

NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/544

DEVICES

2N5152 2N5154
 2N5152L 2N5154L
 2N5152U3 2N5154U3

LEVELS

JAN
 JANTX
 JANTXV
 JANS

ABSOLUTE MAXIMUM RATINGS ($T_C = +25^\circ\text{C}$ unless otherwise noted)

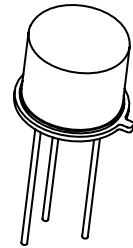
Parameters / Test Conditions	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	80	Vdc
Collector-Base Voltage	V_{CBO}	100	Vdc
Emitter-Base Voltage	V_{EBO}	5.5	Vdc
Collector Current	I_C	2.0	Adc
Total Power Dissipation ⁽¹⁾ @ $T_A = +25^\circ\text{C}$ @ $T_C = +25^\circ\text{C}$	P_T	1.0 10	W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$
Thermal Resistance, Junction-to Case ⁽¹⁾	$R_{\theta JC}$	10 1.7 (U3)	$^\circ\text{C/W}$

Note:

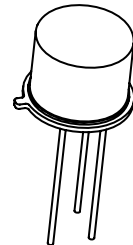
- See 19500/544 for thermal derating curves.
- This value applies for $P_W \leq 8.3\text{ms}$, duty cycle $\leq 1\%$.

ELECTRICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, unless otherwise noted)

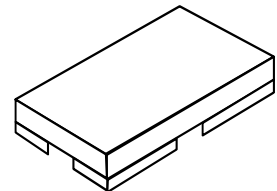
Parameters / Test Conditions	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage $I_C = 100\text{mAdc}, I_B = 0$	$V_{(BR)CEO}$	80		Vdc
Emitter-Base Cutoff Current $V_{EB} = 4.0\text{Vdc}, I_C = 0$ $V_{EB} = 5.5\text{Vdc}, I_C = 0$	I_{EBO}		1.0 1.0	μAdc mAdc
Collector-Emitter Cutoff Current $V_{CE} = 60\text{Vdc}, V_{BE} = 0$ $V_{CE} = 100\text{Vdc}, V_{BE} = 0$	I_{CES}		1.0 1.0	μAdc mAdc
Collector-Emitter Cutoff Current $V_{CE} = 40\text{Vdc}, I_B = 0$	I_{CEO}		50	μAdc
ON CHARACTERISTICS				
Forward-Current Transfer Ratio $I_C = 50\text{mAdc}, V_{CE} = 5\text{Vdc}$	h_{FE}	20	---	
		50	---	
$I_C = 2.5\text{Adc}, V_{CE} = 5\text{Vdc}$		30	90	
		70	200	



TO-5
2N5152L, 2N5154L



TO-39 (TO-205AD)
2N5152, 2N5154



U-3
2N5152U3, 2N5154U3

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ELECTRICAL CHARACTERISTICS (con't)

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
$I_C = 5\text{A dc}$, $V_{CE} = 5\text{V dc}$ 2N5152 2N5154	h_{FE}	20 40		
Collector-Emitter Saturation Voltage $I_C = 2.5\text{A dc}$, $I_B = 250\text{mA dc}$ $I_C = 5.0\text{A dc}$, $I_B = 500\text{mA dc}$	$V_{CE(sat)}$		0.75 1.5	Vdc
Base-Emitter Voltage Non-Saturation $I_C = 2.5\text{A dc}$, $V_{CE} = 5\text{V dc}$	V_{BE}		1.45	Vdc
Base-Emitter Saturation Voltage $I_C = 2.5\text{A dc}$, $I_B = 250\text{mA dc}$ $I_C = 5.0\text{A dc}$, $I_B = 500\text{mA dc}$	$V_{BE(sat)}$		1.45 2.2	Vdc

DYNAMIC CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 500\text{mA dc}$, $V_{CE} = 5\text{V dc}$, $f = 10\text{MHz}$ 2N5152 2N5154	$ h_{fe} $	6 7		
Small-signal short Circuit Forward-Current Transfer Ratio $I_C = 100\text{mA dc}$, $V_{CE} = 5\text{V dc}$, $f = 1\text{KHz}$ 2N5152 2N5154	h_{fe}	20 50		
Output Capacitance $V_{CB} = 10\text{V dc}$, $I_E = 0$, $f = 1.0\text{MHz}$	C_{obo}		250	pF

SWITCHING CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Turn-On Time $I_C = 5\text{A dc}$, $I_{B1} = 500\text{mA dc}$	t_{on}		0.5	μs
Turn-Off Time $R_L = 6\Omega$	t_{off}		1.5	μs
Storage Time $I_{B2} = -500\text{mA dc}$	t_s		1.4	μs
Fall Time $V_{BE(OFF)} = 3.7\text{V dc}$	t_f		0.5	μs

SAFE OPERATING AREA

DC Tests $T_C = +25^\circ\text{C}$, 1 Cycle, $t_p = 1.0\text{s}$ Test 1 $V_{CE} = 5.0\text{V dc}$, $I_C = 2.0\text{A dc}$ Test 2 $V_{CE} = 32\text{V dc}$, $I_C = 310\text{mA dc}$ Test 3 $V_{CE} = 80\text{V dc}$, $I_C = 12.5\text{mA dc}$
