KEY FEATURES

- JAN/JANTX/JANTXV STANDARD PRODUCTS
- QUALIFIED PER MIL-PRF-19500/371
- LOW ON RESISTANCE
- FAST SWITCHING
- HIGH OFF ISOLATION
- HIGH POWER TRANSISTOR
- SECOND SOURCE FOR MICROSEMI
- DESIGNED FOR USE IN HIGH VOLTAGE INVERTERS, CONVERTERS, SWITCHING REGULATORS AND LINE OPERATED AMPLIFIERS

Part Number	Package	19500/	Emitter/Base Voltage	Collector Current
2N3902	TO-3	371	400V/700V	3.5A

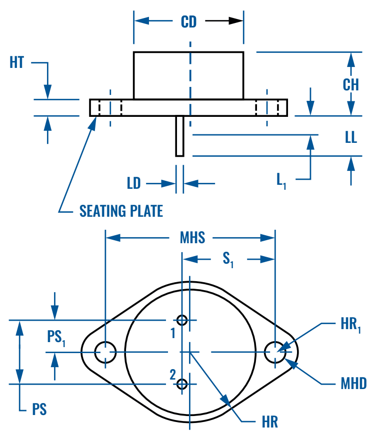
ABSOLUTE MAXIMUM RATINGS

Emitter-Base Voltage	5V	Storage Temperature	-65 to 200°C
Base Current	2A	Operating Temperature	-65 to 200°C
Lead Temperature (1/16 from case, 10 sec)	300°C	Power Dissipation Derating	5W @ 25°C T_A 100W @ 75°C T_C 29mW/°C for T_A > 25°C 800mW/°C for T_C > 75°C

ORDERING GUIDE

JAN2N3902 JANTX2N3902 JANTXV2N3902

TO-3 PACKAGE OUTLINE & PIN CONNECTIONS



Ltr	Dimensions			
	Inches		mm	
	Min.	Max.	Min.	Max.
CD		0.875		22.22
CH	0.250	0.328	6.35	8.33
HR	0.495	0.525	12.57	13.34
HR_1	0.131	0.188	3.33	4.78
HT	0.060	0.135	1.52	3.43
LD	0.038	0.043	0.97	1.09
LL	0.312	0.500	7.92	12.70
L_1		0.050		1.27
MHD	0.151	0.161	3.84	4.09
MHS	1.177	1.197	29.90	30.40
PS	0.420	0.440	10.67	11.18
PS_1	0.205	0.225	5.21	5.72
S_1	0.655	0.675	16.64	17.15

ELECTRICAL SPECIFICATIONS
Typical @ 25°C unless otherwise noted

Parameter	Symbol	Min.	Max.	Unit
Collector-Base Breakdown Voltage I_C = 100mAdc	$V_{(BR)CEO}$	325		Vdc
Collector-Emitter Cutoff Current V_{CE} = 700Vdc, V_{BE} = 1.5Vdc	I_{CEX}		20	µA
Collector-Emitter Cutoff Current V_{CE} = 320Vdc	I_{CEO}		100	µA
Emitter-Base Cutoff Current V_{EB} = 5Vdc	I_{EBO}		200	µA
Forward-Current Transfer Ratio I_C = 0.5Adc, V_{CE} = 5.0Vdc I_C = 1.0Adc, V_{CE} = 5.0Vdc I_C = 2.5Adc, V_{CE} = 5.0Vdc I_C = 3.5Adc, V_{CE} = 5.0Vdc	h_{FE}	25 30 10 5	90	
Thermal Resistance	$R_{\theta JC}$		1.25	c/w
Base-Emitter Saturated Voltage I_B = 0.1Adc, I_C = 1.0Adc I_B = 0.7Adc, I_C = 3.5Adc	$V_{BE(sat)}$		1.5 2.0	Vdc Vdc
Collector-Emitter Saturated Voltage I_B = 0.1Adc, I_C = 1.0Adc I_B = 0.7Adc, I_C = 3.5Adc	$V_{CE(sat)}$		0.8 2.5	Vdc Vdc
Small-Signal Short-Circuit Forward Current Transfer Ratio I_C = 0.2Adc, V_{CE} = 10Vdc, f = 1.0MHz	$\|h_{fe}\|$	2.5	25	
Forward Current Transfer Ratio I_C = 1Adc, V_{CE} = 5Vdc, T = -55°C	h_{fe}	10		
Output Capacitance V_{CB} = 10Vdc, I_E = 0Adc, 100kHz ≤ f ≤ 1.0MHz	C_{obo}		250	pF
Turn-On Time V_{CC} = 125Vdc, I_C = 1.0Adc, I_{B1} = 0.1Adc	t_{on}		0.8	µs
Turn-Off Time V_{CC} = 125Vdc, I_C = 1.0Adc, I_{B1} = 0.1Adc, I_{B2} = 0.5Adc	t_{off}		1.7	µs

SAFE OPERATING AREA

DC Tests (continuous) - T_C = +250°C; t ³ 1.0s (See Figure 3 of MIL-PRF-19500/371)

Test 1 - V_{CE} = 28.6Vdc, I_C = 3.5Adc | **Test 2** - V_{CE} = 70Vdc, I_C = 1.43Adc | **Test 3** - V_{CE} = 325Vdc, I_C = 55mAdc 2N3902

Switching Tests, Load condition C (unclamped inductive load) - T_C = 250°C; duty cycle = 10%; R_S = 0.1W (See Figure 4 of MIL-PRF-19500/371)

Test 1 - tP = approximately 3ms (vary to obtain I_C); R_{BB1} = 20W; V_{BB1} = 10Vdc; R_{BB2} = 3kW; V_{BB2} = 1.5Vdc; V_{CC} = 50Vdc; I_C = 3.5Adc; L = 60mH; R = 3W; R_L = 14W.

Test 2 - tP = approximately 3ms (vary to obtain I_C); R_{BB1} = 100W; V_{BB1} = 10Vdc; R_{BB2} = 3kW; V_{BB2} = 1.5Vdc; I_C = 0.6Adc V_{CC} = 50Vdc; L = 200mH; R = 8W; R_L = 83W.

Switching Tests, Load condition (clamped inductive load) - T_C = +250°C; duty cycle = 10%. (See Figure 5 of MIL-PRF-19500/371)

Test 1 - tP = approximately 30ms (vary to obtain I_C); R_S = 0.1W; R_{BB1} = 20W; V_{BB1} = 10Vdc; R_{BB2} = 100W; V_{BB2} = 1.5Vdc; V_{CC} = 50Vdc; I_C = 3.5Adc; L = 60mH; R = 3W; R_L ³ 0W. (A suitable clamping circuit or diode can be used.) Clamp Voltage = 400 +0, -5 Vdc 2N3902 (Clamped voltage must be reached)

2n3902-ds-revA-0318.indd