

# Silicon Power Transistor 2N3773AR

## Technical Data

**Typical Applications :** These devices are designed for high power audio , disk head positioners and other linear applications. These devices can also be used in power switching circuits such as relay or solenoid drivers , dc to dc converters or inverters.

### Specification Features :

- ☞ **Complementary** NPN Silicon Power Transistor
- ☞ 16 Amp / 140 V device in TO-204AA [ TO-3 ] package
- ☞ 150 Watts device
- ☞ High safe operating area [ 150 W @ 100 V ]
- ☞ Completely characterized for linear operation
- ☞ High DC current gain & low saturation voltage

Symbol	Parameters / Conditions	Ratings
<b>Maximum Ratings :</b>		
$V_{CEO}$	Collector- Emitter Voltage	140 Vdc
$V_{CEX}$	Collector- Emitter Voltage	160 Vdc
$V_{CBO}$	Collector - Base Voltage	160 Vdc
$V_{EBO}$	Emitter Base Voltage	7 Vdc
$I_C$	Collector Current – Continuous	16 Adc
$I_{CM}$	Peak : Pulse width = 5 ms , Duty Cycle 10 %	30 Adc
$I_B$	Base Current – Continuous	4 Adc
$I_{BM}$	Peak : Pulse width = 5 ms , Duty Cycle 10 %	15 Adc



<b>Thermal Characteristics :</b>		
$R_{thjc}$	Thermal resistance junction to case	1.17 °C/W
$P_D$	Total Power Dissipation @ $T_c = 25\text{ °C}$ Derate above 25 °C	150 Watta 0.855 W/°C
$T_j$ & $T_{stg}$	Operating and Storage Junction Temperature Range	-65 °C ....+ 200 °C

### **ELECTRICAL CHARACTERISTICS :**

[  $T_c = 25\text{ °C}$  unless otherwise noted ]

Characteristic	Symbol	Min	Typ	Max	Unit
<b>Off Characteristics : [ Pulse Test : Pulse width = 300 <math>\mu</math>s , Duty Cycle 2 % ]</b>					
Collector – Emitter Breakdown Voltage [ $I_c = 0.2\text{ Adc}$ , $I_B = 0$ ]	$V_{CEO(sus)}$	140			Vdc
Collector – Emitter Sustaining Voltage [ $I_c = 0.1\text{ Adc}$ , $V_{BE(off)} = 1.5\text{ Vdc}$ , $R_{BE} = 100\text{ Ohms}$ ]	$V_{CEX(sus)}$	160			Vdc
Collector – Emitter Sustaining Voltage [ $I_c = 0.2\text{ Adc}$ , $R_{BE} = 100\text{ Ohms}$ ]	$V_{CER(sus)}$	150			Vdc
Collector Cutoff Current [ $V_{CE} = 120\text{ Vdc}$ , $I_B = 0$ ]	$I_{CEO}$			10	Vdc
Collector Cutoff Current [ $V_{CE} = 140\text{ Vdc}$ , $V_{BE(off)} = 1.5\text{ Vdc}$ ] [ $V_{CE} = 140\text{ V}$ , $V_{BE(off)} = 1.5\text{ Vdc}$ , $T_c = 150\text{ °C}$ ]	$I_{CEX}$			2 10	mAdc
Collector Cutoff Current [ $V_{CB} = 140\text{ Vdc}$ , $I_E = 0$ ]	$I_{CBO}$			2	Vdc
Emitter Base Leakage [ $V_{EB} = 7\text{ Vdc}$ , $I_c = 0$ ]	$I_{EBO}$			5	mAdc
<b>On Characteristics : [ Pulse Test : Pulse width = 300 <math>\mu</math>s , Duty Cycle 2 % ]</b>					
DC Current Gain [ $I_c = 4\text{ Adc}$ , $V_{CE} = 4\text{ Vdc}$ ]	$h_{FE}$	80		110	

Collector-Emitter Saturation Voltage [ $I_C = 8 \text{ A}_{dc}$ , $I_B = 800 \text{ mA}_{dc}$ ] [ $I_C = 16 \text{ A}_{dc}$ , $I_B = 3.2 \text{ A}_{dc}$ ]	$V_{CE(sat)}$				1.4 4	Vdc
Base-Emitter Saturation Voltage [ $I_C = 8 \text{ A}_{dc}$ , $I_B = 4 \text{ A}_{dc}$ ]	$V_{BE(on)}$				2.2	Vdc

<b>Dynamic Characteristics :</b>						
Magnitude of Common Emitter small signal , short circuit , forward current transfer ratio [ $I_C = 1 \text{ A}_{dc}$ , $f=50 \text{ KHz}$ ]	$ h_{fe} $	4				
Small signal current gain [ $I_C = 1 \text{ A}_{dc}$ , $V_{CE} = 100 \text{ V}_{dc}$ , $f = 1 \text{ KHz}$ ]	$h_{fe}$	40				
<b>Second Breakdown Characteristics :</b>						
Second Breakdown Collector Current with Base Forward Biased $t = 1 \text{ s}$ [non-repetitive] , $V_{CE} = 100 \text{ V}_{dc}$	$I_{S/b}$	1.5				A <sub>dc</sub>