



勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
 Http://www.100y.com.tw

TECHNICAL DATA

NPN SILICON TRANSISTOR

Qualified per MIL-PRF-19500/366

Devices

2N3498	2N3499	2N3500	2N3501
2N3498L	2N3499L	2N3500L	2N3501L

Qualified Level

JAN
JANTX
JANTXV
JANS

MAXIMUM RATINGS

Ratings	Symbol	2N3498* 2N3499*	2N3500* 2N3501*	Unit
Collector-Emitter Voltage	V_{CEO}	100	150	Vdc
Collector-Base Voltage	V_{CBO}	100	150	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	6.0	Vdc
Collector Current	I_C	500	300	mAdc
Total Power Dissipation	P_T	@ $T_A = 25^\circ\text{C}$ ⁽¹⁾	1.0	W
		@ $T_C = 25^\circ\text{C}$ ⁽²⁾	5.0	W
Operating & Storage Junction Temp. Range	T_J, T_{stg}	-55 to +200		$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance: Junction-to-Case	$R_{\theta JC}$	35	$^\circ\text{C/W}$
Junction-to-Ambient	$R_{\theta JA}$	175	

*Electrical characteristics for "L" suffix devices are identical to the "non L" corresponding devices

1) Derate linearly 5.71 W/ $^\circ\text{C}$ for $T_A > 25^\circ\text{C}$

2) Derate linearly 28.6 W/ $^\circ\text{C}$ for $T_C > 25^\circ\text{C}$



TO-5*
 2N3498L, 2N3499L
 2N3500L, 2N3501L



TO-39* (TO-205AD)
 2N3498, 2N3499
 2N3500, 2N3501

*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 $I_C = 10 \text{ mAdc}$	2N3498, 2N3499 2N3500, 2N3501	$V_{(BR)CEO}$	100 150	Vdc
Collector-Base Cutoff Current $V_{CB} = 50 \text{ Vdc}$ $V_{CB} = 75 \text{ Vdc}$ $V_{CB} = 100 \text{ Vdc}$ $V_{CB} = 150 \text{ Vdc}$	2N3498, 2N3499 2N3500, 2N3501 2N3498, 2N3499 2N3500, 2N3501	I_{CBO}	50 50 10 10	ηAdc ηAdc μAdc μAdc
Emitter-Base Cutoff Current $V_{EB} = 4.0 \text{ Vdc}$ $V_{EB} = 6.0 \text{ Vdc}$		I_{EBO}	25 10	ηAdc μAdc

2N3498, L, 2N3499, L, 2N3500, L, 2N3501, L JAN SERIES

ELECTRICAL CHARACTERISTICS (con't)

Characteristics		Symbol	Min.	Max.	Unit
ON CHARACTERISTICS ⁽³⁾					
Forward-Current Transfer Ratio I _C = 0.1 mAdc, V _{CE} = 10 Vdc	2N3498, 2N3500 2N3499, 2N3501	h _{FE}	20 35		
I _C = 1.0 mAdc, V _{CE} = 10 Vdc	2N3498, 2N3500 2N3499, 2N3501		25 50		
I _C = 10 mAdc, V _{CE} = 10 Vdc	2N3498, 2N3500 2N3499, 2N3501		35 75		
I _C = 150 mAdc, V _{CE} = 10 Vdc	2N3498, 2N3500 2N3499, 2N3501		40 100	120 300	
I _C = 300 mAdc, V _{CE} = 10 Vdc	2N3500 2N3501		15 20		
I _C = 500 mAdc, V _{CE} = 10 Vdc	2N3498 2N3499		15 20		
Collector-Emitter Saturation Voltage I _C = 10 mAdc, I _B = 1.0 mAdc I _C = 300 mAdc, I _B = 30 mAdc I _C = 150 mAdc, I _B = 15 mAdc	All Types 2N3498, 2N349 2N3500, 2N3501		V _{CE(sat)}		0.2 0.6 0.4
Base-Emitter Saturation Voltage I _C = 10 mAdc, I _B = 1.0 mAdc I _C = 300 mAdc, I _B = 30 mAdc I _C = 150 mAdc, I _B = 15 mAdc	All Types 2N3498, 2N3499 2N3500, 2N3501	V _{BE(sat)}		0.8 1.4 1.2	Vdc

DYNAMIC CHARACTERISTICS

Forward Current Transfer Ratio, Magnitude I _C = 20 mAdc, V _{CE} = 20 Vdc, f = 100 MHz		h _{fe}	1.5	8.0	
Output Capacitance V _{CB} = 10 Vdc, I _E = 0, 100 kHz ≤ f ≤ 1.0 MHz	2N3498, 2N3499 2N3500, 2N3501	C _{obo}		10 8.0	pF
Input Capacitance V _{EB} = 0.5 Vdc, I _C = 0, 100 kHz ≤ f ≤ 1.0 MHz		C _{ibo}		80	pF

SWITCHING CHARACTERISTICS

Turn-On Time V _{EB} = 5 Vdc; I _C = 150 mAdc; I _{B1} = 15 mAdc		t _{on}		115	ns
Turn-Off Time I _C = 150 mAdc; I _{B1} = I _{B2} = -15 mAdc		t _{off}		1150	ns

SAFE OPERATING AREA

DC Tests					
T _C = +25°C, t _r ≥ 10 ns; 1 Cycle, t = 1.0 s					
Test 1					
V _{CE} = 10 Vdc, I _C = 500 mAdc	2N3498, 2N3499				
V _{CE} = 16.67 Vdc, I _C = 300 mAdc	2N3500, 2N3501				
Test 2					
V _{CE} = 50 Vdc, I _C = 100 mAdc	All Types				
Test 3					
V _{CE} = 80 Vdc, I _C = 40 mAdc	All Types				
Clamped Switching					
T _A = +25°C					
Test 1					
I _B = 85 mAdc, I _C = 500 mAdc	2N3498, 2N3499				
I _B = 50 mAdc, I _C = 300 mAdc	2N3500, 2N3501				

(3) Pulse Test: Pulse Width = 300μs, Duty Cycle ≤ 2.0%.

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Datasheets for electronics components.

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