

NPN HIGH POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/518

Devices

2N3771

2N3772

Qualified Level

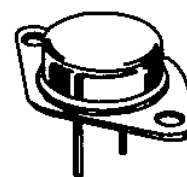
JANTX
JANTXV

MAXIMUM RATINGS

Ratings	Symbol	2N3771	2N3772	Unit
Collector-Emitter Voltage	V _{CEO}	40	60	Vdc
Collector-Base Voltage	V _{CBO}	50	100	Vdc
Emitter-Base Voltage	V _{EBO}	7.0	7.0	Vdc
Base Current	I _B	7.5	5.0	Adc
Collector Current	I _C	30	20	Adc
Total Power Dissipation @ T _A = +25 ⁰ C ⁽¹⁾	P _T	6.0	150	W
@ T _C = +25 ⁰ C ⁽²⁾		150		W
Operating & Storage Junction Temperature Range	T _J , T _{stg}	-65 to +200		⁰ C

1) Derate linearly 34.2 mW/ $^{\circ}\text{C}$ for $T_A > +25^{\circ}\text{C}$

2) Derate linearly 857 mW/ $^{\circ}\text{C}$ for $T_C > +25^{\circ}\text{C}$



TO-3*
(TO-204AA)

*See Appendix A for
Package Outline

ELECTRICAL CHARACTERISTICS ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

Characteristics	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Collector-Base Breakdown Voltage $I_C = 200 \text{ mAdc}$	$V_{(BR)CEO}$	40 60		Vdc
Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}, R_{BE} = 100 \Omega$	$V_{(BR)CER}$	45 70		Vdc
Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}, V_{BE} = -1.5 \text{ Vdc}$	$V_{(BR)CEX}$	50 90		Vdc
Collector-Emitter Cutoff Current $V_{CE} = 30 \text{ Vdc}$ $V_{CE} = 50 \text{ Vdc}$	I_{CEO}		5.0 5.0	mAdc
Emitter-Base Cutoff Current $V_{BE} = 7.0 \text{ Vdc}$	I_{EBO}		2.0	mAdc
Collector-Emitter Cutoff Current $V_{BE} = 1.5 \text{ Vdc}, V_{CE} = 50 \text{ Vdc}$ $V_{BE} = 1.5 \text{ Vdc}, V_{CE} = 100 \text{ Vdc}$	I_{CEX}		500 500	μAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics		Symbol	Min.	Max.	Unit
ON CHARACTERISTICS ⁽³⁾					
Forward-Current Transfer Ratio		h_{FE}			
$I_C = 15 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$	2N3771		15	60	
$I_C = 10 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$	2N3772		15	60	
$I_C = 1.0 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$	Both		40	-	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$			
$I_C = 15 \text{ Adc}$, $I_B = 1.5 \text{ Adc}$	2N3771			1.5	Vdc
$I_C = 30 \text{ Adc}$, $I_B = 6.0 \text{ Adc}$	2N3771			4.0	
$I_C = 10 \text{ Adc}$, $I_B = 1.0 \text{ Adc}$	2N3772			1.2	
$I_C = 20 \text{ Adc}$, $I_B = 4.0 \text{ Adc}$	2N3772			4.0	
Base-Emitter Voltage (non-saturated)		V_{BE}			
$I_C = 15 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$	2N3771			2.3	Vdc
$I_C = 10 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$	2N3772			2.0	

DYNAMIC CHARACTERISTICS

Small-Signal Cutoff Frequency		h_{fe}	40		
$I_C = 1.0 \text{ Adc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward-Current Transfer		$ h_{fe} $	6.0	30	
$I_C = 1.0 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$, $f = 100 \text{ kHz}$					
Output Capacitance		C_{obo}		1200	p^f
$V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$					

SWITCHING CHARACTERISTICS

Turn-On Time		t_{on}			
$V_{CC} = 30 \text{ Vdc}$; $I_C = 15 \text{ Adc}$; $I_{B1} = 1.5 \text{ Adc}$	2N3771			10	μs
$V_{CC} = 30 \text{ Vdc}$; $I_C = 10 \text{ Adc}$; $I_{B1} = 1.0 \text{ Adc}$	2N3772			8.0	
Turn-Off Time		t_{off}			
$V_{CC} = 30 \text{ Vdc}$; $I_C = 15 \text{ Adc}$; $I_{B1} = 1.5 \text{ Adc}$; $I_{B2} = -1.5 \text{ Adc}$	2N3771			12	μs
$V_{CC} = 30 \text{ Vdc}$; $I_C = 10 \text{ Adc}$; $I_{B1} = 1.0 \text{ Adc}$; $I_{B2} = -1.0 \text{ Adc}$	2N3772			10	

SAFE OPERATING AREA**DC Tests**

$T_C = +25^\circ\text{C}$, 1 Cycle, $t = 1.0 \text{ s}$

Test 1 (2N3771 only)

$V_{CE} = 5.0 \text{ Vdc}$, $I_C = 30 \text{ Adc}$

Test 2 (2N3771 only)

$V_{CE} = 40 \text{ Vdc}$, $I_C = 3.75 \text{ Adc}$

Test 3 (2N3772 only)

$V_{CE} = 7.5 \text{ Vdc}$, $I_C = 20 \text{ Adc}$

Test 4 (2N3772 only)

$V_{CE} = 60 \text{ Vdc}$, $I_C = 2.5 \text{ Adc}$

Clamped Inductive

$T_A = +25^\circ\text{C}$; duty cycle $\leq 10\%$; $R_S = 0.1 \Omega$

Test 1 (2N3771 only)

$R_{BB1} = 2.0 \Omega$; $V_{BB1} \leq 14 \text{ Vdc}$; $R_{BB2} = 100 \Omega$; $V_{CC} = 20 \pm 5.0 \text{ Vdc}$; $V_{BB2} = 1.5 \text{ Vdc}$; $I_C = 30 \text{ Adc}$; $R_L \leq 0.67 \Omega$; $L = 5.0 \text{ mH}$

Test 2 (2N3772 only)

$R_{BB1} = 2.0 \Omega$; $V_{BB1} \leq 10 \text{ Vdc}$; $R_{BB2} = 100 \Omega$; $V_{CC} = 40 \pm 5.0 \text{ Vdc}$; $V_{BB2} = 1.5 \text{ Vdc}$; $I_C = 20 \text{ Adc}$; $R_L \leq 2.0 \Omega$; $L = 5.0 \text{ mH}$

(3) Pulse Test: Pulse Width = $300 \mu s$, Duty Cycle $\leq 2.0\%$.