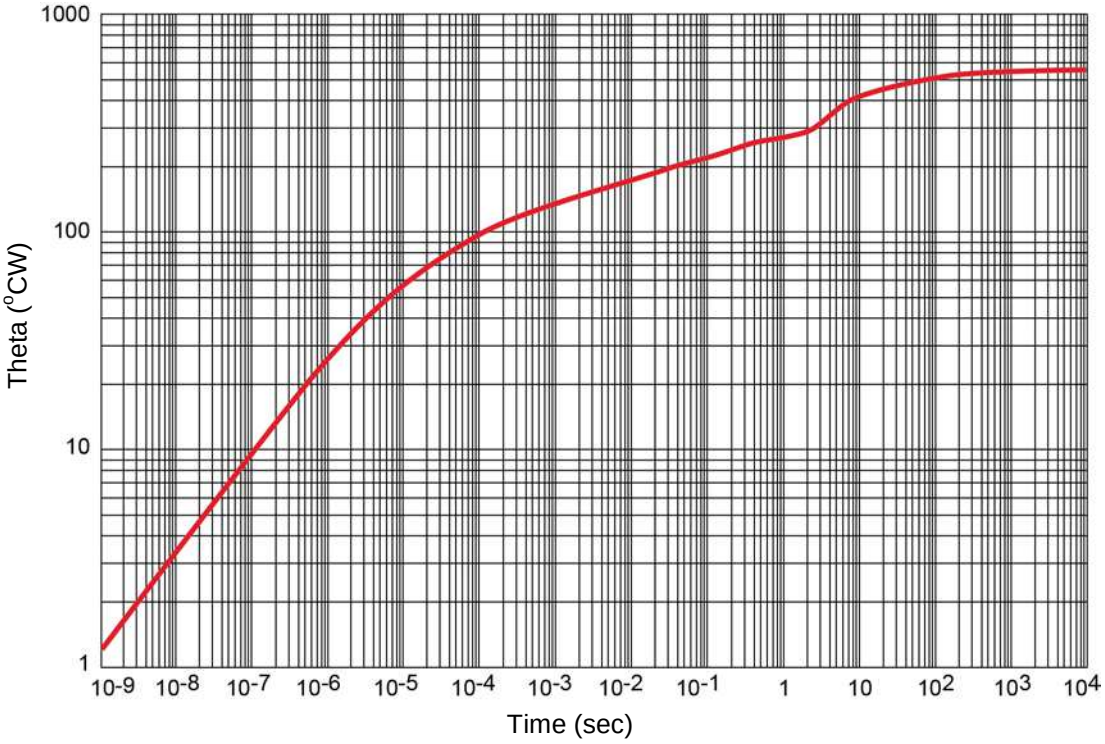


FIGURE 1
Maximum Thermal Impedance ($R_{\theta JA}$)

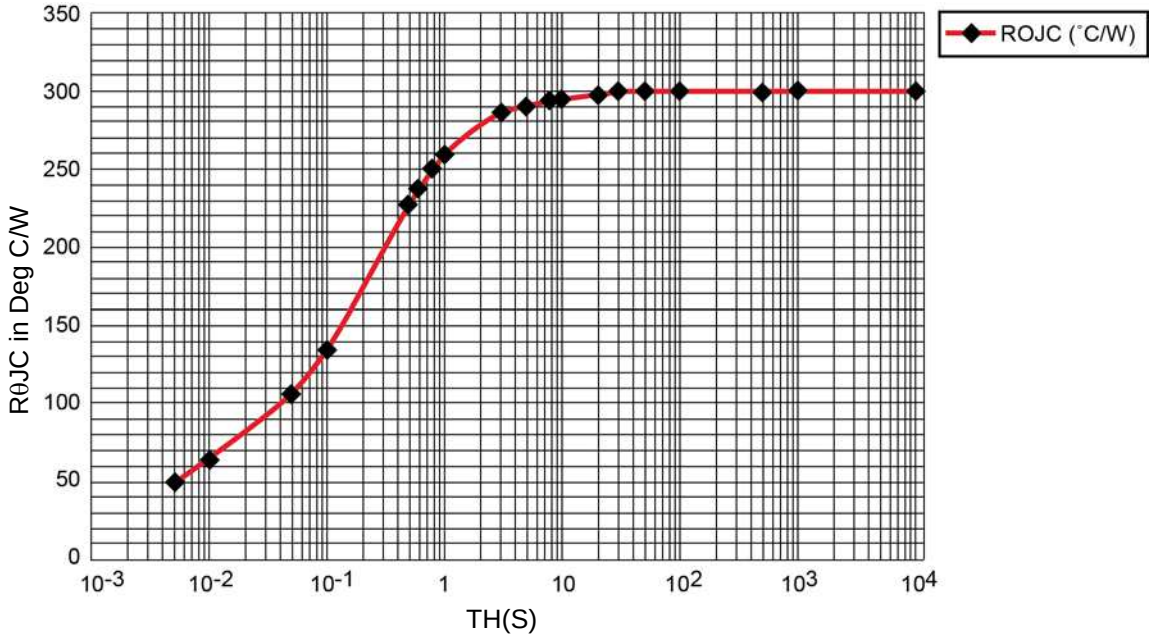
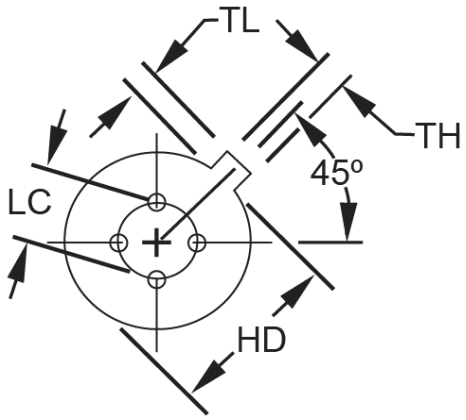
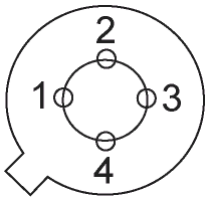
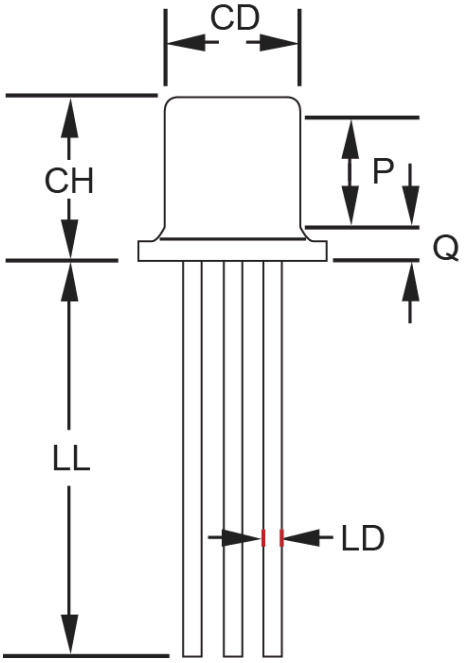


FIGURE 2
Thermal impedance graph ($R_{\theta JC}$)

PACKAGE DIMENSIONS







Ltr	Dimensions				Notes
	Inch		Millimeters		
	Min	Max	Min	Max	
TL	.028	.048	.071	1.22	
TH	.036	.046	.091	1.17	
HD	.209	.230	5.31	5.84	5
CD	.178	.195	4.52	4.95	5
LD	.016	.021	.410	.533	7, 8
LC	.100 TP		2.54 TP		7, 8
CH	.170	.210	4.32	5.33	
LL	.500	.750	12.70	19.05	7, 8
P	.100		2.54		
Q		.040		1.02	5
1	Emitter				
2	Base				
3	Collector				
4	Case				

NOTES:

1. Dimension are in inches.
2. Millimeters are given for general information only.
3. Beyond r (radius) maximum, TH shall be held for a minimum length of .011 (0.28 mm).
4. Dimension TL measured from maximum HD.
5. Body contour optional within zone defined by HD, CD, and Q.
6. Leads at gauge plane .054 +.001 -.000 inch (1.37 +0.03 -0.00 mm) below seating plane shall be within .007 inch (0.18mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC. The device may be measured by direct methods or by the gauge and gauging procedure shown in figure 2.
7. Dimension LU applies between L_1 and L_2. Dimension LD applies between L_2 and LL minimum. Diameter is uncontrolled in L_1 and beyond LL minimum.
8. All four leads.
9. Dimension r (radius) applies to both inside corners of tab.
10. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.
11. Lead 1 = emitter, lead 2 = base, lead 3 = collector, lead 4 = case (electrically connected).