

Technical Specifications

B-TRAN®, 1200V/75A, Normally-On Bidirectional Switch in a Double-Sided Cooled, Isolated TO-264 Package

Part Number: IPAD01208A04

General Description

This Bidirectional Bipolar Junction Transistor (B-TRAN®) is a normally-on, double-sided cooled device designed for high-efficiency static switching applications. Featuring ultra-low on-state voltage drop and best-in-class bidirectional operation, the B-TRAN® reduces conduction losses and enables simplified circuit designs by minimizing the need for additional components. Its robust construction, positive temperature coefficient for easy paralleling, and isolated TO-264 package provide superior thermal performance and reliability. The device is ideally suited for use in solid-state circuit breakers, battery disconnect switches, DC contactors, and automatic transfer switches, where low loss and compact system integration are critical.





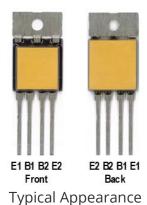
Key Features:

- V_{E1E2} = 1200V
- I_{F1F2} = 75A
- Maximum Junction Temperature T_{jmax} = 150°C
- Best-in-Class Bidirectional Switching Operation
- Ultra-Low On-State Voltage Drop
- Double-Sided Cooling
- Reduction of System Components
- Easy Paralleling Capability Due to Positive Temperature Coefficient
- Switching Frequency: 10 kHz
- Low Parasitic Inductance and Capacitance

B1 B2 E2 Device Circuit Symbol

Applications:

- DC Bidirectional Solid-State Circuit Breaker
- AC Solid-State Circuit Breaker
- Battery Disconnect Switch
- DC Contactor
- Automatic Transfer Switch







1 B-TRAN® Package

Characteristic values

Parameter	Symbol	Conditions	Value		Unit	
			Min.	Тур.	Max.	
Storage temperature	T_{stg}	I _{E1E2} = 100 μA	-55		150	°C
Soldering temperature	T_{sold}	wave soldering 1.6 mm (0.063 in.) from case for 10 s			200	°C
Thermal resistance, junction-case	R _{th(j-c)}	single side measurement		0.10	0.12	K/W

2 B-TRAN® DC Electrical Characteristics

Maximum Ratings

Parameter	Symbol	Value	Unit	
Blocking voltage	V_{BR}	1200	V	
DC emitter current				
$T_c = 25^{\circ}C$	ΙE	100	Α	
$T_c = 100^{\circ}C$		80	Α	
Pulsed emitter current	I _{Epulse}	300	Α	
Emitter-Base diode breakdown voltage	V _{EB}	45	V	
Short circuit withstand time	t _{SC}	10	μs	
Power dissipation $T_C = 25^{\circ}C$	P _{tot}	2500	W	
Power dissipation $T_C = 100^{\circ}C$		1000		
With double-sided cooling				
Operating junction temperature	T_{vj}	-55+150	°C	





Parameter	Symbol	Conditions	Value			Unit
			Min.	Тур.	Max.	
Blocking voltage	$V_{BR(E1B2)}$ or $V_{BR(E2B1)}$	I _{E1E2} = 100 μA	1200	-	-	V
Emitter-Emitter saturation voltage	V _{E1E2(on)}	I_{B1E1} or I_{B2E2} =16A, I_{E1E2} =70A at 25°C	0.45	0.56	0.65	V
		I_{B1E1} or I_{B2E2} =18A, I_{E1E2} =70A at 150°C	0.64	0.72	0.8	V
Base-Emitter voltage (on-state)	V_{B1E1} or V_{B2E2}	I _{B1E1} or I _{B2E2} = 1A	0.8	1.3	1.5	V
Emitter-Base breakdown voltage (off-state)	$V_{R(B1E1)}$ or $V_{R(B2E2)}$	I _{E1B1} or I _{E2B2} = 1mA	45	50	70	V
DC current gain	h _{FE}	I _{E1E2} = 15A		7	9	
	h _{FE}	I _{E1E2} = 30A		5	7	
	h _{FE}	I _{E1E2} = 75A		4.5	6	





3 B-TRAN® DRIVING Characteristics

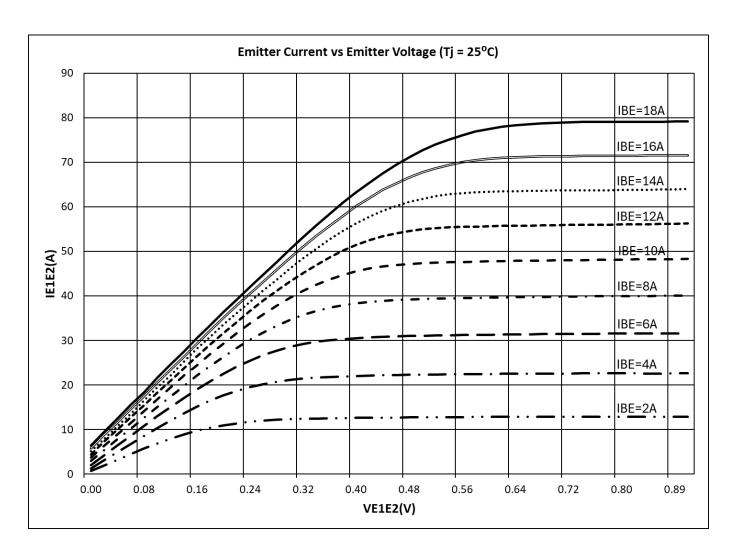


Figure 1: Typical output characteristic at 25°C





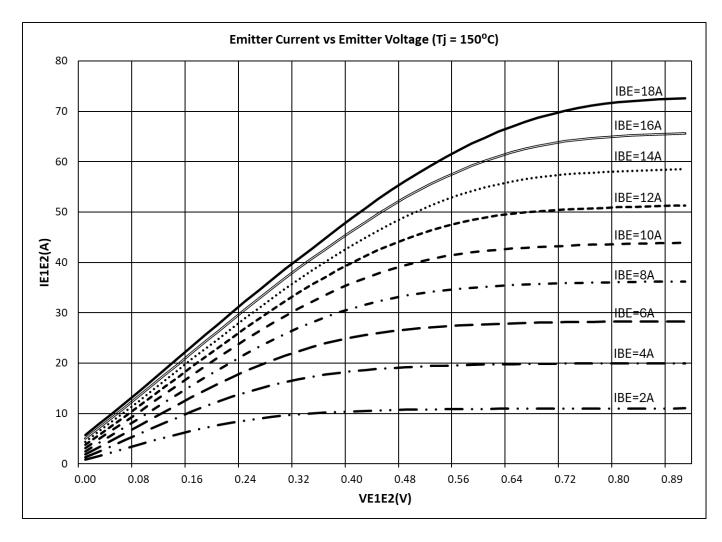


Figure 2: Typical output characteristic at 150°C



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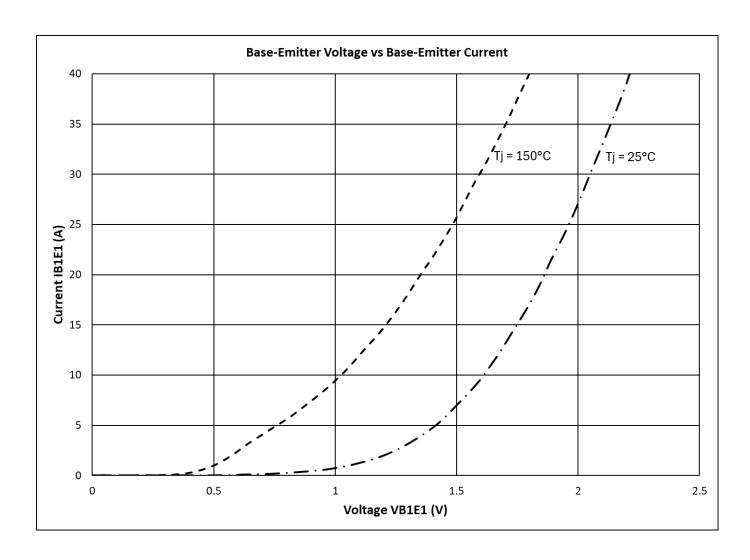


Figure 3: Typical driving characteristic



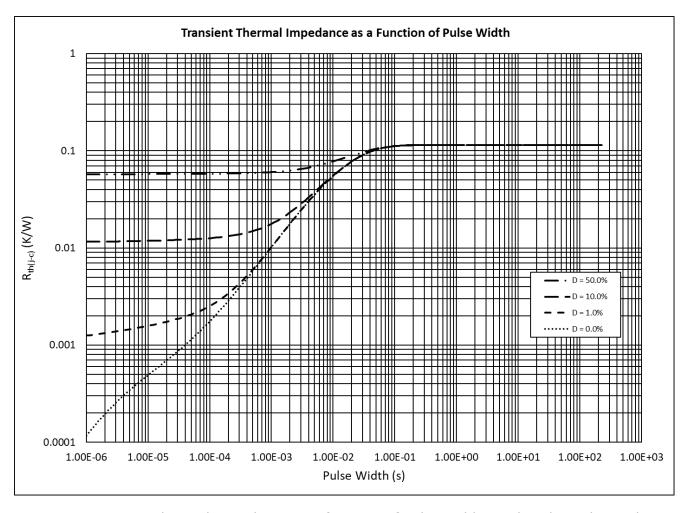


Figure 4: Transient thermal impedance as a function of pulse width (single side cooling only)



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4 B-TRAN® Switching Characteristics

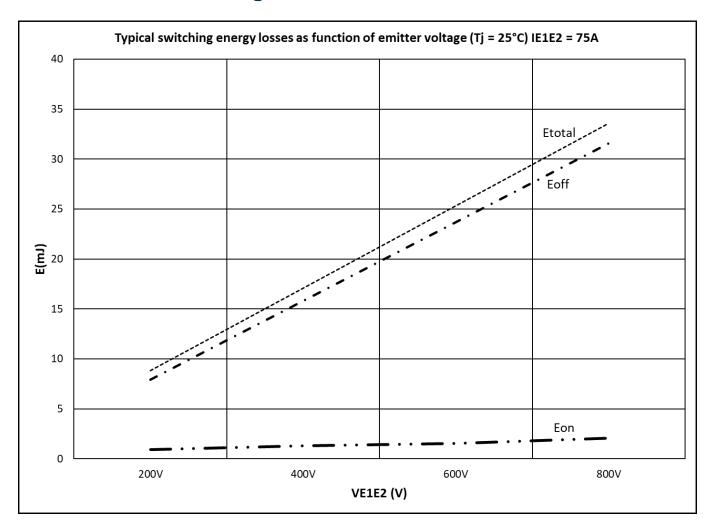


Figure 5: Typical switching energy losses as function of emitter voltage



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5 B-TRAN® Package Information

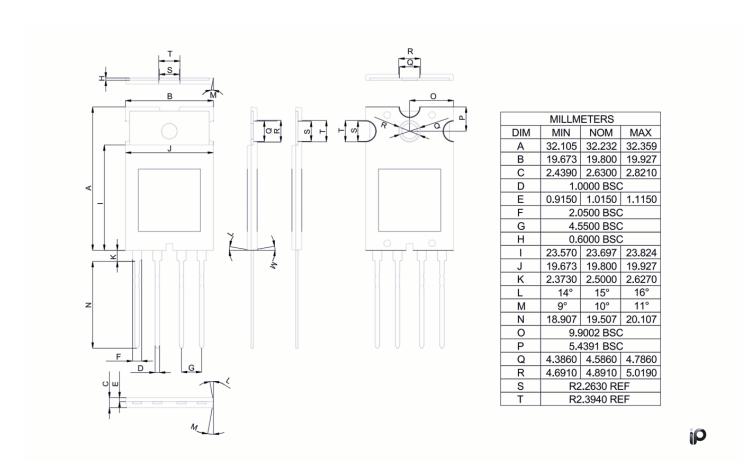


Figure 6: Mechanical outline of TO-264 package





Important Notices

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