



# Series PTC 10000, PTC 10001 NPN Silicon Power Darlington Transistors

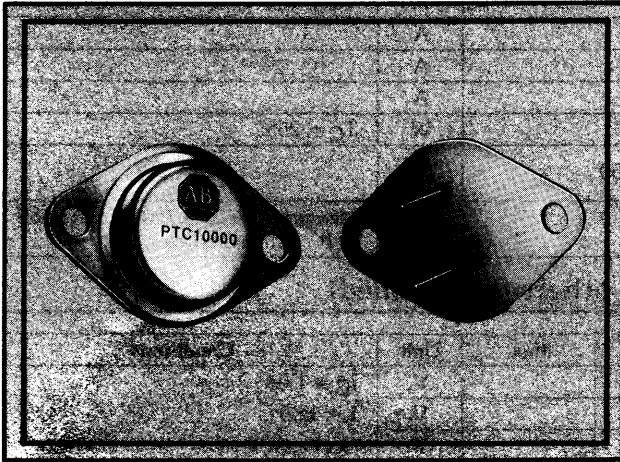
20 Amperes • 400 Volts

## 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

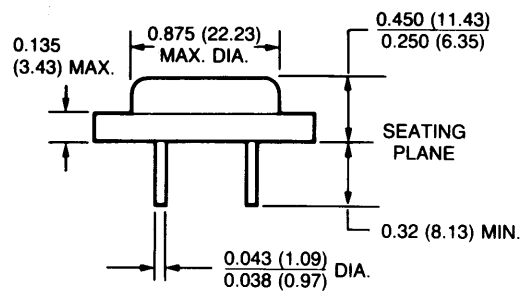
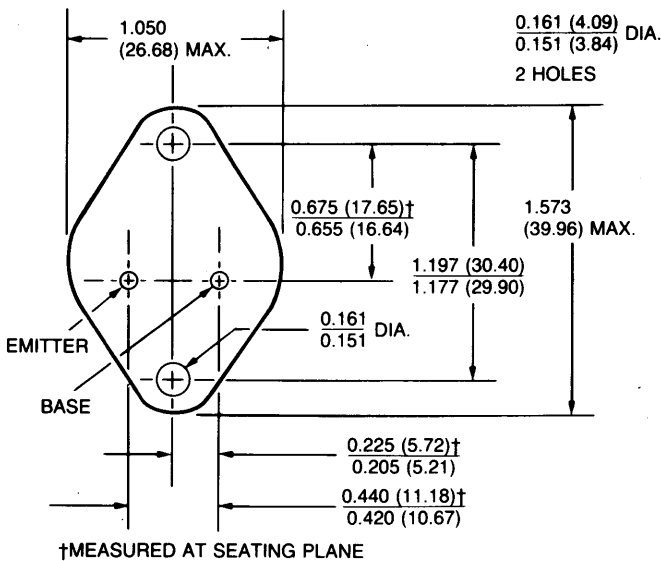
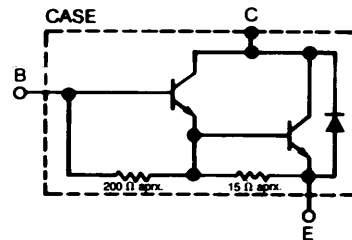


## SPECIFICATIONS

### General

The PTC 10000 and PTC 10001 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-204MA

AVAILABLE IN STANDARD VALUES FROM STOCK AT ELECTRONIC DISTRIBUTORS.

# SERIES PTC 10000/10001

High Voltage Fast Switching NPN Darlington

## Absolute maximum ratings

Description	PTC 10000	PTC 10001	Unit	Conditions
VCBO Collector-Base Voltage	450	500	Volts	
VCEO(sus) Collector-Emitter Voltage	350	400	Volts	
VCEX(sus) Collector-Emitter Voltage	400	450	Volts	
IC Collector Current Continuous	20		A	
IC Collector Current Peak	30		A	
IB Base Current Continuous	2.5		A	
IB Base Current Peak	5.0		A	
PD Maximum Power Dissipation	175		W	TC = 25°C
IE Emitter Current Continuous	20		A	
IE Emitter Current Peak	30		A	

## Thermal and mechanical characteristics

Description	Type	Min.	Typ.	Max.	Unit
RθJC Thermal Resistance Junction to Case	All			1.0	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds					
tJ, tSTG Operating and Storage Junction Temperature Range		-65		200	°C

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

Description	PTC 10000		PTC 10001		Unit	Conditions
	Min.	Max.	Min.	Max.		
VCEO(sus) Collector-Emitter Sustaining Voltage	350		400		V	IC = 2A, L = 2mH Unclamped
VCEX(sus) Collector-Emitter Sustaining Voltage	400		450		V	IC = 2A VBE(off) = 5V
ICEV Collector Cutoff Current	0.25		0.25		mA	VCE = Rated VCBO VBE(off) = -1.5V
	5		5		mA	VCE = Rated VCBO VBE(off) = -1.5V, TC = +100°C
IEBO Emitter Cutoff Current		150		150	mA	VEB = 8V
VCE(sat) Collector-Emitter Saturation Voltage		1.9		1.9	V	IC = 10A, IB = 400mA
		2.0		2.0	V	IC = 10A, IB = 400mA, TC = +100°C
		3.0		3.0	V	IC = 20A, IB = 1A
VBE(sat) Base-Emitter Saturation Voltage		2.5		2.5	V	IC = 10A, IB = 400mA
hFE DC Current Gain	50	600	50	600		IC = 5A, VCE = 5
	40	400	40	400		IC = 10A, VCE = 5
VF Diode Forward Voltage		5		5	V	IF = 10A
Is/b Second Breakdown Collector Current	10		10		A	VCE = 17.5V, Non Rep. tp = 1s

## Switching characteristics

Description - Resistive Load	Min.	Max.	Min.	Max.	Unit	Conditions
td Delay Time		0.2		0.2	μs	VCC = 250V, IC = 10A IB1 = 0.4A, IB2 = 1.6A, tp = 20μs VBE(off) = -6V
tr Rise Time		0.6		0.6	μs	
ts Storage Time		3.5		3.5	μs	
tf Fall Time		2.4		2.4	μs	
Description - Inductive Load, Clamped	Min.	Max.	Min.	Max.	Unit	Conditions
tsv Storage Time		3.75		3.75		Vclamp = 250V, IC = 10A IB1 = 0.4A, IB2 = -1.6A
tc Crossover Time		1.75		1.75		VBE(off) = -6V, L = 200μH
tsv Storage Time		6.5		6.5		Vclamp = 250V, TC = +100°C IB1 = 0.4A, IB2 = 1.6A, IC = 10A
tc Crossover Time		3.0		3.0		VBE(off) = -6V, L = 200μH



# Series PTC 10002, PTC 10003

## NPN Silicon Power Darlington Transistors

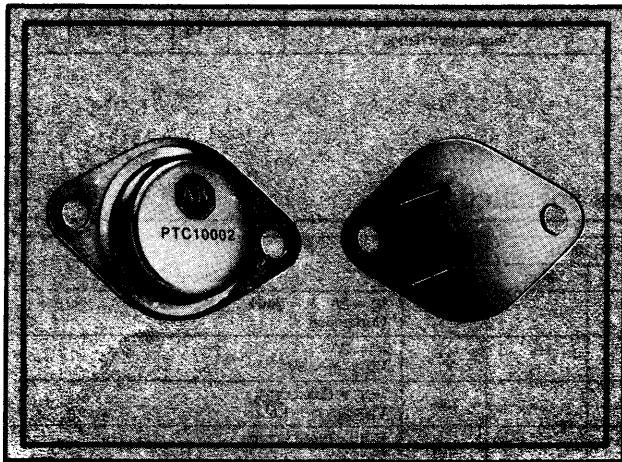
10 Amperes • 400 Volts

### 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

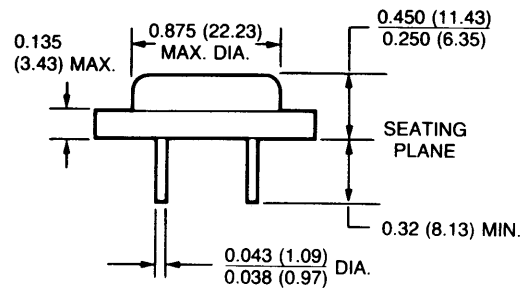
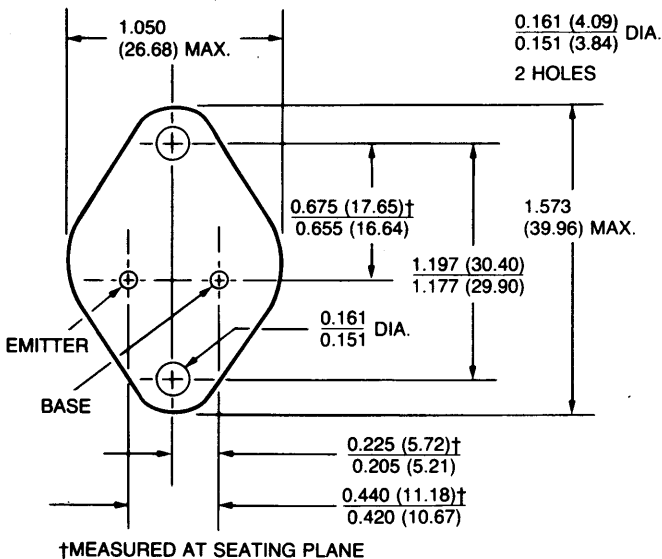
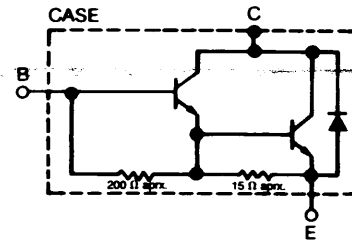


## SPECIFICATIONS

### General

The PTC 10002 and PTC 10003 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-204MA

AVAILABLE IN STANDARD VALUES FROM STOCK AT ELECTRONIC DISTRIBUTORS.

# SERIES PTC 10002/10003

## High Voltage Fast Switching NPN Darlington

### Absolute maximum ratings

Description	PTC 10002	PTC 10003	Unit	Conditions
VCBO Collector-Base Voltage	450	500	Volts	
VCE0(sus) Collector-Emitter Voltage	350	400	Volts	
VCEX(sus) Collector-Emitter Voltage	400	450	Volts	
IC Collector Current Continuous		10	A	
IC Collector Current Peak		20	A	
IB Base Current Continuous		2.5	A	
IB Base Current Peak		5.0	A	
PD Maximum Power Dissipation		150	W	TC = 25°C
IE Emitter Current Continuous		10	A	
IE Emitter Current Peak		20	A	

### Thermal and mechanical characteristics

Description	Type	Min.	Typ.	Max.	Unit
RθJC Thermal Resistance Junction to Case	All			1.17	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds					
θj, ISTG Operating and Storage Junction Temperature Range		-65		200	°C

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

Description	PTC 10002		PTC 10003		Unit	Conditions
	Min.	Max.	Min.	Max.		
VCE0(sus) Collector-Emitter Sustaining Voltage	350		400		V	IC = 2A, L = 2mH Unclamped
VCEX(sus) Collector-Emitter Sustaining Voltage	400		450		V	IC = 2A VBE(off) = -5.0V
ICEV Collector Cutoff Current	0.25		0.25		mA	VCE = Rated VCBO VBE(off) = -1.5V
	5		5		mA	VCE = Rated VCBO VBE(off) = -1.5V, TC = +100°C
IEBO Emitter Cutoff Current	175		175		mA	VEB = 8V
VCE(sat) Collector-Emitter Saturation Voltage		1.9		1.9	V	IC = 5, IB = 250 mA
		2.0		2.0	V	IC = 5A, IB = 250 mA, TC = +100°C
		2.9		2.9	V	IC = 10A, IB = 1.0A
VBE(sat) Base-Emitter Saturation Voltage		2.5		2.5	V	IC = 5A, IB = 250 mA
		40		500		IC = 2.5A, VCE = 5V
hFE DC Current Gain		30		300		IC = 5.0A, VCE = 5V
		5		5	V	IF = 5A
IS/b Second Breakdown Collector Current	10		10			VCE = 15V, Non Rep. tp = 1s

### Switching characteristics

Description – Resistive Load	Min.	Max.	Min.	Max.	Unit	Conditions
td Delay Time		0.2		0.2	μs	VCC = 250, IC = 5A IB1 = 0.25A, IB2 = 1A, tp = 20μs VBE(off) = -6V
tr Rise Time		0.6		0.6	μs	
ts Storage Time		3.0		3.0	μs	
tf Fall Time		1.5		1.5	μs	
Description – Inductive Load, Clamped	Min.	Max.	Min.	Max.	Unit	Conditions
tsv Storage Time		3.0		3.0		Vclamp = 250V, IC = 5A IB1 = 0.25A, IB2 = -1A VBE(off) = -6V, L = 200μH
tc Crossover Time		0.9		0.9		Vclamp = 250V, TC = +100°C IB1 = 0.25A, IB2 = 1A, IC = 5A VBE(off) = -6V, L = 200μH
tsv Storage Time		6.0		6.0		
tc Crossover Time		2.5		2.5		



# Series PTC 10004, PTC 10005 NPN Silicon Power Darlington Transistors

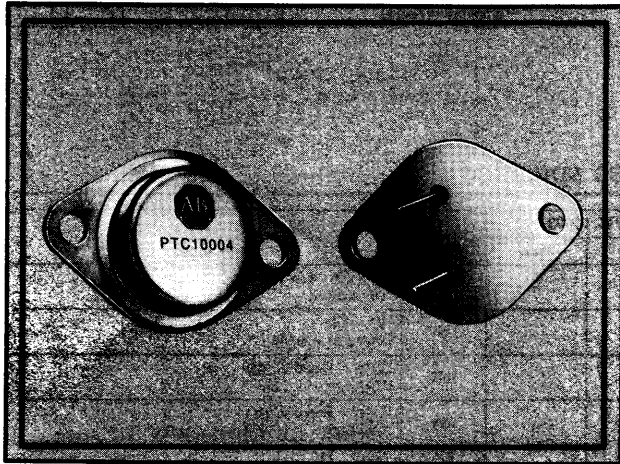
20 Amperes • 400 Volts

## 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

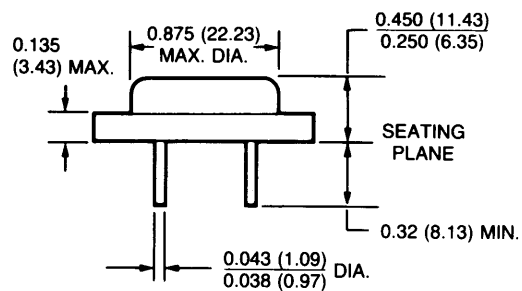
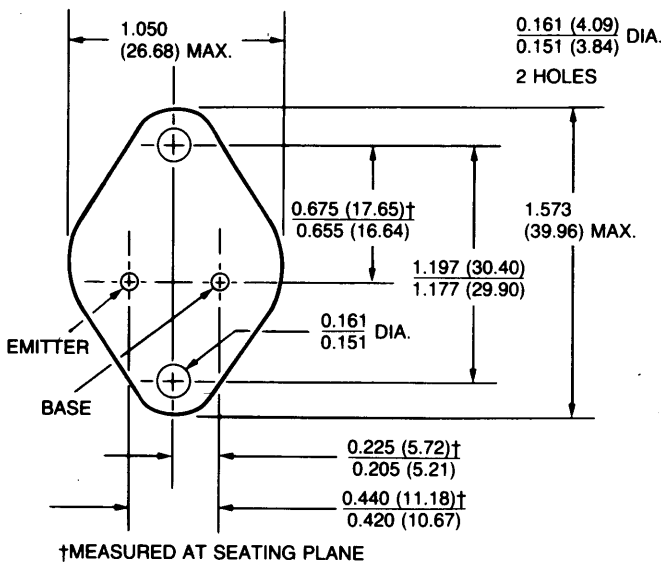
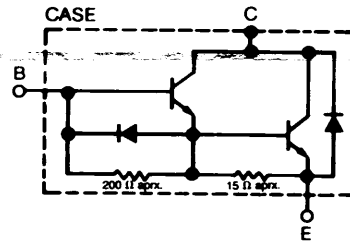


## SPECIFICATIONS

### 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-204MA

AVAILABLE IN STANDARD VALUES FROM STOCK AT ELECTRONIC DISTRIBUTORS.

# SERIES PTC 10004/10005

## High Voltage Fast Switching NPN Darlington

### Absolute maximum ratings

Description	PTC 10004	PTC 10005	Unit	Conditions
V <sub>CB0</sub> Collector-Base Voltage	450	500	Volts	
V <sub>CEO(sus)</sub> Collector-Emitter Voltage	350	400	Volts	
V <sub>CEX(sus)</sub> Collector-Emitter Voltage	400	450	Volts	
I <sub>C</sub> Collector Current Continuous	20		A	
I <sub>C</sub> Collector Current Peak	30		A	
I <sub>B</sub> Base Current Continuous	2.5		A	
I <sub>B</sub> Base Current Peak	5.0		A	
P <sub>D</sub> Maximum Power Dissipation	175		W	T <sub>C</sub> = 25°C
I <sub>E</sub> Emitter Current Continuous	20		A	
I <sub>E</sub> Emitter Current Peak	30		A	

### Thermal and mechanical characteristics

Description	Type	Min.	Typ.	Max.	Unit
R <sub>θJC</sub> 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 <sub>J</sub> , t <sub>STG</sub> 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 <sub>CEO(sus)</sub> Collector-Emitter Sustaining Voltage	350		400		V	I <sub>C</sub> = 2A, L = 2mH Unclamped
V <sub>CEX(sus)</sub> Collector-Emitter Sustaining Voltage	400		450		V	I <sub>C</sub> = 2A V <sub>BE(off)</sub> = 5V
I <sub>CEV</sub> Collector Cutoff Current	0.25		0.25		mA	V <sub>CE</sub> = Rated V <sub>CB0</sub> V <sub>BE(off)</sub> = -1.5V
	5		5		mA	V <sub>CE</sub> = Rated V <sub>CB0</sub> V <sub>BE(off)</sub> = -1.5V, T <sub>C</sub> = +100°C
I <sub>EBO</sub> Emitter Cutoff Current		175		175	mA	V <sub>EB</sub> = 2V
V <sub>CE(sat)</sub> Collector-Emitter Saturation Voltage		1.9		1.9	V	I <sub>C</sub> = 10A, I <sub>B</sub> = 400mA
		2.0		2.0	V	I <sub>C</sub> = 10A, I <sub>B</sub> = 400mA, T <sub>C</sub> = +100°C
		3.0		3.0	V	I <sub>C</sub> = 20A, I <sub>B</sub> = 1A
V <sub>BE(sat)</sub> Base-Emitter Saturation Voltage		2.5		2.5	V	I <sub>C</sub> = 10A, I <sub>B</sub> = 400mA
h <sub>FE</sub> DC Current Gain	50	600	50	600		I <sub>C</sub> = 5A, V <sub>CE</sub> = 5V
	40	400	40	400		I <sub>C</sub> = 10A, V <sub>CE</sub> = 5V
V <sub>F</sub> Diode Forward Voltage		5		5	V	I <sub>F</sub> = 10A
I <sub>S/b</sub> Second Breakdown Collector Current	10		10		A	V <sub>CE</sub> = 17.5V, Non Rep. tp = 1s

### Switching characteristics

Description - Resistive Load	Min.	Max.	Min.	Max.	Unit	Conditions
t <sub>d</sub> Delay Time		0.2		0.2	μs	V <sub>CC</sub> = 250V, I <sub>C</sub> = 10A I <sub>B1</sub> = 0.4A, I <sub>B2</sub> = 1.6A, t <sub>p</sub> = 20μs V <sub>BE(off)</sub> = -6V
t <sub>r</sub> Rise Time		0.6		0.6	μs	
t <sub>s</sub> Storage Time		1.5		1.5	μs	
t <sub>f</sub> Fall Time		0.5		0.5	μs	
Description - Inductive Load, Clamped	Min.	Max.	Min.	Max.	Unit	Conditions
t <sub>sv</sub> Storage Time		3.0		3.0		V <sub>clamp</sub> = V <sub>CEX</sub> , I <sub>C</sub> = 10A I <sub>B1</sub> = 0.4A, I <sub>B2</sub> = -1.6A
t <sub>c</sub> Crossover Time		0.5		0.5		V <sub>BE(off)</sub> = -6V, L = 200μH
t <sub>sv</sub> Storage Time		4.0		4.0	μs	V <sub>clamp</sub> = 250V, T <sub>C</sub> = +100°C I <sub>B1</sub> = 0.4A, I <sub>B2</sub> = 1.6A, I <sub>C</sub> = 10A
t <sub>c</sub> Crossover Time		1.5		1.5	μs	V <sub>BE(off)</sub> = -6V, L = 200μH



# Series PTC 10006, PTC 10007

## NPN Silicon Power Darlington Transistors

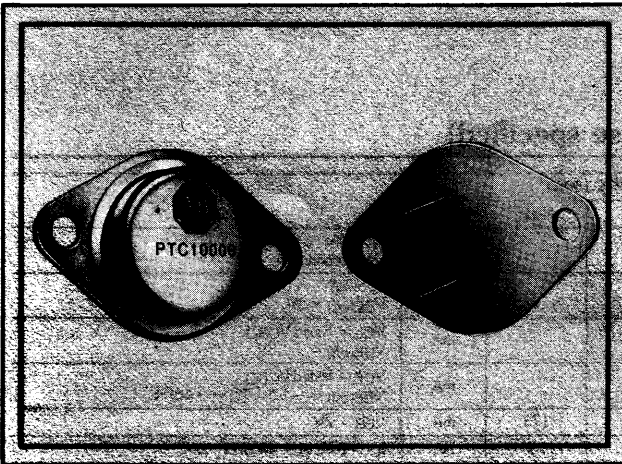
10 Amperes • 400 Volts

### 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

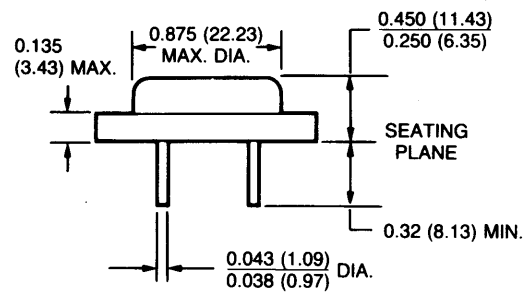
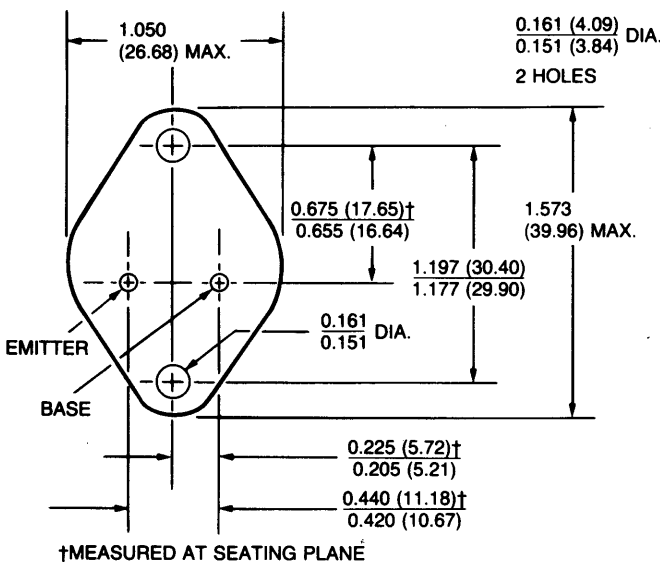
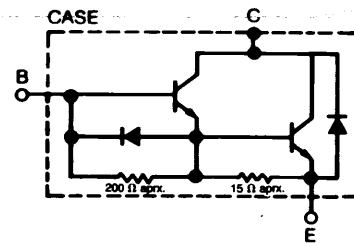


## SPECIFICATIONS

### General

The PTC 10006 and PTC 10007 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-204MA

AVAILABLE IN STANDARD VALUES FROM STOCK AT ELECTRONIC DISTRIBUTORS.

# SERIES PTC 10006/10007

## High Voltage Fast Switching NPN Darlington

### Absolute maximum ratings

Description	PTC 10006	PTC 10007	Unit	Conditions
VCBO Collector-Base Voltage	450	500	Volts	
VCEO(sus) Collector-Emitter Voltage	350	400	Volts	
VCEX(sus) Collector-Emitter Voltage	400	450	Volts	
IC Collector Current Continuous	10		A	
IC Collector Current Peak	20		A	
IB Base Current Continuous	2.5		A	
IB Base Current Peak	5.0		A	
PD Maximum Power Dissipation	150		W	TC = 25°C
IE Emitter Current Continuous	10		A	
IE Emitter Current Peak	20		A	

### Thermal and mechanical characteristics

Description	Type	Min.	Typ.	Max.	Unit
R <sub>θJC</sub> Thermal Resistance Junction to Case	All			1.17	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds					
				275	°C
T <sub>J</sub> , ISTG Operating and Storage Junction Temperature Range		-65		200	°C

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

Description	PTC 10006		PTC 10007		Unit	Conditions
	Min.	Max.	Min.	Max.		
VCEO(sus) Collector-Emitter Sustaining Voltage	350		400		V	IC = 2A, L = 2mH Unclamped
VCEX(sus) Collector-Emitter Sustaining Voltage	400		450		V	IC = 1A, VCEX Clamped VBE(off) = -6V
ICEV Collector Cutoff Current		.25		.25	mA	VCE = Rated VCBO VBE(off) = -1.5V
		5		5	mA	VCE = Rated VCBO VBE(off) = -1.5V, TC = +100°C
IEBO Emitter Cutoff Current		175		175	mA	VEB = 2V
VCE(sat) Collector-Emitter Saturation Voltage		1.9		1.9	V	IC = 5A, IB = 250mA
		2.0		2.0	V	IC = 5A, IB = 250mA, TC = +100°C
		2.9		2.9	V	IC = 10A, IB = 1A
VBE(sat) Base-Emitter Saturation Voltage		2.5		2.5	V	IC = 5A, IB = 250mA
hFE DC Current Gain	40	500	40	500		IC = 2.5A, VCE = 5V
	30	300	30	300		IC = 5A, VCE = 5V
VF Diode Forward Voltage		5		5	V	IF = 5A
Is/b Second Breakdown Collector Current	10		10		A	VCE = 15V, Non Rep. tp = 1s

### Switching characteristics

Description - Resistive Load		Min.	Max.	Min.	Max.	Unit	Conditions
td	Delay Time		.2		.2	μs	VCC = 250V, IC = 5A IB1 = .250A, IB2 = 1A, tp = 20μs VBE(off) = -6V
tr	Rise Time		.6		.6	μs	
ts	Storage Time		1.5		1.5	μs	
tf	Fall Time		.5		.5	μs	
Description - Inductive Load, Clamped		Min.	Max.	Min.	Max.	Unit	Conditions
tsv	Storage Time		3.0		3.0	μs	Vclamp = VCEX, IC = 5.0A IB1 = .250A, IB2 = 1A
tc	Crossover Time		.4		.4	μs	VBE(off) = -6V, L = 100μH
tsv	Storage Time		4.0		4.0	μs	Vclamp = VCEX, TC = +100°C IB1 = .250A, IB2 = 1A, IC = 5A
tc	Crossover Time		1.5		1.5	μs	VBE(off) = -6V, L = 100μH





# Series PTC 10008, PTC 10009

## NPN Silicon Power Darlington Transistors

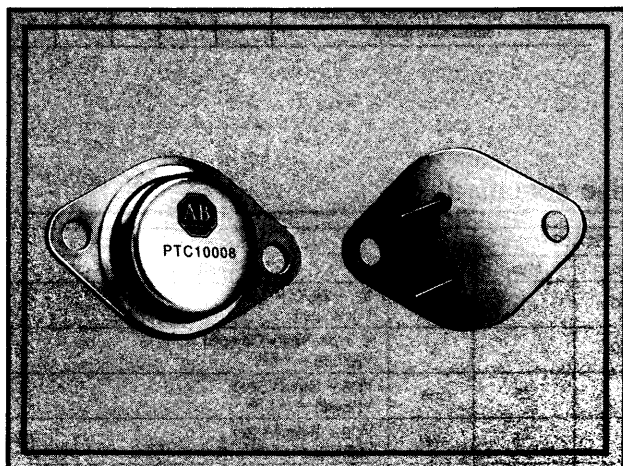
20 Amperes • 500 Volts

### FEATURES

- High Voltage Rating – 500 Volts Sustaining
- Glass Passivated Die to Provide Excellent High Temperature Stability

### APPLICATIONS

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

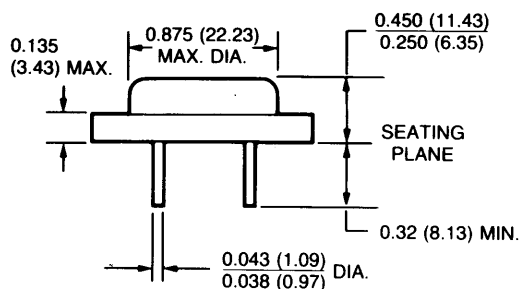
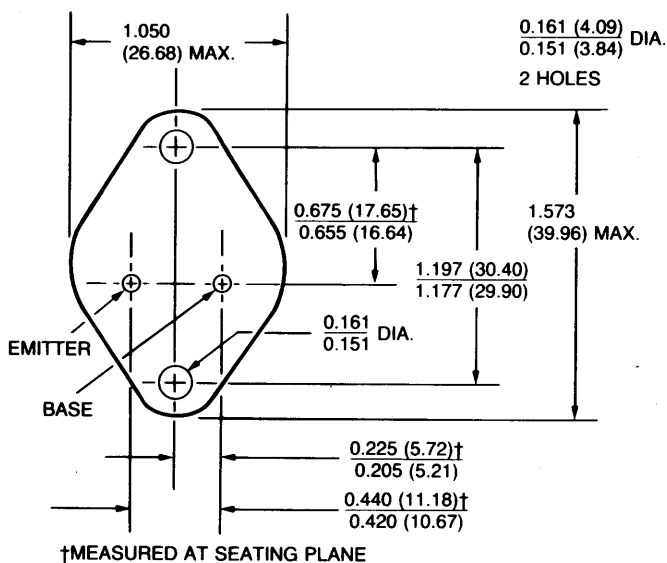
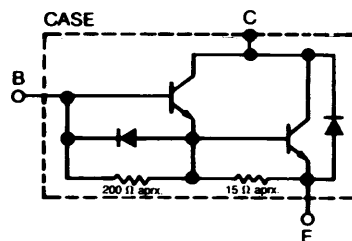


## SPECIFICATIONS

### General

The PTC 10008 and PTC 10009 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-204MA

AVAILABLE IN STANDARD VALUES FROM STOCK AT ELECTRONIC DISTRIBUTORS.

# SERIES PTC 10008/10009

## High Voltage Fast Switching NPN Darlington

### Absolute maximum ratings

Description	PTC 10008	PTC 10009	Unit	Conditions
VCBO Collector-Base Voltage	650	700	Volts	
VCEO(sus) Collector-Emitter Voltage	450	500	Volts	
VCEX(sus) Collector-Emitter Voltage	450	500	Volts	
IC Collector Current Continuous	20		A	
IC Collector Current Peak	30		A	
IB Base Current Continuous	2.5		A	
IB Base Current Peak	5.0		A	
PD Maximum Power Dissipation	175		W	TC = 25°C
IE Emitter Current Continuous	20		A	
IE Emitter Current Peak	30		A	

### Thermal and mechanical characteristics

Description	Type	Min.	Typ.	Max.	Unit
RθJC Thermal Resistance Junction to Case	All			1.0	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds					
U, STG Operating and Storage Junction Temperature Range		-65		200	°C

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

Description	PTC 10008		PTC 10009		Unit	Conditions
	Min.	Max.	Min.	Max.		
VCEO(sus) Collector-Emitter Sustaining Voltage	450		500		V	IC = 2A, L = 2mH Unclamped
VCEX(sus) Collector-Emitter Sustaining Voltage	450		500		V	IC = 2A VBE(off) = -5V
ICEV Collector Cutoff Current		0.25		0.25	mA	VCE = Rated VCEO VBE(off) = -1.5V
		5		5	mA	VCE = Rated VCEO VBE(off) = -1.5V, TC = +100°C
IEBO Emitter Cutoff Current		175		175	mA	VBE = 2V
VCE(sat) Collector-Emitter Saturation Voltage		2.0		2.0	V	IC = 10A, IB = 500mA
		2.5		2.5	V	IC = 10A, IB = .5A, TC = +100°C
		3.5		3.5	V	IC = 20A, IB = 2A
VBE(sat) Base-Emitter Saturation Voltage		2.5		2.5	V	IC = 10A, IB = 500mA
hFE DC Current Gain	40	400	40	400		IC = 5A, VCE = 5V
	30	300	30	300		IC = 10, VCE = 5V
VF Diode Forward Voltage		5		5	V	IF = 10A
Is/b Second Breakdown Collector Current	17.5		17.5		A	VCE = 10V, Non Rep. tp = 1s

### Switching characteristics

Description - Resistive Load	Min.	Max.	Min.	Max.	Unit	Conditions
td Delay Time		0.25		0.25	μs	VCC = 250V, IC = 10A IB1 = 0.5A, IB2 = 2A, tp = 20μs VBE(off) = -6V
tr Rise Time		1.5		1.5	μs	
ts Storage Time		2.0		2.0	μs	
tf Fall Time		0.6		0.6	μs	
Description - Inductive Load, Clamped	Min.	Max.	Min.	Max.	Unit	Conditions
tsv Storage Time		3.0		3.0	μs	Vclamp = VCEX, IC = 10A IB1 = 0.5A, IB2 = 2A
tc Crossover Time		0.5		0.5		VBE(off) = -6V, L = 200μH
tsv Storage Time		4.0		4.0	μs	Vclamp = 250V, TC = +100°C IB1 = 0.5A, IB2 = 2A, IC = 10A
tc Crossover Time		1.5		1.5	μs	VBE(off) = -6V, L = 200μH



# Series PTC 10015, PTC 10016 NPN Silicon Power Darlington Transistors

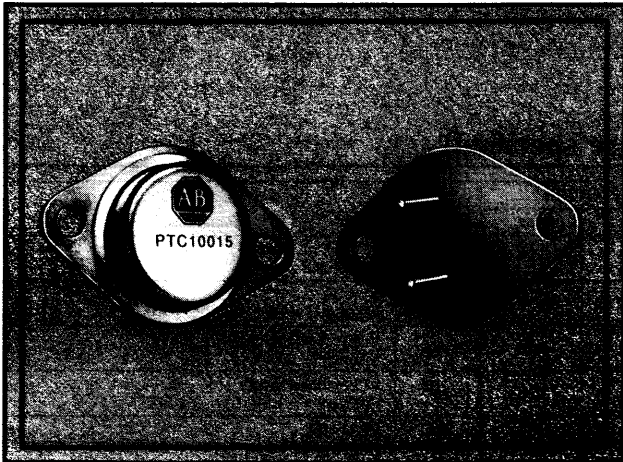
50 Amperes • 500 Volts

## FEATURES

- High Voltage Rating – 500 Volts Sustaining
- Glass Passivated Die to Provide Excellent High Temperature Stability
- Overload Short Circuit Rating

## APPLICATIONS

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

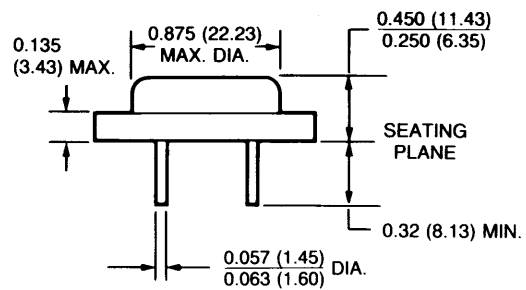
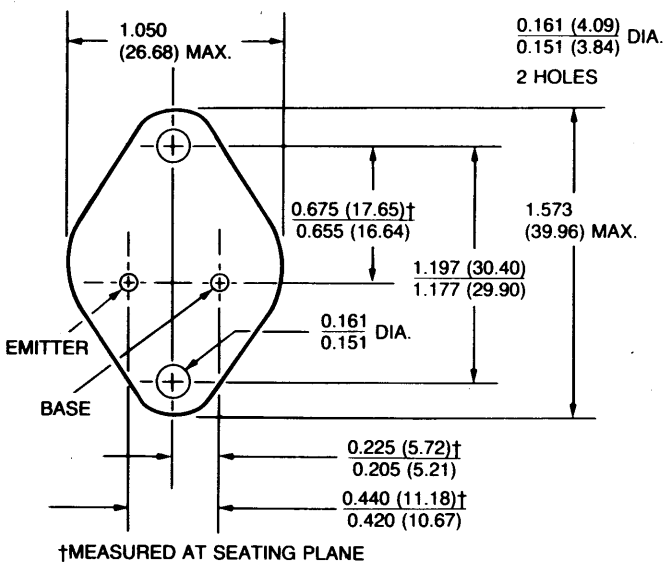
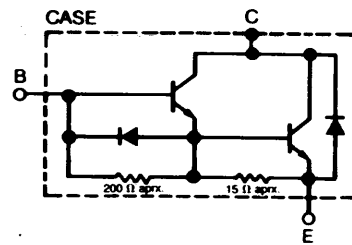


## SPECIFICATIONS

### General

The PTC 10015 and PTC 10016 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 MODIFIED TO-3

AVAILABLE IN STANDARD VALUES FROM STOCK AT ELECTRONIC DISTRIBUTORS.

# SERIES PTC 10015/10016

## High Voltage Fast Switching NPN Darlington

### Absolute maximum ratings

Description	PTC 10015	PTC 10016	Unit	Conditions
VCBO Collector-Base Voltage	600	700	Volts	
VCEO(sus) Collector-Emitter Voltage	400	500	Volts	
VCEX(sus) Collector-Emitter Voltage	400	500	Volts	
IC Collector Current Continuous	50		A	
IC Collector Current Peak	75		A	
IB Base Current Continuous	10		A	
IB Base Current Peak	15		A	
PD Maximum Power Dissipation	250		W	TC = 25°C
IE Emitter Current Continuous	50		A	
IE Emitter Current Peak	75		A	

### Thermal and mechanical characteristics

Description	Type	Min.	Typ.	Max.	Unit
R <sub>θJC</sub> Thermal Resistance Junction to Case	All			.7	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds					
t <sub>J</sub> , ISTG Operating and Storage Junction Temperature Range		-65		200	°C

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

Description	PTC 10015		PTC 10016		Unit	Conditions
	Min.	Max.	Min.	Max.		
VCEO(sus) Collector-Emitter Sustaining Voltage	400		500		V	IC = 2A, L = 2mH Unclamped
VCEX(sus) Collector-Emitter Sustaining Voltage	400		500		V	IC = 1A VBE(off) =
ICEV Collector Cutoff Current		0.25		0.25	mA	VCE = Rated VCBO VBE(off) = -1.5V
		5		5	mA	VCE = Rated VCBO VBE(off) = -1.5V, TC = +100°C
IEBO Emitter Cutoff Current		350		350	mA	VEB = 2V
VCE(sat) Collector-Emitter Saturation Voltage		2.2		2.2	V	IC = 20A, IB = 1.0A
		2.6		2.6	V	IC = 20A, IB = 1.0A, TC = +100°C
		5.0		5.0	V	IC = 50A, IB = 10A
VBE(sat) Base-Emitter Saturation Voltage		2.75		2.75	V *	IC = 20A, IB = 1.0A
hFE DC Current Gain		25		25		IC = 20, VCE = 5V
		10		10		IC = 40A, VCE = 5V
VF Diode Forward Voltage		5		5		IF = 20A
I <sub>s/b</sub> Second Breakdown Collector Current	25		25			VCE = 10V, Non Rep. tp = 1s

### Switching characteristics

Description - Resistive Load	Min.	Max.	Min.	Max.	Unit	Conditions
t <sub>d</sub> Delay Time		0.3		0.3	μs	VCC = 250V, IC = 20A IB1 = 1A, IB2 = 4A, tp = 20μs VBE(off) = -6V
t <sub>r</sub> Rise Time		1.0		1.0	μs	
t <sub>s</sub> Storage Time		2.5		2.5	μs	
t <sub>f</sub> Fall Time		1.0		1.0	μs	
Description - Inductive Load, Clamped	Min.	Max.	Min.	Max.	Unit	Conditions
t <sub>sv</sub> Storage Time		3.0		3.0		Vclamp = 250V, IC = 20A IB1 = 1A, IB2 = 4A
t <sub>c</sub> Crossover Time		1.0		1.0		VBE(off) = -6V, L = 200μH
t <sub>sv</sub> Storage Time		5.6		5.6		Vclamp = 250V, TC = +100°C IB1 = 1A, IB2 = 2A, IC = 20A
t <sub>c</sub> Crossover Time		3.0		3.0		VBE(off) = -6V, L = 200μH



# Series PTC 10020, PTC 10021

## NPN Silicon Power Darlington Transistors

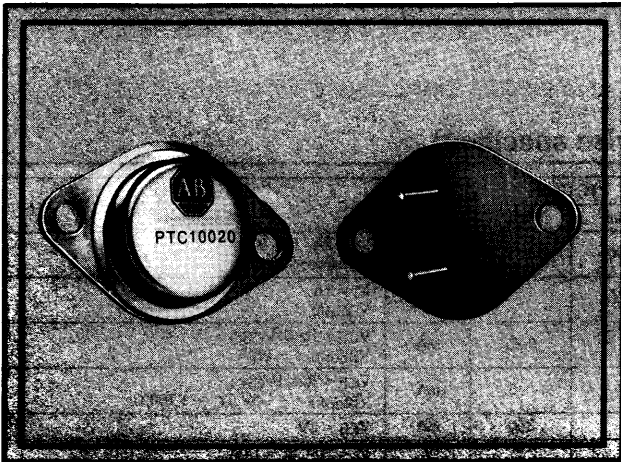
60 Amperes • 250 Volts

### FEATURES

- High Voltage Rating – 250 Volts Sustaining
- Glass Passivated Die to Provide Excellent High Temperature Stability
- Overload Short Circuit Rating

### APPLICATIONS

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

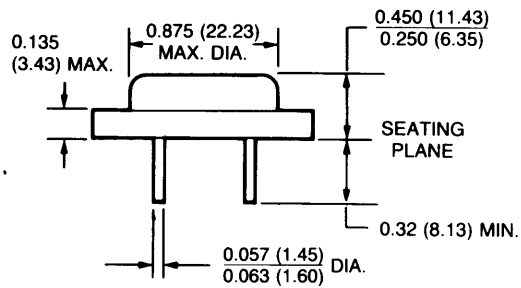
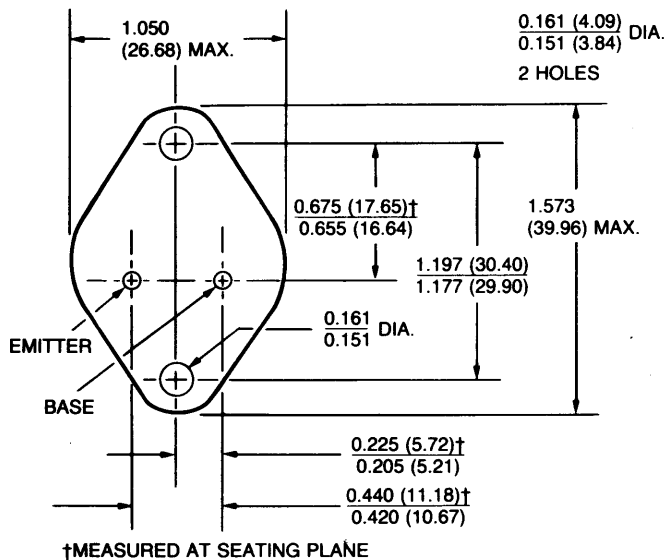
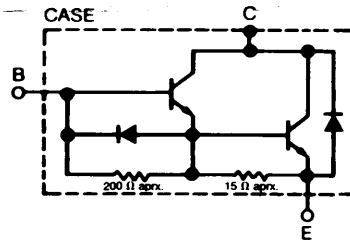


## SPECIFICATIONS

### General

The PTC 10020 and PTC 10021 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 MODIFIED TO-3

AVAILABLE IN STANDARD VALUES FROM STOCK AT ELECTRONIC DISTRIBUTORS.

# SERIES PTC 10020/10021

## High Voltage Fast Switching NPN Darlington

### Absolute maximum ratings

Description	PTC 10020	PTC 10021	Unit	Conditions
VCBO Collector-Base Voltage	300	350	Volts	
VCEO(sus) Collector-Emitter Voltage	200	250	Volts	
VCEX(sus) Collector-Emitter Voltage	200	250	Volts	
IC Collector Current Continuous	60		A	
IC Collector Current Peak	100		A	
IB Base Current Continuous	20		A	
IB Base Current Peak	30		A	
PD Maximum Power Dissipation	250		W	TC = 25°C
IE Emitter Current Continuous	60		A	
IE Emitter Current Peak	100		A	

### Thermal and mechanical characteristics

Description	Type	Min.	Typ.	Max.	Unit
RθJC Thermal Resistance Junction to Case	All			.7	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds					
				275	°C
tj, ISTG Operating and Storage Junction Temperature Range		-65		200	°C

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

Description	PTC 10020		PTC 10021		Unit	Conditions
	Min.	Max.	Min.	Max.		
VCEO(sus) Collector-Emitter Sustaining Voltage	200		250		V	IC = 2A, L = 2mH Unclamped
VCEX(sus) Collector-Emitter Sustaining Voltage	250		300		V	IC = 1A VBE(off) = -5V
ICEV Collector Cutoff Current		0.25		0.25	mA	VCE = Rated VCBO VBE(off) = -1.5V
		5		5	mA	VCE = Rated VCBO VBE(off) = -1.5V, TC = +100°C
IEBO Emitter Cutoff Current		175		175	mA	VEB = 2V
VCE(sat) Collector-Emitter Saturation Voltage		2.2		2.2	V	IC = 30A, IB = 1.2A
		2.4		2.4	V	IC = 30A, IB = 1.2A, TC = +100°C
		4.0		4.0	V	IC = 60A, IB = 4.0A
VBE(sat) Base-Emitter Saturation Voltage		3.0		3.0	V	IC = 30A, IB = 1.2A
hFE DC Current Gain	75	1000	75	1000		IC = 15A, VCE = 5V
	15		15			IC = 60A, VCE = 4V
VF Diode Forward Voltage		5		5	V	IF = 30A
Is/b Second Breakdown Collector Current	25		25		A	VCE = 10V, Non Rep. tp = 1s

### Switching characteristics

Description - Resistive Load	Min.	Max.	Min.	Max.	Unit	Conditions
td Delay Time		0.2		0.2	μs	VCC = 175V, IC = 30A IB1 = 1A, IB2 = 4A, tp = 20μs VBE(off) = -6V
tr Rise Time		1.0		1.0	μs	
ts Storage Time		3.5		3.5	μs	
tf Fall Time		0.5		0.5	μs	
Description - Inductive Load, Clamped	Min.	Max.	Min.	Max.	Unit	Conditions
tsv Storage Time		3.6		3.6		Vclamp = 175V, IC = 30A IB1 = 1A, IB2 = -4A VBE(off) = -6V, L = 200μH
tc Crossover Time		0.7		0.7		
tsv Storage Time		4.5		4.5	μs	Vclamp = 175V, TC = +100°C IB1 = 1A, IB2 = 4A, IC = 30A
tc Crossover Time		2.0		2.0	μs	VBE(off) = -6V, L = 200μH



# Series PTC 10022, PTC 10023 NPN Silicon Power Darlington Transistors

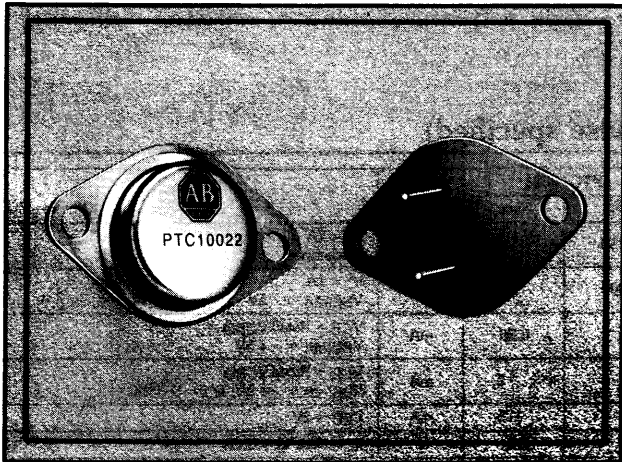
40 Amperes • 400 Volts

## FEATURES

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

## APPLICATIONS

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

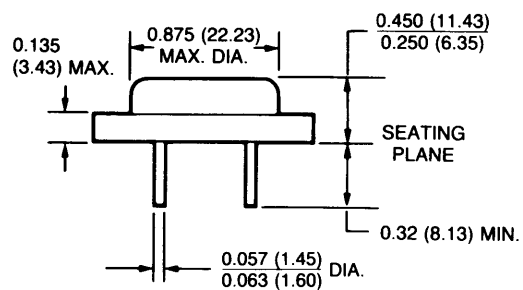
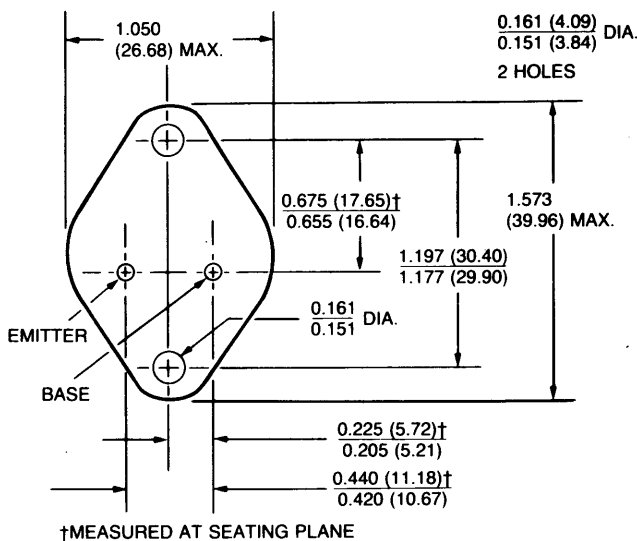
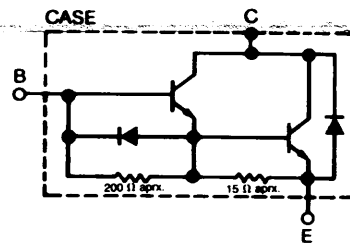


## SPECIFICATIONS

### General

The PTC 10022 and PTC 10023 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 MODIFIED TO-3

AVAILABLE IN STANDARD VALUES FROM STOCK AT ELECTRONIC DISTRIBUTORS.