



RF and MICROWAVE DISCRETE LOW POWER TRANSISTORS

Qualified per MIL-PRF-19500/343

DESCRIPTION

The 2N2857UB 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.

FEATURES

- Surface mount equivalent to JEDEC registered 2N2857.
- Silicon NPN, UB 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

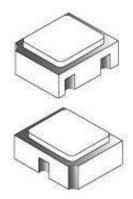
- Low-power, ultra-high frequency transistor.
- Low-profile ceramic surface mount package.

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 _{ÐJA}	400	°C/W	
Thermal Resistance Junction-to-Solder Pad	R _{ejsp}	210	°C/W	
Steady-State Power Dissipation ⁽¹⁾	PD	200	mW	
Collector Current	Ι _C	40	mA	

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

<u>Qualified Levels</u>: JAN, JANTX, and JANTXV



UB Package

Also available in:

TO-72 Package (axial-leaded) 2N2857

MSC – Lawrence

6 Lake Street, Lawrence, MA 01841 Tel: 1-800-446-1158 or (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

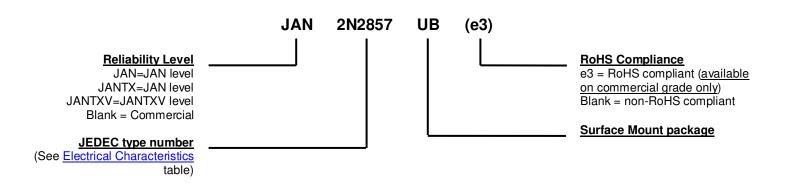




MECHANICAL and PACKAGING

- CASE: Ceramic.
- TERMINALS: Gold plating over nickel underplate. RoHS compliant matte/tin available on commercial grade only.
- MARKING: Part number, date code, manufacturer's ID.
- TAPE & REEL option: Standard per EIA-418D. Consult factory for quantities.
- WEIGHT: < 0.04 Grams.
- See <u>Package Dimensions</u> on last page.

PART NOMENCLATURE



	SYMBOLS & DEFINITIONS							
Symbol	Definition							
Ιc	Collector current (dc).							
I _B	Base current (dc).							
TA	Ambient or free air temperature.							
Tc	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	Cumhal				
Test Conditions	Symbol	Min.	Тур.	Max.	Unit
Collector-Emitter Breakdown Voltage $(I_C = 3.0 \text{ mA}, \text{Bias condition D})$	$V_{(BR)CEO}$	15	-	-	V
Collector to Emitter Cutoff Current $(V_{CE} = 16 \text{ V}, \text{ Bias condition C})$	I _{CES}	-	-	100	nA
Emitter to Base Cutoff Current (V _{EB} = 3 V, Bias condition D)	I _{EBO}	-	-	10	μΑ
Collector to Base Cutoff Current $(V_{CB} = 15 \text{ V}, \text{Bias condition D})$	I _{CBO}	-	-	10	nA

ON CHARACTERISTICS

To at Oan ditions	Symbol				
Test Conditions		Min.	Тур.	Max.	Unit
Forward Current transfer ratio $(I_C = 3.0 \text{ mA}, V_{CE} = 1.0 \text{ V})$	h _{FE}	30	-	150	
Collector-Emitter Saturation Voltage $(I_{C} = 10 \text{ mA}, I_{B} = 1 \text{ mA})$	V _{CE(sat)}		-	0.4	V
Base-Emitter Saturation Voltage $(I_C = 10 \text{ mA}, I_B = 1 \text{ mA})$	V _{BE(sat)}		-	1.0	V

DYNAMIC CHARACTERISTICS

Test Conditions	Symbol		Unit		
Test conditions	Symbol	Min.	Тур.	Max.	Onit
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 ($I_E = 2.0 \text{ mA}, V_{CB} = 6.0 \text{ V}, f = 31.9 \text{ MHz}$)	r _b 'C _c	4	-	15	pF
Collector to Base – feedback capacitance (I_E = 0 mA, V_{CB} = 10 V, 100 kHz \leq f \leq 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) ($I_E = 1.5 \text{ mA}, V_{CE} = 6 \text{ V}, f = 450 \text{ MHz}$	G _{pe}	12.5		21	dB



GRAPHS

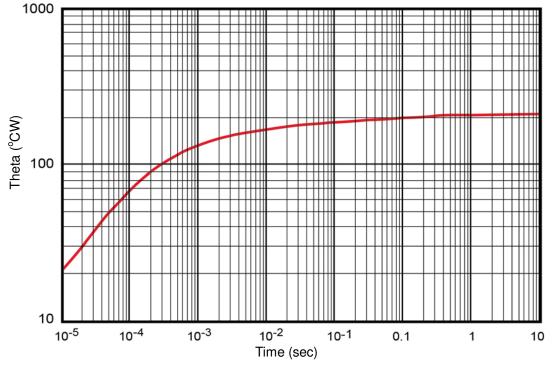
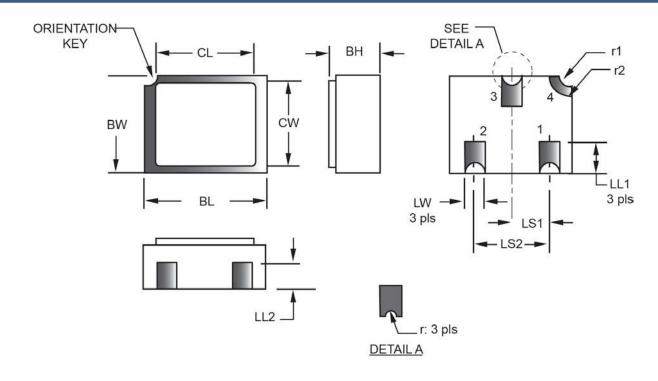


FIGURE 1 Maximum Thermal Impedance



PACKAGE DIMENSIONS



Symbol	Dimensions					Dimensions					
	in	inch		millimeters		Symbol	inch		millimeters		Note
	Min	Max	Min	Max			Min	Max	Min	Max	
BH	.046	.056	1.17	1.42		LS1	.035	.039	0.89	1.02	
BL	.115	.128	2.92	3.25		LS2	.071	.079	1.80	2.01	
BW	.085	.108	2.16	2.74		LW	0.16	0.24	0.41	0.61	
CL		.128		3.25		r		.008		0.20	
CW		.108		2.74		r1		.012		0.31	
LL1	.022	.038	0.56	0.97		r2		.022		.056	
LL2	.017	.035	0.43	0.89							

NOTES:

- 1. Dimensions are in inches.
- 2. Millimeters are given for general information only.
- 3. Hatched areas on package denote metallized areas.
- 4. Pad 1 = Base, Pad 2 = Emitter, Pad 3 = Collector, Pad 4 = Shielding connected to the lid.
- 5. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.