RoHS

Available on commercial versions

NPN/PNP Silicon Complementary Small Signal Dual Transistor

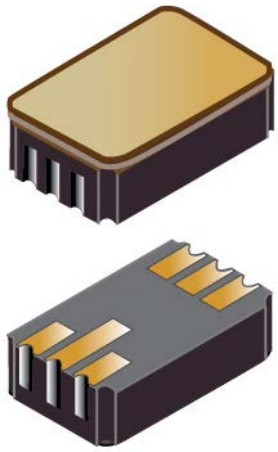
Qualified per MIL-PRF-19500/421

Qualified Levels:
JAN, JANTX, and JANTXV

DESCRIPTION

This 2N4854U device in a low profile 6-pin U package is military qualified up to a JANTXV level for high-reliability 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.



6-Pin "U" Package

FEATURES

- Surface mount equivalent of JEDEC registered 2N4854
- JAN, JANTX, and JANTXV qualifications also available per MIL-PRF-19500/421
- RoHS compliant versions available (commercial grade only)

APPLICATIONS / BENEFITS

- Low-profile and compact package design
- Lightweight

Also available in:

TO-78 package
2N4854

6-Pin Flatpack package
2N3838

MAXIMUM RATINGS

Parameters/Test Conditions	Symbol	Value per		Unit
		Each Transistor	Total Package	
Thermal Resistance Surface Mount Junction-to-Solder Point	$R_{\Theta JSP}$	110	90	ºC/W
Thermal Resistance Junction-to-Ambient (3)	$R_{\Theta JA}$	350	290	ºC/W
Total Power Dissipation @ T_A = +25 ºC (1)	P_T	0.30	0.60	W
Total Power Dissipation @ T_C = +25 ºC (2)	P_T	1.0	2.0	W
Junction and Storage Temperature	T_J and T_{STG}	-65 to +200		ºC
Collector-Base Voltage, Emitter Open	V_{CBO}	60		V
Emitter-Base Voltage, Collector Open	V_{EBO}	5		V
Collector-Emitter Voltage, Base Open	V_{CEO}	40		V
Collector Current, dc	I_C	600		mA
Lead to Case Voltage		+/- 120		V
Solder Temperature @ 10 s		260		^{0}C

Notes:
1. For T_A > +25°C, derate linearly 1.71 mW/°C one transistor, 3.43 mW/°C both transistors.
2. For T_C > +25°C, derate linearly 5.71 mW/°C one transistor, 11.43 mW/°C both transistors.
3. Ambient equates to PCB FR4 mounting ($R_{\Theta JPCB}$) in Figure 2 and MIL-PRF-19500/421.

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MECHANICAL and PACKAGING

- CASE: Hermetically sealed ceramic (black), Au over Ni plated kovar lid
- TERMINALS: Au over Ni plated metallization
- MARKING: Manufacturer's ID, part number, date code
- POLARITY: See case outline.
- WEIGHT: 0.158 grams
- See Package Dimensions on last page.

PART NOMENCLATURE

JAN 2N4854 U (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

Surface Mount package

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.
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_{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_{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.

ELECTRICAL CHARACTERISTICS @ T_A = 25 ºC unless otherwise noted

Characteristics	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Current I_C = 10 mA (pulsed)	$V_{(BR)CEO}$	40		V
Collector-Base Cutoff Current V_{CB} = 60 V	$I_{CBO(1)}$		10	µA
Collector-Base Cutoff Current V_{CB} = 50 V	$I_{CBO(2)}$		10	nA
Emitter-Base Cutoff Current V_{EB} = 5.0 V V_{EB} = 3.0 V	 $I_{EBO(1)}$ $I_{EBO(2)}$		 10 10	 µA nA
ON CHARACTERISTICS				
Forward-Current Transfer Ratio I_C = 150 mA, V_{CE} = 1 V I_C = 100 µA, V_{CE} = 10 V I_C = 1.0 mA, V_{CE} = 10 V I_C = 10 mA, V_{CE} = 10 V I_C = 150 mA, V_{CE} = 10 V I_C = 300 mA, V_{CE} = 10 V	h_{FE}	 50 35 50 75 100 35	 300	
Collector-Emitter Saturation Voltage I_C = 150 mA, I_B = 15 mA	$V_{CE(sat)}$		0.40	V
Base-Emitter Saturation Voltage I_C = 150 mA, I_B = 15 mA	$V_{BE(sat)}$	0.80	1.25	V
DYNAMIC CHARACTERISTICS				
Forward Current Transfer Ratio I_C = 1.0 mA, V_{CE} = 10 V, f = 1.0 kHz	h_{fe}	60	300	
Forward Current Transfer Ratio, Magnitude I_C = 20 mA, V_{CE} = 10 V, f = 100 MHz	$\|h_{fe}\|$	2.0	10	
Small-Signal Common Emitter Input Impedance I_C = 1.0 mA, V_{CE} = 10 V, f = 1.0 kHz	h_{ie}	1.5	9.0	kΩ
Small-Signal Common Emitter Output Admittance I_C = 1.0 mA, V_{CE} = 10 V, f = 1.0 kHz	h_{oe}		50	µhmo
Open Circuit Output Capacitance V_{CB} = 10 V, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz	C_{obo}		8.0	pF
Noise Figure I_C = 100 µA, V_{CE} = 10 V, f = 1.0 kHz, R_G =1.0 kΩ	NF		8.0	dB
SWITCHING CHARACTERISTICS				
Turn-On Time (Saturated) (Reference MIL-PRF-19500/421, figure 7)	t_{on}		45	ns
Turn-Off Time (Saturated) (Reference MIL-PRF-19500/421, figure 8)	t_{off}		300	ns
Pulse Response (Non-Saturated) (Reference MIL-PRF-19500/421, figure 9)	$t_{on} + t_{off}$		18	ns
Collector-Emitter Non-Latching Voltage	V_{CEO}	40		V

GRAPHS

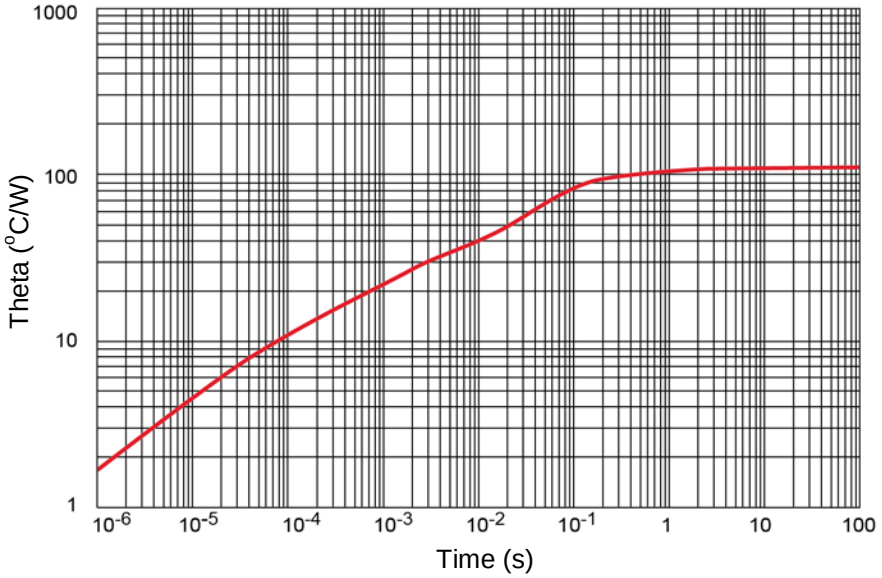


FIGURE 1
Thermal impedance graph ($R_{ØJSP}$)

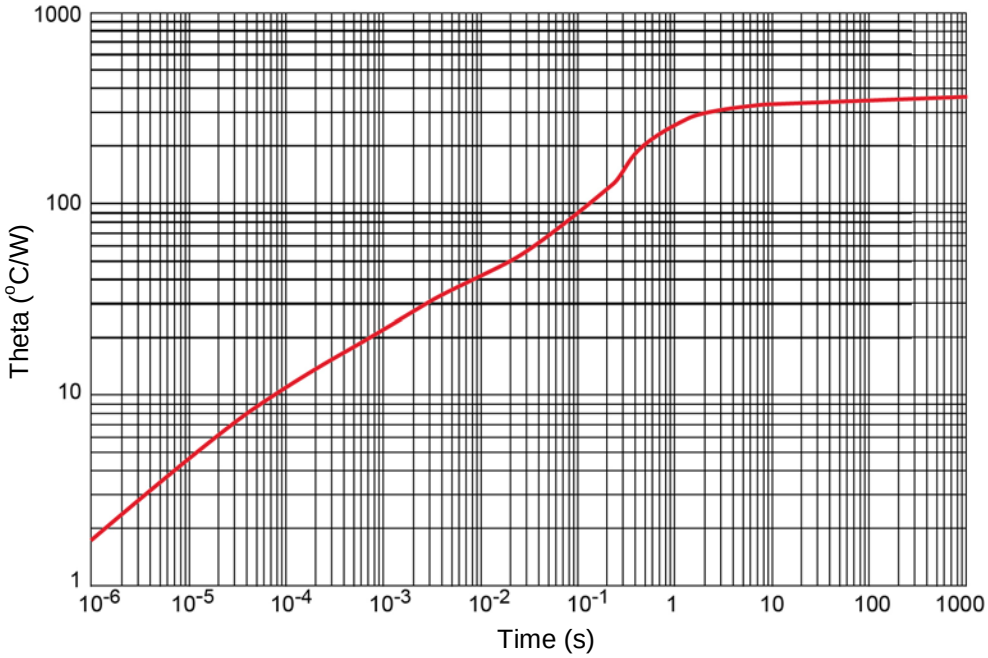
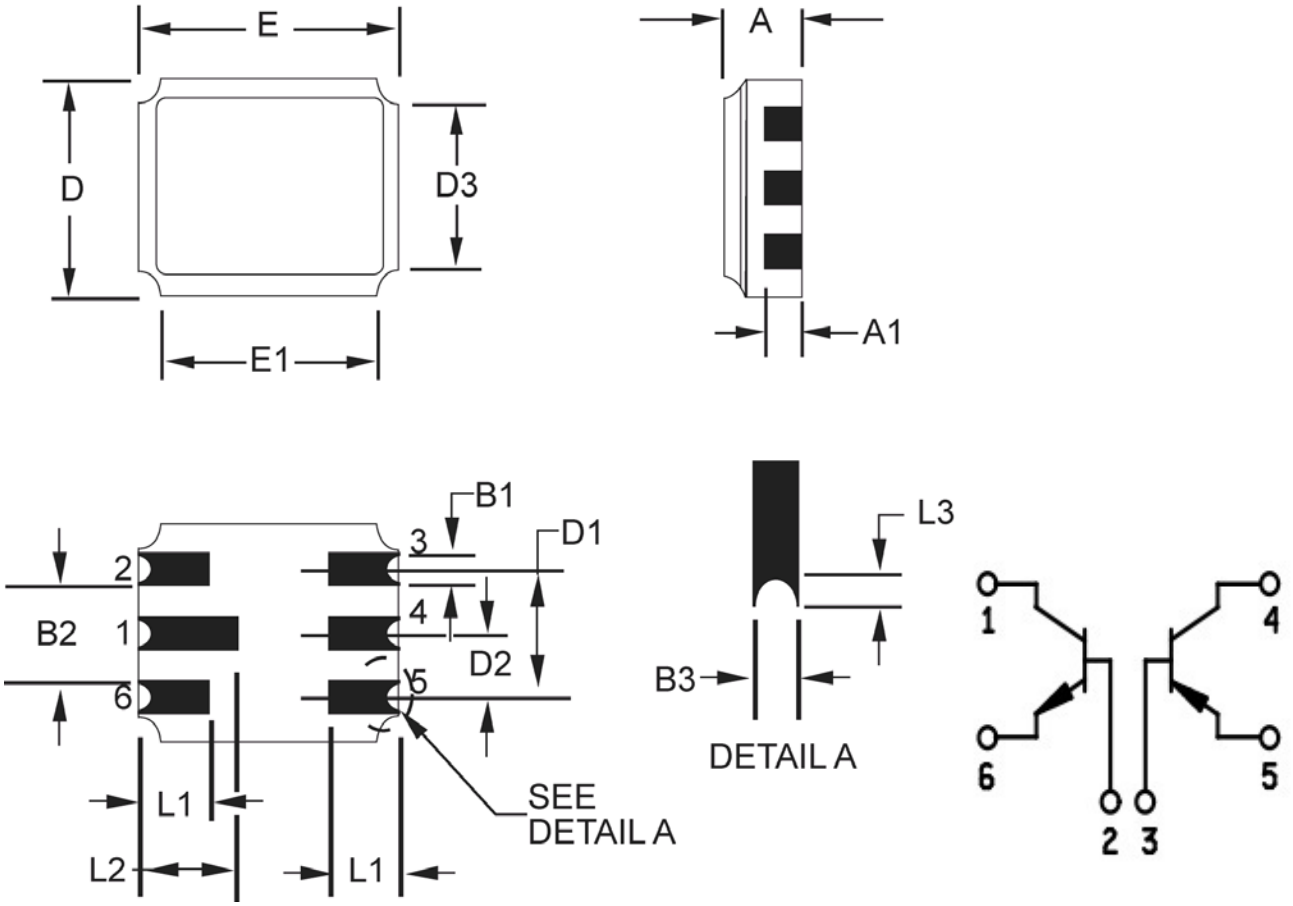


FIGURE 2
Thermal impedance graph ($R_{ØJPCB}$)

PACKAGE DIMENSIONS



Ltr	Dimension				Notes
	Inch		Millimeters		
	Min	Max	Min	Max	
A	.058	.100	1.47	2.54	
A1	.026	.039	0.66	0.99	
B1	.022	.028	0.56	0.71	
B2	.072 Ref.		1.83 Ref.		
B3	.006	.022	0.15	0.56	
D	.165	.175	4.19	4.45	
D1	.095	.105	2.41	2.67	

Ltr	Dimensions				Notes
	Inch		Millimeters		
	Min	Max	Min	Max	
D2	.045	.055	1.14	1.40	
D3		.175		4.45	
E	.240	.250	6.10	6.35	
E1		.250		6.35	
L1	.060	.070	1.52	1.78	
L2	.082	.098	2.08	2.49	
L3	.003	.007	0.08	0.18	

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. The co-planarity deviation of all terminal contact points, as defined by the device seating plane, shall not exceed .006 inch (0.15 mm) for solder dipped leadless chip carriers.

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