

NPN/PNP SILICON COMPLEMENTARY SMALL SIGNAL DUAL TRANSISTOR

Qualified per MIL-PRF-19500/421

Devices

2N3838

2N4854
2N4854U

Qualified Level

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	
Total Power Dissipation @ T _A = +25°C @ T _C = +25°C ⁽¹⁾	P _T	0.25 ⁽²⁾	0.35	0.30 ⁽³⁾
		0.7 ⁽⁴⁾	1.4	1.0 ⁽⁵⁾
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

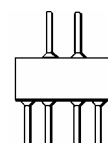
- 1) T_C rating do not apply to Surface Mount devices (2N4854U)
- 2) For T_A > +25°C Derate linearly 1.43 mW/°C (one transistor) 2.00 mW/°C (both transistors)
- 3) For T_A > +25°C Derate linearly 1.71 mW/°C (one transistor) 3.43 mW/°C (both transistors)
- 4) For T_C > +25°C Derate linearly 4.0 mW/°C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

Forward-Current Transfer Ratio $I_C = 150 \text{ mAdc}, V_{CE} = 1 \text{ Vdc}$ $I_C = 100 \text{ } \mu\text{Adc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 150 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 300 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$	h_{FE}	50 35 50 75 100 35	300	
Collector-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$	$V_{CE(sat)}$		0.40	Vdc
Base-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$	$V_{BE(sat)}$	0.80	1.25	Vdc

DYNAMIC CHARACTERISTICS

Forward Current Transfer Ratio $I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$	h_{fe}	60	300	
Forward Current Transfer Ratio, Magnitude $I_C = 20 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 100 \text{ MHz}$	$ h_{fe} $	2.0	10	
Small-Signal Common Emitter Input Impedance $I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$	h_{je}	1.5	9.0	k Ω
Small-Signal Common Emitter Output Admittance $I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$	h_{oe}		50	μhmo
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{obo}		8.0	pF
Noise Figure $I_C = 100 \text{ } \mu\text{Adc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}, R_G = 1.0 \text{ k}\Omega$	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