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TECHNICAL DATA SHEET

NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/534

DEVICES

2N5002 2N5004

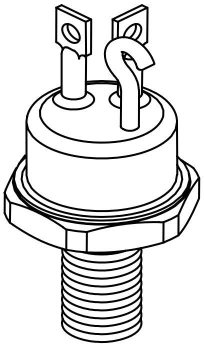
LEVELS

JAN
JANTX
JANTXV
JANS

ABSOLUTE MAXIMUM RATINGS *(T_C = +25°C unless otherwise noted)*

Parameters / Test Conditions	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	80	V
Collector-Base Voltage	V_{CBO}	100	V
Emitter-Base Voltage	V_{EBO}	5.5	V
Collector Current	I_C I_C (3)	5.0 10	A
Total Power Dissipation @ T_A = +25°C (1) @ T_C = +25°C (2)	P_T	2.0 58	W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	°C
Thermal Resistance, Junction-to Case	$R_{\theta JC}$	3.0	°C/W
Thermal Resistance, Junction-to Ambient	$R_{\theta JA}$	88	°C/W

Note:
1) Derate linearly 11.4 mW/°C for $T_A > +25°C$
2) Derate linearly 331 mW/°C for $T_C > +25°C$
3) This value applies for $P_W \leq 8.3$ ms, duty cycle ≤ 1%



TO-59

ELECTRICAL CHARACTERISTICS *(T_A = +25°C, unless otherwise noted)*

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage I_C = 100mAdc	$V_{(BR)CEO}$	80		Vdc
Collector-Emitter Cutoff Current V_{CE} = 40Vdc, I_B = 0	I_{CEO}		50	µAdc
Collector-Emitter Cutoff Current V_{CE} = 60Vdc, V_{BE} = 0Vdc V_{CE} = 100Vdc, V_{BE} = 0Vdc	I_{CES}		1.0 1.0	µAdc mAdc
Emitter-Base Cutoff Current V_{BE} = 4.0Vdc, I_C = 0 V_{BE} = 5.5Vdc, I_C = 0	I_{EBO}		1.0 1.0	mAdc

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DYNAMIC CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Forward-Current Transfer Ratio		h_{FE}			
I_C = 50mAdc, V_{CE} = 5.0Vdc	2N5002		20	---	
I_C = 2.5Adc, V_{CE} = 5.0Vdc			30	90	
I_C = 5.0Adc, V_{CE} = 5.0Vdc			20	---	
I_C = 50mAdc, V_{CE} = 5.0Vdc	2N5004		50	---	
I_C = 2.5Adc, V_{CE} = 5.0Vdc			70	200	
I_C = 5.0Adc, V_{CE} = 5.0Vdc			40	---	
Base-Emitter Voltage Non-Saturated V_{CE} = 5.0Vdc, I_C = 2.5Adc		V_{BE}		1.45	Vdc
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$			Vdc
I_C = 2.5Adc, I_B = 250mAdc				0.75	
I_C = 5.0Adc, I_B = 500mAdc				1.5	
Base-Emitter Saturation Voltage		$V_{BE(sat)}$			Vdc
I_C = 2.5Adc, I_B = 250mAdc				1.45	
I_C = 5.0Adc, I_B = 500mAdc				2.2	

DYNAMIC CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Magnitude of Common Emitter Small-Signal Short-Circuit. Forward Current Transfer Ratio		$\lvert h_{fe} \rvert$			
I_C = 500mA, V_{CE} = 5.0Vdc, f = 10MHz	2N5002		6.0		
	2N5004		7.0		
Output Capacitance V_{CB} = 10Vdc		C_{obo}		250	pF

SWITCHING CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Turn-On Time	I_C = 5Adc; I_{B1} = 500mAdc	t_{on}		0.5	µs
Storage Time	I_{B2} = -500mAdc	t_s		1.4	µs
Fall Time	$V_{BE(OFF)}$ = 3.7Vdc	t_f		0.5	µs
Turn-Off Time	R_L = 6Ω	t_{off}		1.5	µs

SAFE OPERATING AREA

DC Tests

T_C = +25°C, V_{CE} = 0, tp = 1s, 1 Cycle

Test 1

V_{CE} = 12Vdc, I_C = 5.0Adc

Test 2

V_{CE} = 32Vdc, I_C = 1.7Adc

Test 3

V_{CE} = 80Vdc, I_C = 100mAdc