Microsemi LAWRENCE

TECHNICAL DATA

NPN/PNP SILICON COMPLEMENTARY SMALL SIGNAL DUAL TRANSISTOR

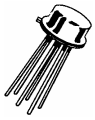
Qualified per MIL-PRF-19500/421

Devices		*Qualified Level*
2N3838	**2N4854** **2N4854U**	**JAN** **JANTX** **JANTXV**

MAXIMUM RATINGS

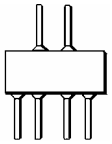
Ratings	Sym	2N3838[2]		2N4854, U		Unit
Collector-Emitter Voltage	V_{CEO}	40		40		Vdc
Collector-Base Voltage	V_{CBO}	60		60		Vdc
Emitter-Base Voltage	V_{EBO}	5.0		5.0		Vdc
Collector Current	I_C	600		600		mAdc
		One Trans	Total Device	One Trans	Total Device	
Total Power Dissipation @ T_A = +25°C @ T_C = + 25°C[1]	P_T	0.25[2] 0.7[4]	0.35 1.4	0.30[3] 1.0[5]	0.60 2.0	W W
Operating & Storage Junction Temp. Range	T_J	200				°C
Operating & Storage Junction Temp. Range	T_{stg}	-55 to +200				°C
Lead to Case Voltage		±120				Vdc

1) T_C rating do not apply to Surface Mount devices (2N4854U)
2) For T_A > +25°C Derate linearly 1.43 mW/°C (one transistor) 2.00 mW/°C (both transistors)
3) For T_A > +25°C Derate linearly 1.71 mW/°C (one transistor) 3.43 mW/°C (both transistors)
4) For T_C > +25°C Derate linearly 4.0 mW/°C (one transistor) 8.0 mW/°C (both transistors)
5) For T_C > +25°C Derate linearly 5.71 mW/°C (one transistor) 11.43 mW/°C (both transistors)



TO-78*
2N4854

6 Pin Surface Mount*
2N4854U



6 Lead Flatpack*
2N3838

*See MILPRF19500/421 for package dimensions.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristics		Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Current I_C = 10 mAdc		$V_{(BR)CEO}$	40		Dc
Collector-Base Cutoff Current V_{CB} = 60 Vdc		$I_{CBO(1)}$		10	µAdc
Collector-Base Cutoff Current V_{CB} = 50 Vdc	2N3838 2N4854, U	$I_{CBO(2)}$		50 10	ηAdc
Emitter-Base Cutoff Current V_{EB} = 5.0 Vdc V_{EB} = 3.0 Vdc		I_{EBO}		10 10	µAdc ηAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS				
Forward-Current Transfer Ratio I_C = 150 mAdc, V_{CE} = 1 Vdc I_C = 100 µAdc, V_{CE} = 10 Vdc I_C = 1.0 mAdc, V_{CE} = 10 Vdc I_C = 10 mAdc, V_{CE} = 10 Vdc I_C = 150 mAdc, V_{CE} = 10 Vdc I_C = 300 mAdc, V_{CE} = 10 Vdc	h_{FE}	 50 35 50 75 100 35	 300	
Collector-Emitter Saturation Voltage I_C = 150 mAdc, I_B = 15 mAdc	$V_{CE(sat)}$		0.40	Vdc
Base-Emitter Saturation Voltage I_C = 150 mAdc, I_B = 15 mAdc	$V_{BE(sat)}$	0.80	1.25	Vdc
DYNAMIC CHARACTERISTICS				
Forward Current Transfer Ratio I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz	h_{fe}	60	300	
Forward Current Transfer Ratio, Magnitude I_C = 20 mAdc, V_{CE} = 10 Vdc, f = 100 MHz	$\lvert h_{fe} \rvert$	2.0	10	
Small-Signal Common Emitter Input Impedance I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz	h_{ie}	1.5	9.0	kΩ
Small-Signal Common Emitter Output Admittance I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz	h_{oe}		50	µhmo
Output Capacitance V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz	C_{obo}		8.0	pF
Noise Figure I_C = 100 µAdc, V_{CE} = 10 Vdc, f = 1.0 kHz, R_G =1.0 kΩ	NF		8.0	dB
SWITCHING CHARACTERISTICS				
Turn-On Time (See Figure 4 of MIL-PRF-19500/421)	^{t}on		45	ηs
Turn-Off Time (See Figure 5 of MIL-PRF-19500/421)	^{t}off		300	ηs
Pulse Response (See Figure 6 of MIL-PRF-19500/421)	$^{t}on + ^{t}off$		18	ηs
Collector-Emitter Non-Latching Voltage (See Figure 7 of MIL-PRF-19500/421)	V_{CEO}	40		Vdc

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