

NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/544

Devices

2N5152
2N5152L

2N5154
2N5154L

Qualified Level

JAN
JANTX
JANTXV

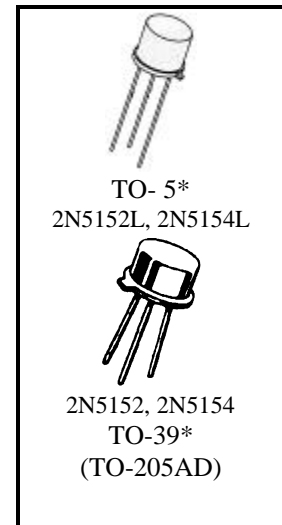
MAXIMUM RATINGS

Ratings	Symbol	All Units	Units
Collector-Emitter Voltage	V_{CEO}	80	Vdc
Collector-Base Voltage	V_{CBO}	100	Vdc
Emitter-Base Voltage	V_{EBO}	5.5	Vdc
Collector Current	$I_C^{(3,4)}$	2.0	Adc
Total Power Dissipation	P_T	@ $T_A = +25^{\circ}C^{(1)}$	1.0
		@ $T_C = +25^{\circ}C^{(2)}$	11.8
Operating & Storage Temperature Range	T_j, T_{stg}	-65 to +200	$^{\circ}C$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	15	$^{\circ}C/W$

- 1) Derate linearly 5.7 mW/ $^{\circ}C$ for $T_A > +25^{\circ}C$
- 2) Derate linearly 66.7 mW/ $^{\circ}C$ for $T_C > +25^{\circ}C$
- 3) Derate linearly 80 mW/ $^{\circ}C$ for $T_C > +25^{\circ}C$
- 4) This value applies for $P_W \leq 8.3$ ms, duty cycle $\leq 1\%$



*See appendix A for package outline

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

Characteristics	Symbol	Min.	Max.	Unit
-----------------	--------	------	------	------

OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage $I_C = 100$ mAdc, $I_B = 0$	$V_{(BR)CEO}$	80		Vdc
Emitter-Base Cutoff Current $V_{EB} = 4.0$ Vdc, $I_C = 0$ $V_{EB} = 5.5$ Vdc, $I_C = 0$	I_{EBO}		1.0	μ Adc
			1.0	mAdc
Collector-Emitter Cutoff Current $V_{CE} = 60$ Vdc, $V_{BE} = 0$ $V_{CE} = 100$ Vdc, $V_{BE} = 0$	I_{CES}		1.0	μ Adc
			1.0	mAdc
Collector-Base Cutoff Current $V_{CE} = 40$ Vdc, $I_B = 0$	I_{CEO}		50	μ Adc

2N5152, 2N5154 JAN SERIES

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS				
Forward Current Transfer Ratio $I_C = 50 \text{ mAdc}, V_{CE} = 5 \text{ Vdc}$ 2N5152 2N5154	h_{FE}	20		
$I_C = 2.5 \text{ Adc}, V_{CE} = 5 \text{ Vdc}$ 2N5152 2N5154		30	90	
$I_C = 5 \text{ Adc}, V_{CE} = 5 \text{ Vdc}$ 2N5152 2N5154		70	200	
$I_C = 5 \text{ Adc}, V_{CE} = 5 \text{ Vdc}$ 2N5152 2N5154		20	40	
Collector-Emitter Saturation Voltage $V_{CE} = 5 \text{ Vdc}, I_C = 2.5 \text{ Adc}$ $I_C = 5 \text{ Adc}, I_B = 500 \text{ Adc}$	$V_{CE(sat)}$		0.75 1.5	Vdc
Base-Emitter Voltage non-saturated $I_C = 2.5 \text{ Adc}, I_B = 250 \text{ mAdc}$ $I_C = 5 \text{ Adc}, I_B = 500 \text{ mAdc}$	V_{BE}		1.45	Vdc
Base-Emitter Saturation Voltage $I_C = 2.5 \text{ Adc}, I_B = 250 \text{ mAdc}$ $I_C = 5 \text{ Adc}, I_B = 500 \text{ mAdc}$	$V_{BE(sat)}$		1.45 2.2	Vdc

DYNAMIC CHARACTERISTICS

Magnitude of Common Emitter Small-Signal Short Circuit Forward-Current Transfer Ratio $I_C = 500 \text{ mAdc}, V_{CE} = 5 \text{ Vdc}, f = 10 \text{ MHz}$ 2N5152 2N5154	$ h_{fe} $	6 7		
Small-Signal Short Circuit Forward-Current Transfer Ratio $I_C = 100 \text{ mAdc}, V_{CE} = 5 \text{ Vdc}, f = 1 \text{ kHz}$ 2N5152 2N5154	h_{fe}	20 50		
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$	C_{obo}		250	pF

SWITCHING CHARACTERISTICS

Turn-On Time $I_C = 5 \text{ Adc}, I_{B1} = 500 \text{ mAdc}$	t_{on}		0.5	μs
Turn-Off Time $R_L = 6\Omega$	t_{off}		1.5	μs
Storage Time $I_{B2} = -500 \text{ mAdc}$	t_s		1.4	μs
Fall Time $V_{BE(OFF)} = 3.7 \text{ Vdc}$	t_f		0.5	μs

SAFE OPERATING AREA

DC Tests $T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t_p = 1.0 \text{ s}$				
Test 1 $V_{CE} = 5.8 \text{ Vdc}, I_C = 2.0 \text{ Adc}$				
Test 2 $V_{CE} = 32 \text{ Vdc}, I_C = 340 \text{ mAdc}$				
Test 3 $V_{CE} = 80 \text{ Vdc}, I_C = 20 \text{ mAdc}$				