



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/534

DEVICES

2N5002 2N5004

LEVELS

**JAN
 JANTX
 JANTXV
 JANS**

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

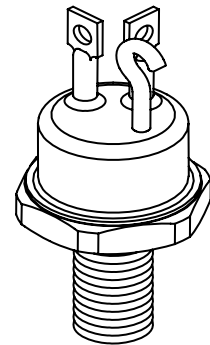
Parameters / Test Conditions	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	80	V
Collector-Base Voltage	V_{CBO}	100	V
Emitter-Base Voltage	V_{EBO}	5.5	V
Collector Current	$I_C^{(3)}$	5.0 10	A
Total Power Dissipation @ $T_A = +25^\circ\text{C}^{(1)}$ @ $T_C = +25^\circ\text{C}^{(2)}$	P_T	2.0 58	W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

Note:

- 1) Derate linearly 11.4 mW/ $^\circ\text{C}$ for $T_A > +25^\circ\text{C}$
- 2) Derate linearly 331 mW/ $^\circ\text{C}$ for $T_C > +25^\circ\text{C}$
- 3) This value applies for $P_W \leq 8.3$ 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 $I_C = 100\text{mA dc}$	$V_{(BR)CEO}$	80		Vdc
Collector-Emitter Cutoff Current $V_{CE} = 40\text{Vdc}, I_B = 0$	I_{CEO}		50	$\mu\text{A dc}$
Collector-Emitter Cutoff Current $V_{CE} = 60\text{Vdc}, V_{BE} = 0\text{Vdc}$ $V_{CE} = 100\text{Vdc}, V_{BE} = 0\text{Vdc}$	I_{CES}		1.0 1.0	$\mu\text{A dc}$ mA dc
Emitter-Base Cutoff Current $V_{BE} = 4.0\text{Vdc}, I_C = 0$ $V_{BE} = 5.5\text{Vdc}, I_C = 0$	I_{EBO}		1.0 1.0	mA dc



TO-59

NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/534

DYNAMIC CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Forward-Current Transfer Ratio $I_C = 50\text{mA}$, $V_{CE} = 5.0\text{Vdc}$ $I_C = 2.5\text{A}$, $V_{CE} = 5.0\text{Vdc}$ $I_C = 5.0\text{A}$, $V_{CE} = 5.0\text{Vdc}$	h_{FE}	20	---	
2N5002		30	90	
		20	---	
$I_C = 50\text{mA}$, $V_{CE} = 5.0\text{Vdc}$ $I_C = 2.5\text{A}$, $V_{CE} = 5.0\text{Vdc}$ $I_C = 5.0\text{A}$, $V_{CE} = 5.0\text{Vdc}$	2N5004	50	---	
		70	200	
		40	---	
Base-Emitter Voltage Non-Saturated $V_{CE} = 5.0\text{Vdc}$, $I_C = 2.5\text{A}$	V_{BE}		1.45	Vdc
Collector-Emitter Saturation Voltage $I_C = 2.5\text{A}$, $I_B = 250\text{mA}$ $I_C = 5.0\text{A}$, $I_B = 500\text{mA}$	$V_{CE(sat)}$		0.75 1.5	Vdc
Base-Emitter Saturation Voltage $I_C = 2.5\text{A}$, $I_B = 250\text{mA}$ $I_C = 5.0\text{A}$, $I_B = 500\text{mA}$	$V_{BE(sat)}$		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 $I_C = 500\text{mA}$, $V_{CE} = 5.0\text{Vdc}$, $f = 10\text{MHz}$	$ h_{fe} $	6.0		
2N5002 2N5004		7.0		
Output Capacitance $V_{CB} = 10\text{Vdc}$	C_{obo}		250	pF

SWITCHING CHARACTERISTICS

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

SAFE OPERATING AREA

DC Tests $T_C = +25^\circ\text{C}$, $V_{CE} = 0$, $t_p = 1\text{s}$, 1 Cycle Test 1 $V_{CE} = 12\text{Vdc}$, $I_C = 5.0\text{A}$ Test 2 $V_{CE} = 32\text{Vdc}$, $I_C = 1.7\text{A}$ Test 3 $V_{CE} = 80\text{Vdc}$, $I_C = 100\text{mA}$
--