2N3771 (SILICON)
2N3772
MJ3771
MJ3772

HIGH-POWER NPN SILICON TRANSISTORS

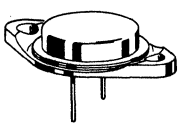
. . . designed for use in power amplifier and switching circuits applications.

- High DC Current Gain –
  h_{FE} = 15 (Min) @ I_C = 15 Adc – 2N3771, MJ3771
  15 (Min) @ I_C = 10 Adc – 2N3772, MJ3772
- Low Collector-Emitter Saturation Voltage –
  $V_{CE(sat)}$ = 1.0 Vdc (Max) @ I_C = 15 Adc – MJ3771
  1.0 Vdc (Max) @ I_C = 10 Adc – MJ3772

20 AND 30 AMPERE POWER TRANSISTORS

NPN SILICON

40-60 VOLTS
150 WATTS



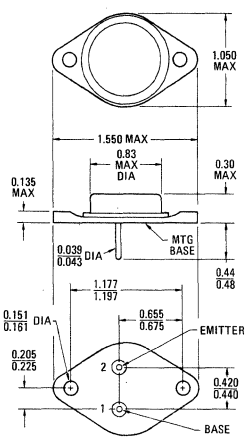
*MAXIMUM RATINGS

Rating	Symbol	2N3771 MJ3771	2N3772 MJ3772	Unit
Collector-Emitter Voltage	V_{CEO}	40	60	Vdc
Collector-Emitter Voltage	V_{CEX}	50	80	Vdc
Collector-Base Voltage	V_{CB}	50	100	Vdc
Emitter-Base Voltage	V_{EB}	5.0	7.0	Vdc
Collector Current – Continuous Peak	I_C	30 30	20 30	Adc
Base Current – Continuous	I_B	7.5	5.0	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	150 0.86		Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		°C

*THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	1.17	°C/W

*Indicates JEDEC Registered Data (2N3771, 2N3772).



CASE 11
TO-3
Collector Connected to Case

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
*Collector-Emitter Sustaining Voltage (Note 1)		$V_{CEO(sus)}$				Vdc
(I_C = 200 mAdc, I_B = 0)	2N3771, MJ3771		40	–	–	
	2N3772, MJ3772		60	–	–	
*Collector Cutoff Current		I_{CEO}				mAdc
(V_{CE} = 30 Vdc, I_B = 0)	2N3771, MJ3771		–	–	10	
(V_{CE} = 50 Vdc, I_B = 0)	2N3772, MJ3772		–	–	10	
*Collector Cutoff Current		I_{CEX}				mAdc
(V_{CE} = Rated V_{CB}, $V_{EB(off)}$ = 1.5 Vdc)	2N3771, MJ3771		–	–	2.0	
	2N3772, MJ3772		–	–	5.0	
(V_{CE} = 30 Vdc, $V_{EB(off)}$ = 1.5 Vdc, T_C = 150°C)	All Types		–	–	10	
Collector Cutoff Current		I_{CBO}				mAdc
*(V_{CB} = Rated V_{CB}, I_E = 0)	2N3771, MJ3771		–	–	2.0	
	2N3772, MJ3772		–	–	5.0	
(V_{CB} = 30 Vdc, I_E = 0, T_C = 150°C)	All Types		–	–	10	
*Emitter Cutoff Current		I_{EBO}				mAdc
(V_{BE} = Rated V_{BE}, I_C = 0)			–	–	5.0	
ON CHARACTERISTICS						
*DC Current Gain (Note 1)		h_{FE}				–
(I_C = 15 Adc, V_{CE} = 4.0 Vdc)	2N3771, MJ3771		15	–	60	
(I_C = 10 Adc, V_{CE} = 4.0 Vdc)	2N3772, MJ3772		15	–	60	
(I_C = 30 Adc, V_{CE} = 4.0 Vdc)	2N3771, MJ3771		5.0	–	–	
(I_C = 20 Adc, V_{CE} = 4.0 Vdc)	2N3772, MJ3772		5.0	–	–	
*Collector-Emitter Saturation Voltage (Note 1)		$V_{CE(sat)}$				Vdc
(I_C = 15 Adc, I_B = 1.5 Adc)	2N3771		–	–	2.0	
	MJ3771		–	–	1.0	
(I_C = 10 Adc, I_B = 1.0 Adc)	2N3772		–	–	1.4	
	MJ3772		–	–	1.0	
(I_C = 30 Adc, I_B = 6.0 Adc)	2N3771, MJ3771		–	–	4.0	
(I_C = 20 Adc, I_B = 4.0 Adc)	2N3772, MJ3772		–	–	4.0	
Base-Emitter Saturation Voltage (Note 1)		$V_{BE(sat)}$				Vdc
(I_C = 10 Adc, I_B = 1.0 Adc)	MJ3771, MJ3772		–	–	1.7	
(I_C = 15 Adc, I_B = 1.5 Adc)	MJ3771, MJ3772		–	–	1.8	
(I_C = 20 Adc, I_B = 2.0 Adc)	MJ3771, MJ3772		–	–	2.5	
*Base-Emitter On Voltage (Note 1)		$V_{BE(on)}$				Vdc
(I_C = 15 Adc, V_{CE} = 4.0 Vdc)	2N3771		–	–	2.7	
	MJ3771		–	–	1.7	
(I_C = 10 Adc, V_{CE} = 4.0 Vdc)	2N3772		–	–	2.2	
	MJ3772		–	–	1.7	
DYNAMIC CHARACTERISTICS						
Current-Gain–Bandwidth Product		f_T				MHz
(I_C = 1.0 Adc, V_{CE} = 4.0 Vdc, f = 50 kHz)	2N3771, 2N3772		0.2	–	–	
(I_C = 1.0 Adc, V_{CE} = 10 Vdc, f = 1.0 MHz)	MJ3771, MJ3772		2.0	–	–	
Small Signal Current Gain (I_C = 10 Adc, V_{CE} = 4.0 Vdc, f = 1.0 kHz)		h_{fe}	40	–	–	–
SWITCHING CHARACTERISTICS						
Rise Time	MJ3771, MJ3772	t_r	–	350	–	ns
Storage Time (V_{CC} = 10 Vdc, I_C = 10 Adc, I_{B1} = I_{B2} = 1.0 Adc)	MJ3771, MJ3772	t_s	–	700	–	ns
Fall Time	MJ3771, MJ3772	t_f	–	300	–	ns

*Indicates JEDEC Registered Data (2N3771, 2N3772).
Note 1: Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

ACTIVE REGION DC SAFE OPERATING AREA

FIGURE 1 – 2N3771, 2N3772

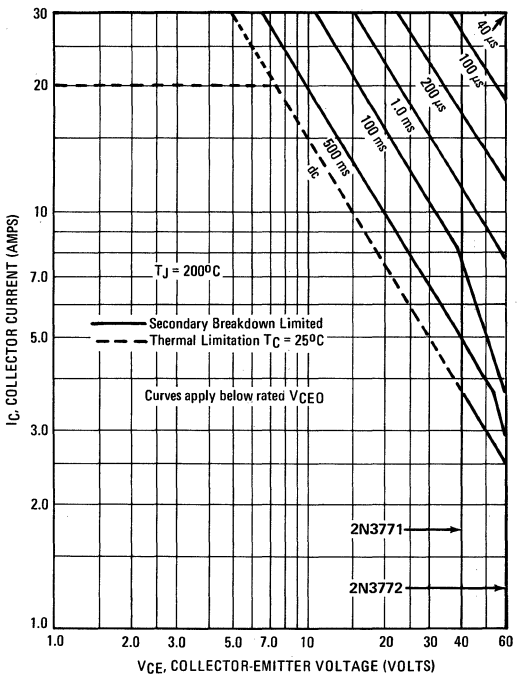
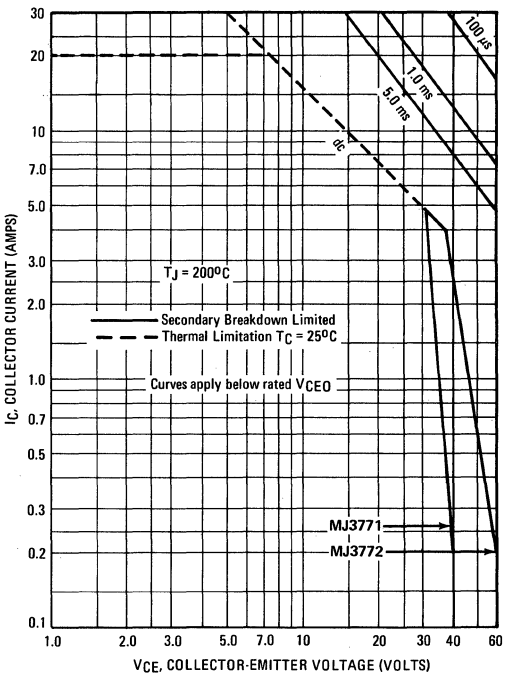


FIGURE 2 – MJ3771, MJ3772



The Safe Operating Area Curves indicate I_C–V_{CE} limits below which the device will not enter secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a catastrophic failure. To insure operation below the maximum T_J, power-temperature derating must be observed for both steady state and pulse power conditions.