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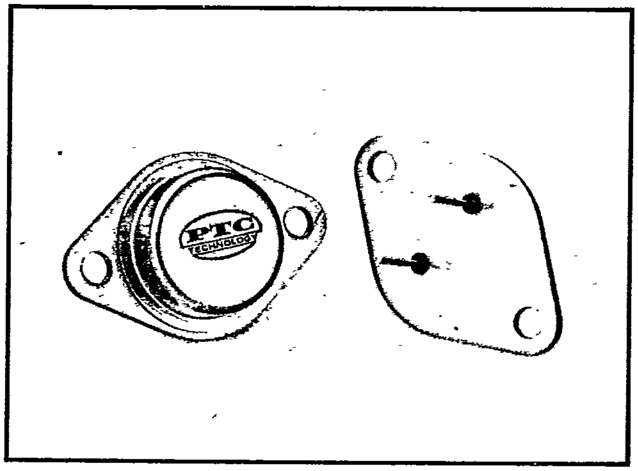
PTC 10004
PTC 10005

PTC TECHNOLOGY

Power Technology Components

HIGH VOLTAGE DARLINGTON NPN TRANSISTORS 20 AMPERES 400 VOLTS



FEATURES

- High Voltage Rating – 400 Volts Sustaining
- Glass Passivated Die to Provide Excellent High Temperature Stability

APPLICATIONS

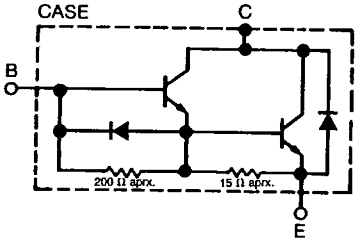
- High Voltage Switching Power Supplies
- Inverters/Regulators
- Deflection Circuits
- Control Circuitry

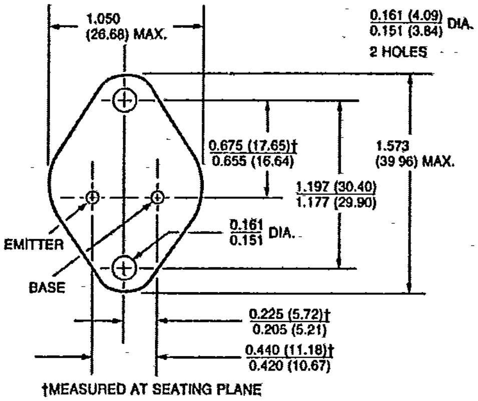
SPECIFICATIONS

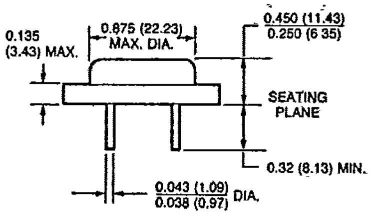
General

The PTC 10004 and PTC 10005 Powermode series of silicon NPN darlington transistors are designed for high voltage, high speed, high power switching applications. These high voltage darlington transistors are ideally suited for applications in switching power supplies, regulators and inverter or converter circuits operating off 240 volt lines.

Electrical







Basic dimensions in inches.

Dimensions shown in PARENTHESES are in millimeters.

Package Outline
JEDEC TO-204AA

Power Technology Components

A Microsemi Company
23201 South Normandie Avenue
Torrance, California 90501
(213) 534-3737 TLX 664276 FAX 213-530-5609

T-33-29

SERIES PTC 10004/10005

High Voltage Fast Switching NPN Darlingtons

Absolute maximum ratings

	Description	PTC 10004	PTC 10005	Unit	Conditions
V_{CBO}	Collector-Base Voltage	450	500	Volts	
$V_{CEO(sus)}$	Collector-Emitter Voltage	350	400	Volts	
$V_{CEX(sus)}$	Collector-Emitter Voltage	400	450	Volts	
I_C	Collector Current Continuous	20		A	
I_C	Collector Current Peak	30		A	
I_B	Base Current Continuous	2.5		A	
I_B	Base Current Peak	5.0		A	
P_D	Maximum Power Dissipation	175		W	$T_C = 25°C$
I_E	Emitter Current Continuous	20		A	
I_E	Emitter Current Peak	30		A	

Thermal and mechanical characteristics

	Description	Type	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction to Case	All			1.0	°C/W
	Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds				275	°C
t_J, t_{STG}	Operating and Storage Junction Temperature Range		−65		200	°C

Electrical characteristics at 25°C (unless otherwise specified)

		Description	PTC 10004		PTC 10005		Unit	Conditions
			Min.	Max.	Min.	Max.		
$V_{CEO(sus)}$		Collector-Emitter Sustaining Voltage	350		400		V	$I_C = 100mA$, $L = 2mH$ Unclamped
$V_{CEX(sus)}$		Collector-Emitter Sustaining Voltage	400		450		V	$I_C = 2A$ $V_{BE(off)} = 5V$
I_{CEV}		Collector Cutoff Current	0.25		0.25		mA	V_{CE} = Rated V_{CBO} $V_{BE(off)} = -1.5V$
			5		5		mA	V_{CE} = Rated V_{CBO} $V_{BE(off)} = -1.5V$, $T_C = +100°C$
I_{EBO}		Emitter Cutoff Current		175		175	mA	$V_{EB} = 2V$
$V_{CE(sat)}$	•	Collector-Emitter Saturation Voltage		1.9		1.9	V	$I_C = 10A$, $I_B = 400mA$
				2.0		2.0	V	$I_C = 10A$, $I_B = 400mA$, $T_C = +100°C$
				3.0		3.0	V	$I_C = 20A$, $I_B = 1A$
$V_{BE(sat)}$	•	Base-Emitter Saturation Voltage		2.5		2.5	V	$I_C = 10A$, $I_B = 400mA$
h_{FE}	•	DC Current Gain	50	600	50	600		$I_C = 5A$, $V_{CE} = 5V$
			40	400	40	400		$I_C = 10A$, $V_{CE} = 5V$
V_F	•	Diode Forward Voltage		5		5	V	$I_F = 10A$
$I_{s/b}$		Second Breakdown Collector Current	17.5		17.5		A	$V_{CE} = 10V$ Non Rep. $t_p = 1s$

Switching characteristics

	Description – Resistive Load	Min.	Max.	Min.	Max.	Unit	Conditions
t_d	Delay Time		0.2		0.2	µs	$V_{CC} = 250V$, $I_C = 10A$ $I_{B1} = 0.4A$, $I_{B2} = 1.6A$, $t_p = 50\mu s$ $V_{BE(off)} = -6V$
t_r	Rise Time		0.6		0.6	µs	
t_s	Storage Time		1.5		1.5	µs	
t_f	Fall Time		0.5		0.5	µs	
	Description – Inductive Load, Clamped	Min.	Max.	Min.	Max.	Unit	Conditions
t_{sv}	Storage Time		3.0		3.0		$V_{clamp} = V_{CEX}$, $I_C = 10A$ $I_{B1} = 0.4A$, $I_{B2} = -1.6A$ $V_{BE(off)} = -6V$, $L = 200\mu H$
t_c	Crossover Time		0.5		0.5		
t_{sv}	Storage Time		4.0		4.0	µs	$V_{clamp} = 250V$, $T_C = +100°C$ $I_{B1} = 0.4A$, $I_{B2} = 1.6A$, $I_C = 10A$ $V_{BE(off)} = -6V$, $L = 200\mu H$
t_c	Crossover Time		1.5		1.5	µs	

*Pulse Test: PW = 300µs, Duty Cycle ≤ 2%