

2N5302 JANTX, TXV 2N5303 JANTX, TXV

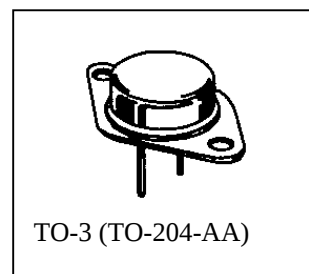
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NPN SILICON HIGH-POWER TRANSISTOR

MAXIMUM RATINGS

Ratings	Symbol	2N5302	2N5303	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	Vdc
Collector-Base Voltage	V_{CBO}	60	80	Vdc
Emitter-Base Voltage	V_{EBO}	5.0		Vdc
Collector Current	I_C	30	20	Adc
Base Current	I_B	7.5		Adc
Total Power Dissipation @ $T_A = 25^{\circ}\text{C}^{(1)}$ @ $T_C = 100^{\circ}\text{C}^{(2)}$	P_T	5.0 115		W W/ $^{\circ}\text{C}$
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		$^{\circ}\text{C}$



THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.875	$^{\circ}\text{C/W}$

1) Derate linearly 28.57 mW/ $^{\circ}\text{C}$ for $T_A > 25^{\circ}\text{C}$

2) Derate linearly 1.14 W/ $^{\circ}\text{C}$ for $T_C > 100^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Current $I_C = 200 \text{ mAdc}, I_B = 0$	2N5302 2N5303	$V_{(BR)CEO}$	60 80	Vdc
Collector-Emitter Cutoff Current $V_{CE} = 60 \text{ Vdc}, I_B = 0$ $V_{CE} = 80 \text{ Vdc}, I_B = 0$	2N5302 2N5303	I_{CEO}	10 10	μAdc
Emitter-Base Cutoff Current $V_{EB} = 5.0 \text{ Vdc}, I_C = 0$		I_{EBO}	5.0	μAdc
Collector-Emitter Cutoff Current $V_{BE} = 1.5 \text{ Vdc}, V_{CE} = 60 \text{ Vdc}$ $V_{BE} = 1.5 \text{ Vdc}, V_{CE} = 80 \text{ Vdc}$	2N5302 2N5303	I_{CEX}	5.0 5.0	μAdc
Collector-Emitter Cutoff Current $V_{CE} = 60 \text{ Vdc}$ $V_{CE} = 80 \text{ Vdc}$	2N5302 2N5303	I_{CBO}	5.0 5.0	μAdc

2N5302, 2N5303 JAN SERIES

ELECTRICAL CHARACTERISTICS

Characteristics		Symbol	Min.	Max.	Unit
ON CHARACTERISTICS					
Forward-Current Transfer Ratio		h_{FE}			
$I_C = 1.0 \text{ Adc}$, $V_{CE} = 2.0 \text{ Vdc}$	All Types		40		
$I_C = 15 \text{ Adc}$, $V_{CE} = 2.0 \text{ Vdc}$	2N5302		15	60	
$I_C = 10 \text{ Adc}$, $V_{CE} = 2.0 \text{ Vdc}$	2N5303		15	60	
$I_C = 30 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$			5.0		
$I_C = 20 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$			5.0		
Base-Emitter Saturation Voltage		$V_{BE(sat)}$			
$I_C = 10 \text{ Adc}$, $I_B = 1.0 \text{ Adc}$	All Types			1.7	Vdc
$I_C = 15 \text{ Adc}$, $I_B = 1.5 \text{ Adc}$	2N5302			1.8	
$I_C = 15 \text{ Adc}$, $I_B = 1.5 \text{ Adc}$	2N5303			2.0	
$I_C = 20 \text{ Adc}$, $I_B = 2.0 \text{ Adc}$	2N5302			2.5	
$I_C = 20 \text{ Adc}$, $I_B = 4.0 \text{ Adc}$	2N5303			2.5	
Base-Emitter Non-Saturation Voltage		V_{BE}			
$V_{CE} = 2.0 \text{ Vdc}$; $I_C = 15 \text{ Adc}$	2N5302			1.8	Vdc
$V_{CE} = 2.0 \text{ Vdc}$; $I_C = 10 \text{ Adc}$	2N5303			1.5	
$V_{CE} = 4.0 \text{ Vdc}$; $I_C = 30 \text{ Adc}$	2N5302			3.0	
$V_{CE} = 4.0 \text{ Vdc}$; $I_C = 20 \text{ Adc}$	2N5303			2.5	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$			
$I_C = 10 \text{ Adc}$, $I_B = 1.0 \text{ Adc}$	2N5302			0.75	Vdc
$I_C = 10 \text{ Adc}$, $I_B = 1.0 \text{ Adc}$	2N5303			1.0	
$I_C = 15 \text{ Adc}$, $I_B = 1.5 \text{ Adc}$	2N5302			1.0	
$I_C = 15 \text{ Adc}$, $I_B = 1.5 \text{ Adc}$	2N5303			1.5	
$I_C = 20 \text{ Adc}$, $I_B = 2.0 \text{ Adc}$	2N5302			2.0	
$I_C = 20 \text{ Adc}$, $I_B = 4.0 \text{ Adc}$	2N5303			2.0	
$I_C = 40 \text{ Adc}$, $I_B = 6.0 \text{ Adc}$	2N5302			3.0	

DYNAMIC CHARACTERISTICS

Magnitude of Small-Signal Short Circuit Forward Current Transfer Ratio I _C = 1.0 Adc, V _{CE} = 10 Vdc, f = 1.0 MHz	h _{fe}	2.0	40	
Output Capacitance V _{CB} = 10 Vdc, I _E = 0, 100 kHz ≤ f ≤ 1.0 MHz	C _{obo}		800	pF

SWITCHING CHARACTERISTICS

Delay Time	$V_{CC} = 30 \text{ Vdc}$; $I_C = 10 \text{ Adc}$; $I_B = 1.0 \text{ Adc}$	t_d		0.2	μs
Rise Time		t_r		0.9	μs
Storage Time		t_s		2.0	μs
Fall Time		t_f		1.0	μs

SAFE OPERATING AREA

DC Tests: T_C = 25⁰C, 1 Cycle, t ≥ 1.0 s		
Test 1		
V _{CE} = 6.67 Vdc, I _C = 30 Adc	2N5302	
V _{CE} = 10 Vdc, I _C = 20 Adc	2N5303	
Test 2		
V _{CE} = 20 Vdc, I _C = 10 Adc	2N5302; 2N5303	
Test 3		
V _{CE} = 40 Vdc, I _C = 3.0Adc	2N5302; 2N5303	
Test 4		
V _{CE} = 50 Vdc, I _C = 600 mAdc	2N5302	
V _{CE} = 60 Vdc, I _C = 600 mAdc	2N5303	
Clamped Switching: T_A = 25⁰C, V_{CE} = 15 Vdc		
Clamp Voltage = 60 Vdc, I _C = 30 Adc	2N5302	
Clamp Voltage = 80 Vdc, I _C = 20 Adc	2N5303	