

NPN HIGH POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/518

Devices

2N3771

2N3772

Qualified Level

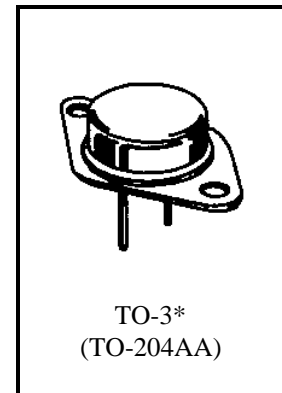
JANTX
JANTXV

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	P_T	@ $T_A = +25^{\circ}\text{C}$ ⁽¹⁾	6.0	W
		@ $T_C = +25^{\circ}\text{C}$ ⁽²⁾	150	W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		$^{\circ}\text{C}$

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 $T_C > +25^{\circ}\text{C}$



*See Appendix A for
Package Outline

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

Characteristics	Symbol	Min.	Max.	Unit
Collector-Base Breakdown Voltage $I_C = 200 \text{ mAdc}$	2N3771	40	60	Vdc
	2N3772			
Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}, R_{BE} = 100 \Omega$	2N3771	45	70	Vdc
	2N3772			
Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}, V_{BE} = -1.5 \text{ Vdc}$	2N3771	50	90	Vdc
	2N3772			
Collector-Emitter Cutoff Current $V_{CE} = 30 \text{ Vdc}$	2N3771		5.0	mAdc
	2N3772			
Emitter-Base Cutoff Current $V_{BE} = 7.0 \text{ Vdc}$	2N3771		2.0	mAdc
	2N3772			
Collector-Emitter Cutoff Current $V_{BE} = 1.5 \text{ Vdc}, V_{CE} = 50 \text{ Vdc}$	2N3771		500	μAdc
	2N3772			
Collector-Emitter Cutoff Current $V_{BE} = 1.5 \text{ Vdc}, V_{CE} = 100 \text{ Vdc}$	2N3771		500	μAdc
	2N3772			

ELECTRICAL CHARACTERISTICS (con't)

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

DYNAMIC CHARACTERISTICS

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

SWITCHING CHARACTERISTICS

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

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 = $300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.