Microsemi LAWRENCE

TECHNICAL DATA

PNP POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/545

Devices		*Qualified Level*
2N5151	**2N5153**	**JAN**
2N5151L	**2N5153L**	**JANTX**
		JANTXV

MAXIMUM RATINGS

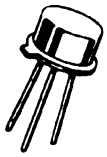
Ratings	Symbol	All Units	Units
Collector-Emitter Voltage	V_{CEO}	80	Vdc
Collector-Base Voltage	V_{CBO}	100	Vdc
Emitter-Base Voltage	V_{EBO}	5.5	Vdc
Collector Current	I_C (3, 4)	2.0	Adc
Total Power Dissipation @ $T_A = +25^0C$ (1) @ $T_C = +25^0C$ (2)	P_T	1.0 11.8	W W
Operating & Storage Temperature Range	T_j, T_{stg}	-65 to +200	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	15	$^0C/W$

1) Derate linearly 5.7 mW/^{0}C for $T_A > +25^0C$
2) Derate linearly 66.7 mW/^{0}C for $T_C > +25^0C$
3) Derate linearly 6.67 mW/^{0}C for $T_A > +25^0C$
4) Derate linearly 80 mW/^{0}C for $T_C > +25^0C$

TO- 5*
2N5151L, 2N5153L



2N5151, 2N5153
TO-39*
(TO-205AD)

*See appendix A for package outline

ELECTRICAL CHARACTERISTICS ($T_C = 25^0C$ 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 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

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS				
Forward Current Transfer Ratio				
I_C = 50 mAdc, V_{CE} = 5 Vdc 2N5151		20		
2N5153		50		
I_C = 2.5 Adc, V_{CE} = 5 Vdc				
2N5151	h_{FE}	30	90	
2N5153		70	200	
I_C = 5 Adc, V_{CE} = 5 Vdc				
2N5151		20		
2N5153		40		
Collector-Emitter Saturation Voltage				
I_C = 2.5 Adc, I_B = 250 Adc	$V_{CE(sat)}$		0.75	Vdc
I_C = 5 Adc, I_B = 500 Adc			1.5	
Base-Emitter Voltage nonsaturated				
V_{CE} = 5 Vdc, I_C = 2.5 Adc	V_{BE}		1.45	Vdc
Base-Emitter Saturation Voltage				
I_C = 2.5 Adc, I_B = 250 mAdc	$V_{BE(sat)}$		1.45	Vdc
I_C = 5 Adc, I_B = 500 mAdc			2.2	
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				
2N5151	$\lvert h_{fe} \rvert$	6		
2N5153		7		
Common-Emitter Small-Signal Short-Circuit Forward-Current Transfer Ratio				
I_C = 100 mAdc, V_{CE} = 5 Vdc, f = 1 kHz				
2N5151	h_{fe}	20		
2N5151		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^{0}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