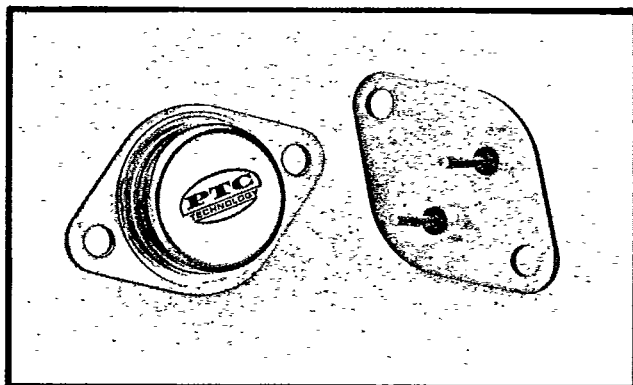




**Power Technology Components**

**POWERMODE III SERIES**



**HIGH VOLTAGE**  
**NPN TRANSISTORS**  
**40 AMPERES**  
**350 VOLTS**

**FEATURES**

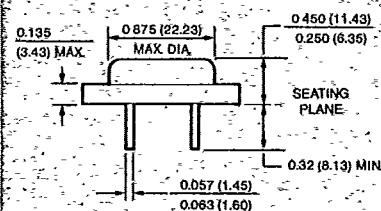
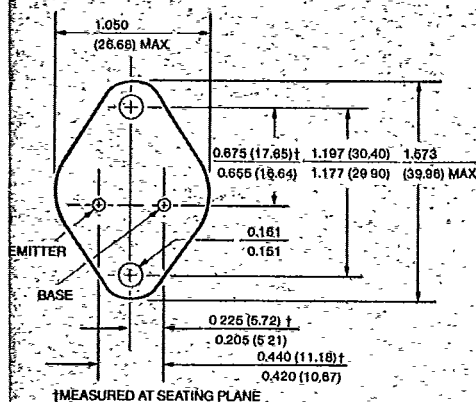
- High Voltage Rating:  $V_{CEX} = 350$  Volts
- High Current Rating 40 Amperes
- Superior Resistance to Thermal Fatigue
- Industrial and Military Applications

**APPLICATIONS**

- Switching Regulators
- PWM Inverters
- Deflection Circuits
- Motor Controls
- Solenoid Drivers

**SPECIFICATIONS**  
**General**

The PTC 6682 and PTC 6683 series transistors are high-voltage, high-gain, NPN, 40 ampere switching transistors for Industrial and Military Service. The series is particularly well suited to off-line (transformerless) switching power supplies operating as high as 40 KHz. Other applications include PWM Inverters, Motor Controls, Relay and Solenoid Drivers, Deflection Circuits and Pulse Modulators.



Basic dimensions in inches.

Dimensions shown in PARENTHESES are in millimeters.

**Package Outline**  
**JEDEC TO-204AE**  
**(Formerly JEDEC TO-3)**

**Power Technology Components**

A Microsemi Company

23201 South Normandie Avenue

Torrance, California 90501

(213) 534-3737 TLX 664276 FAX 213-530-5609

## SERIES PTC 6682/6683 High Voltage Fast Switching NPN Transistors

### Absolute maximum ratings

Description	PTC 6682	PTC 6683	Unit	Conditions
V <sub>CEV</sub> Collector-Emitter Voltage	450	550	Volts	
V <sub>CEO</sub> Collector-Emitter Voltage	300	350	Volts	
V <sub>CEx</sub> Collector-Emitter Voltage	350	400	Volts	
I <sub>C</sub> Collector Current Continuous	40		A	
I <sub>C</sub> Collector Current Peak	50		A	
I <sub>B</sub> Base Current Continuous	12		A	
I <sub>B</sub> Base Current Peak	15		A	
P <sub>D</sub> Maximum Power Dissipation	230		W	T <sub>c</sub> = 25°C
I <sub>E</sub> Emitter Current Continuous	40		A	
I <sub>E</sub> Emitter Current Peak	50		A	

### Electrical characteristics at 25°C (unless otherwise specified)

Description	PTC 6682		PTC 6683		Unit	Conditions
	Min.	Max.	Min.	Max.		
V <sub>CE(sus)</sub> Collector-Emitter Sustaining Voltage	300		350		V	I <sub>C</sub> = 100mA L = 35 mH
V <sub>CEx(sus)</sub> Collector-Emitter Sustaining Voltage	350		400		V	I <sub>C</sub> = 40A, I <sub>B1</sub> = 2A, T <sub>c</sub> = +100°C V <sub>BE(off)</sub> = -6V
I <sub>CEV</sub> Collector Cutoff Current		0.1		0.1	mA	V <sub>CE</sub> = Rated V <sub>CEV</sub> V <sub>BE(off)</sub> = -1.5V
		1.0		1.0	mA	V <sub>CE</sub> = Rated V <sub>CEV</sub> V <sub>BE(off)</sub> = -1.5V, T <sub>c</sub> = +100°C
I <sub>EBO</sub> Emitter Cutoff Current		2		2	mA	V <sub>BE</sub> = -8V
V <sub>CE(sat)</sub> Collector-Emitter Saturation Voltage <b>1</b>		1.5		1.5	V	I <sub>C</sub> = 40A, I <sub>B</sub> = 8A
		2		2	V	I <sub>C</sub> = 40A, I <sub>B</sub> = 8A T <sub>c</sub> = +100°C
V <sub>BE(sat)</sub> Base-Emitter Saturation Voltage <b>1</b>		2.0		2.0	V	I <sub>C</sub> = 40A, I <sub>B</sub> = 8A
h <sub>FE</sub> DC Current Gain <b>1</b>	8	20	8	20		I <sub>C</sub> = 40A, V <sub>CE</sub> = 3V
C <sub>OB</sub> Output Capacitance	150	500	150	500	pF	V <sub>CB</sub> = 10V, f = 0.1MHz
I <sub>S/b</sub> Second Breakdown Collector Current	15.5		15.5		A	V <sub>CE</sub> = 15V Non Rep tp = 1sec

### Switching characteristics (Resistive Load)

Description	Min.	Max.	Min.	Max.	Unit	Conditions
t <sub>d</sub> Delay Time		0.1		0.1	μs	V <sub>CC</sub> = 200V, I <sub>C</sub> = 40A
t <sub>r</sub> Rise Time		0.6		0.6	μs	I <sub>B1</sub> = 4A, I <sub>B2</sub> = 8A, t <sub>p</sub> = 25 μs
t <sub>s</sub> Storage Time		2.5		2.5	μs	V <sub>BE(off)</sub> = -6V
t <sub>f</sub> Fall Time		0.5		0.5	μs	Duty cycle ≤ 2%

### Thermal and mechanical characteristics

Description	Type	Min.	Type	Max.	Unit	Conditions
R <sub>θJC</sub> Thermal Resistance Junction to Case	All			.75	°C/W	
Maximum Lead Temp. for Soldering Purposes: 1/8" from Case for 5 Sec.				275	°C	
T <sub>J</sub> , T <sub>STG</sub> Operating & Storage Junction Temperature Range		-65		200°	°C	

**1** PULSE TEST: PW = 300 μs, DUTY CYCLE ≤ 2%