

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 @ $T_A = +25^{\circ}\text{C}^{(1)}$ @ $T_C = +25^{\circ}\text{C}^{(2)}$	P_T	1.0 11.8	W W
Operating & Storage Temperature Range	T_j, T_{stg}	-65 to +200	$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

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

1) Derate linearly 5.7 mW/ $^{\circ}\text{C}$ for $T_A > +25^{\circ}\text{C}$

2) Derate linearly 66.7 mW/ $^{\circ}\text{C}$ for $T_C > +25^{\circ}\text{C}$

3) Derate linearly 80 mW/ $^{\circ}\text{C}$ for $T_C > +25^{\circ}\text{C}$

4) This value applies for $P_W \leq 8.3$ ms, duty cycle $\leq 1\%$



TO- 5*
 2N5152L, 2N5154L



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

*See appendix A for
 package outline

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

Characteristics	Symbol	Min.	Max.	Unit
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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 1.0	μAdc mAdc
Collector-Emitter Cutoff Current $V_{CE} = 60$ Vdc, $V_{BE} = 0$ $V_{CE} = 100$ Vdc, $V_{BE} = 0$	I_{CES}		1.0 1.0	μAdc mAdc
Collector-Base Cutoff Current $V_{CE} = 40$ Vdc, $I_B = 0$	I_{CEO}		50	μAdc

2N5152, 2N5154 JAN SERIES

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS				
Forward Current Transfer Ratio I _C = 50 mAdc, V _{CE} = 5 Vdc 2N5152 2N5154	h _{FE}	20 50		
I _C = 2.5 Adc, V _{CE} = 5 Vdc 2N5152 2N5154		30 70	90 200	
I _C = 5 Adc, V _{CE} = 5 Vdc 2N5152 2N5154		20 40		
Collector-Emitter Saturation Voltage V _{CE} = 5 Vdc, I _C = 2.5 Adc I _C = 5 Adc, I _B = 500 Adc	V _{CE(sat)}		0.75 1.5	Vdc
Base-Emitter Voltage non-saturated I _C = 2.5 Adc, I _B = 250 mAdc I _C = 5 Adc, I _B = 500 mAdc	V _{BE}		1.45	Vdc
Base-Emitter Saturation Voltage I _C = 2.5 Adc, I _B = 250 mAdc I _C = 5 Adc, I _B = 500 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 mAdc, V _{CE} = 5 Vdc, f = 10 MHz 2N5152 2N5154	h _{fe}	6 7		
Small-Signal Short Circuit Forward-Current Transfer Ratio I _C = 100 mAdc, V _{CE} = 5 Vdc, f = 1 kHz 2N5152 2N5154	h _{fe}	20 50		
Output Capacitance V _{CB} = 10 Vdc, I _E = 0, f = 1.0 MHz	C _{obo}		250	pF

SWITCHING CHARACTERISTICS

Turn-On Time I _C = 5 Adc, I _{B1} = 500 mAdc	t _{on}		0.5	μs
Turn-Off Time R _L = 6Ω	t _{off}		1.5	μs
Storage Time I _{B2} = -500 mAdc	t _s		1.4	μs
Fall Time V _{BE(OFF)} = 3.7 Vdc	t _f		0.5	μs

SAFE OPERATING AREA

DC Tests T _C = +25°C, 1 Cycle, t _p = 1.0 s Test 1 V _{CE} = 5.8Vdc, I _C = 2.0 Adc Test 2 V _{CE} = 32 Vdc, I _C = 340 mAdc Test 3 V _{CE} = 80 Vdc, I _C = 20 mAdc				
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