Data Sheet

HIGH EFFICIENCY POWER SCHOTTKY RECTIFIER MBR2045C

General Description

High efficiency dual Schottky rectifier suited for switch mode power supplies and other power converters. This device is intended for use in medium voltage operation, and particularly, in high frequency circuits where low switching losses and low noise are required.

MBR2045C is available in TO-220-3, TO-220-3 (2) and TO-220F-3 packages.

Main Product Characteristics

$I_{F(AV)}$	2×10A
V_{RRM}	45V
T_J	150°C
V_F(max)	0.57V

Features

- Low Forward Voltage: 0.57V @ 125°C
- Low Power Loss/High Efficiency
- 150°C Operating Junction Temperature
- 20A Total (10A Each Diode Leg)
- Guard-ring for Stress Protection
- High Surge Capacity
- Pb-free Package

Mechanical Characteristics

- Case: Epoxy, Molded
- Epoxy Meets UL 94V-0 @ 0.125in.
- Weight (Approximately):
  1.9Grams (TO-220-3, TO-220-3 (2) and TO-220F-3)
- Finish: All External Surfaces Corrosion Resistant and Terminal
- Leads are Readily Solderable
- Lead Temperature for Soldering Purposes:
  260°C Maximum for 10 Seconds

Applications

- Power Supply Output Rectification
- Power Management
- Instrumentation

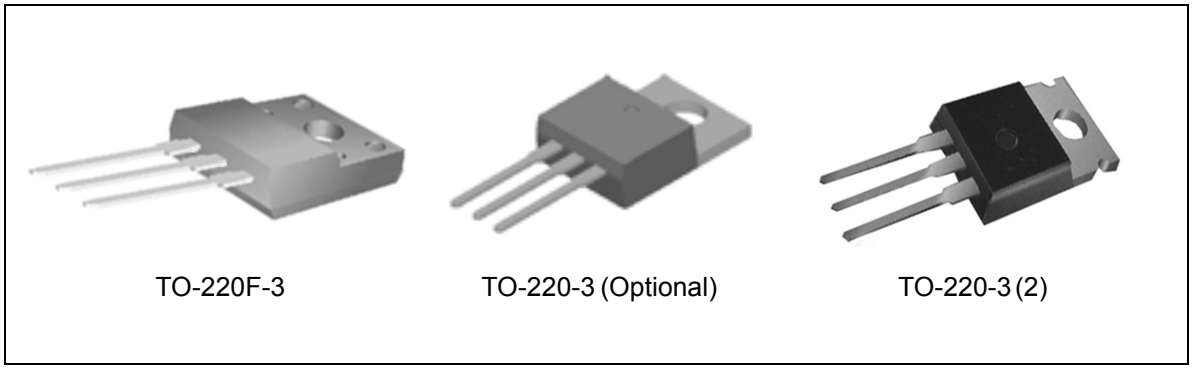


Figure 1. Package Types of MBR2045C

Pin Configuration

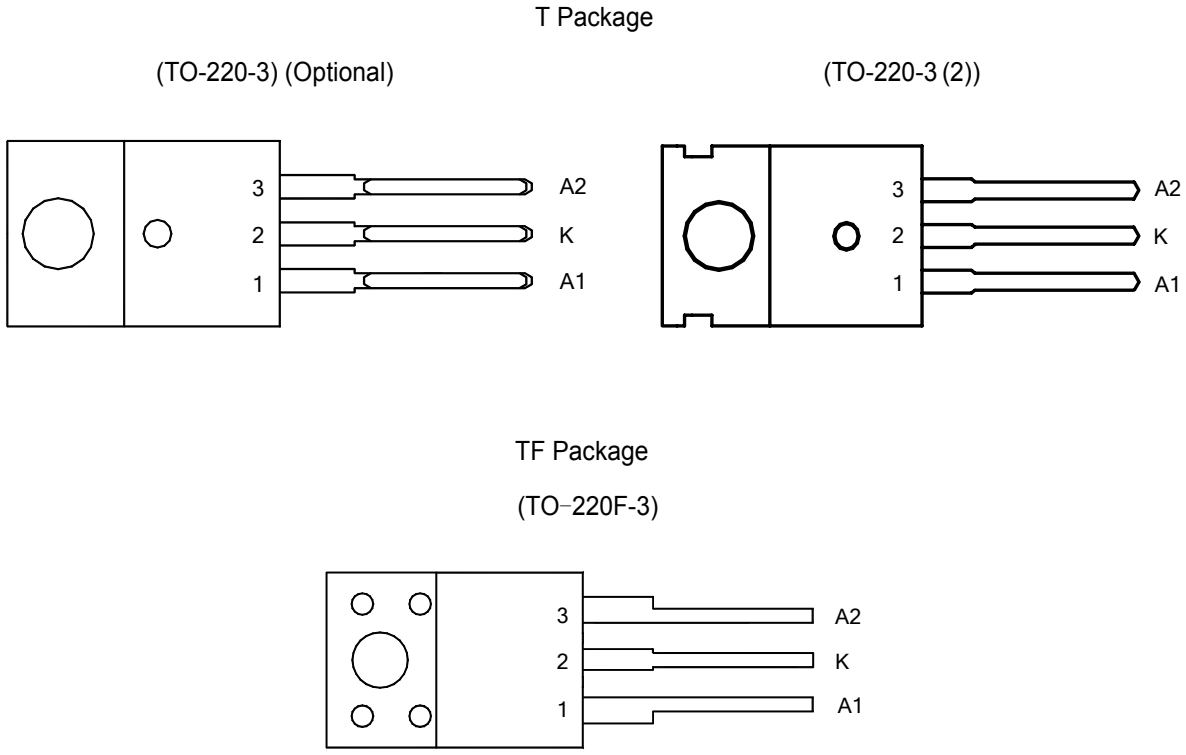


Figure 2. Pin Configuration of MBR2045C (Top View)

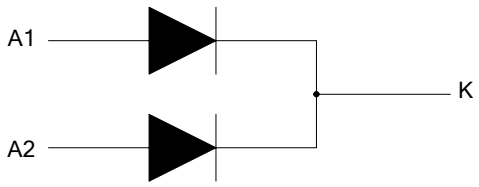
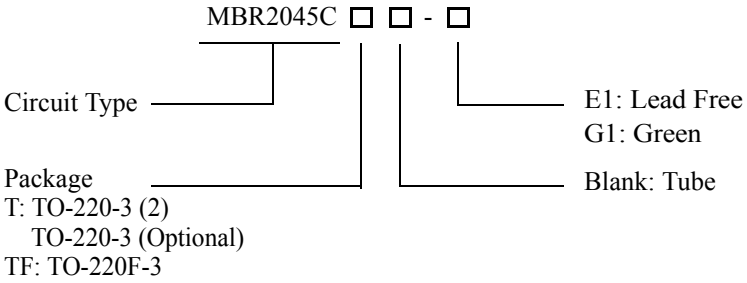


Figure 3. Internal Structure of MBR2045C

HIGH EFFICIENCY POWER SCHOTTKY RECTIFIER MBR2045C

Ordering Information



Package	Part Number		Marking ID		Packing Type
	Lead Free	Green	Lead Free	Green	
TO-220-3 (2)	MBR2045CT-E1	MBR2045CT-G1	MBR2045CT-E1	MBR2045CT-G1	Tube
TO-220F-3	MBR2045CTF-E1	MBR2045CTF-G1	MBR2045CTF-E1	MBR2045CTF-G1	Tube

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant. Products with "G1" suffix are available in green packages.

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Absolute Maximum Ratings (Each Diode Leg) (Note 1)

Parameter	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	45	V
Average Rectified Forward Current (Rated V_R) T_C=139°C	$I_{F(AV)}$	10	A
Peak Repetitive Forward Current (Rated V_R, Square Wave, 20kHz) T_C=137°C	I_{FRM}	20	A
Non Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Half Wave, Single Phase, 60Hz)	I_{FSM}	150	A
Peak Repetitive Reverse Surge Current (2.0μs, 1.0kHz)	I_{RRM}	1.0	A
Operating Junction Temperature (Note 2)	T_J	150	°C
Storage Temperature Range	T_{STG}	-65 to 150	°C
Voltage Rate of Change (Rated V_R)	dv/dt	10000	V/μs
ESD (Machine Model=C)		>400	V
ESD (Human Body Model=3B)		>8000	V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Note 2: The heat generated must be less than the thermal conductivity from Junction to Ambient: $dP_D/dT_J < 1/\theta_{JA}$.

Thermal Characteristics

Parameter	Symbol	Condition		Value	Unit
Maximum Thermal Resistance	θ_{JC}	Junction to Case	TO-220-3/ TO-220-3 (2)	2.2	°C/W
			TO-220F-3	4.5	
	θ_{JA}	Junction to Ambient	TO-220-3/ TO-220-3 (2)	60	

Electrical Characteristics (Each Diode Leg)

Parameter	Condition	Symbol	Typ	Max	Unit
Maximum Instantaneous Forward Voltage Drop (Note 3)	I_F=10A, T_C=25°C	V_F	0.59	0.65	V
	I_F=10A, T_C=125°C		0.50	0.57	
	I_F=20A, T_C=25°C		0.71	0.84	
	I_F=20A, T_C=125°C		0.67	0.72	
Maximum Instantaneous Reverse Current (Note 3)	Rated DC Voltage, T_C=125°C	I_R	5	15	mA
	Rated DC Voltage, T_C=25°C		0.01	0.1	

Note 3: Pulse Test: Pulse Width=300μs, Duty Cycle≤2.0%.

Typical Performance Characteristics

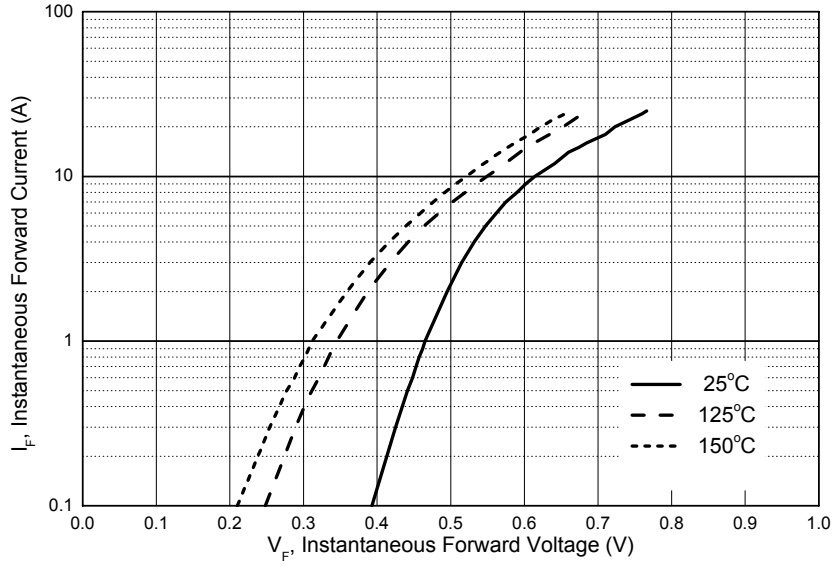


Figure 4. Typical Forward Voltage

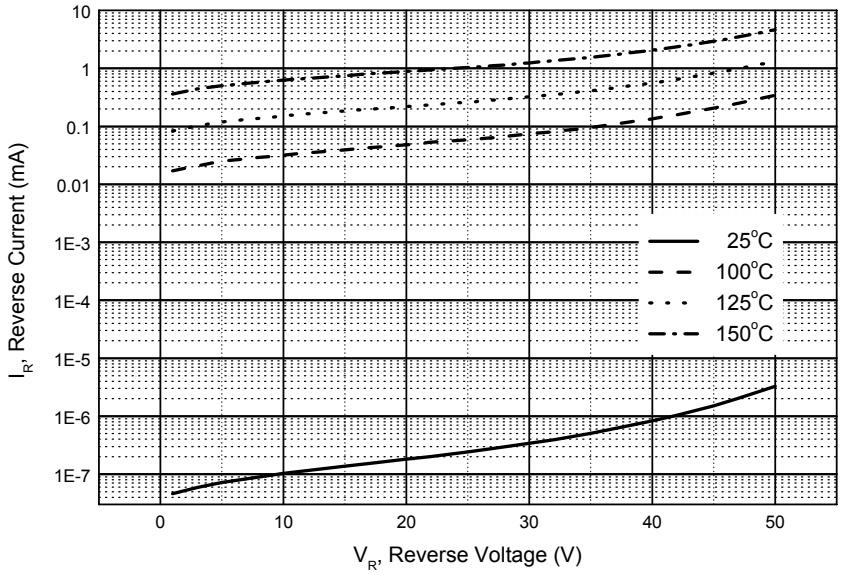


Figure 5. Typical Reverse Current

Typical Performance Characteristics (Continued)

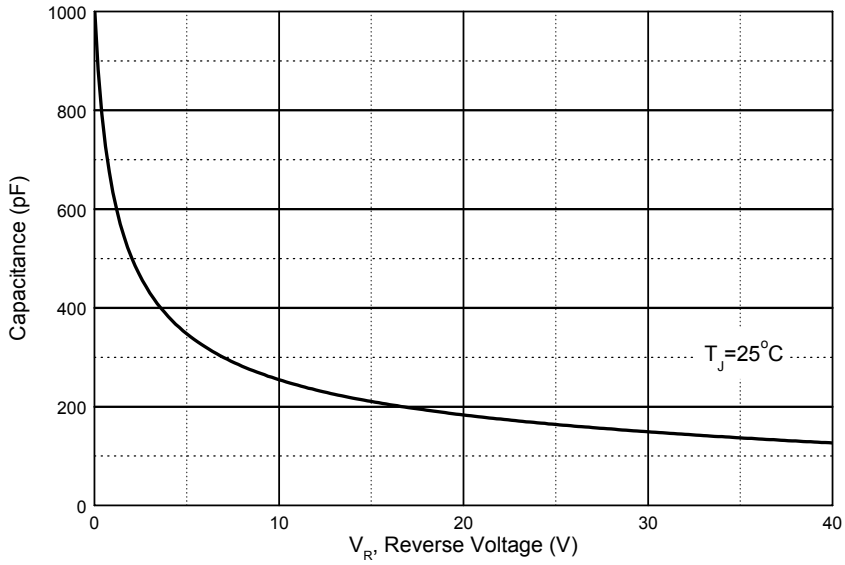


Figure 6. Capacitance vs. V_R, Reverse Voltage

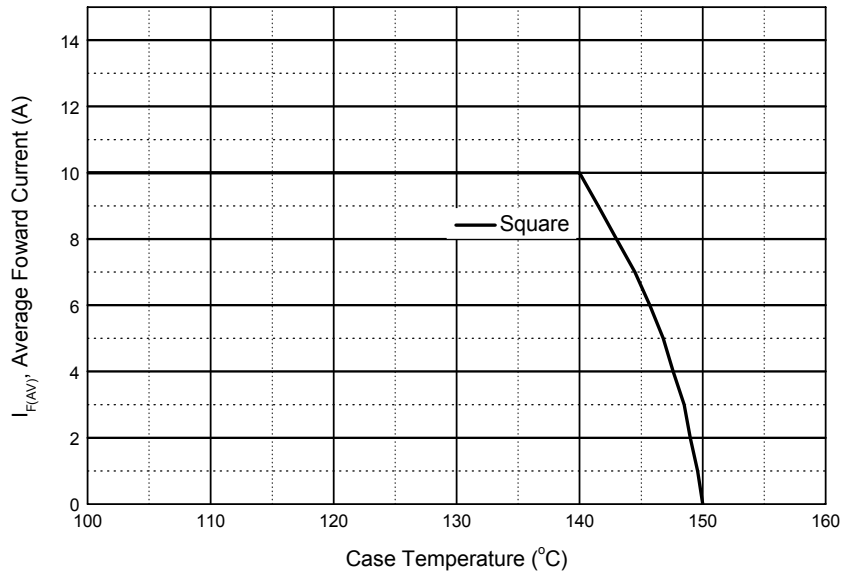
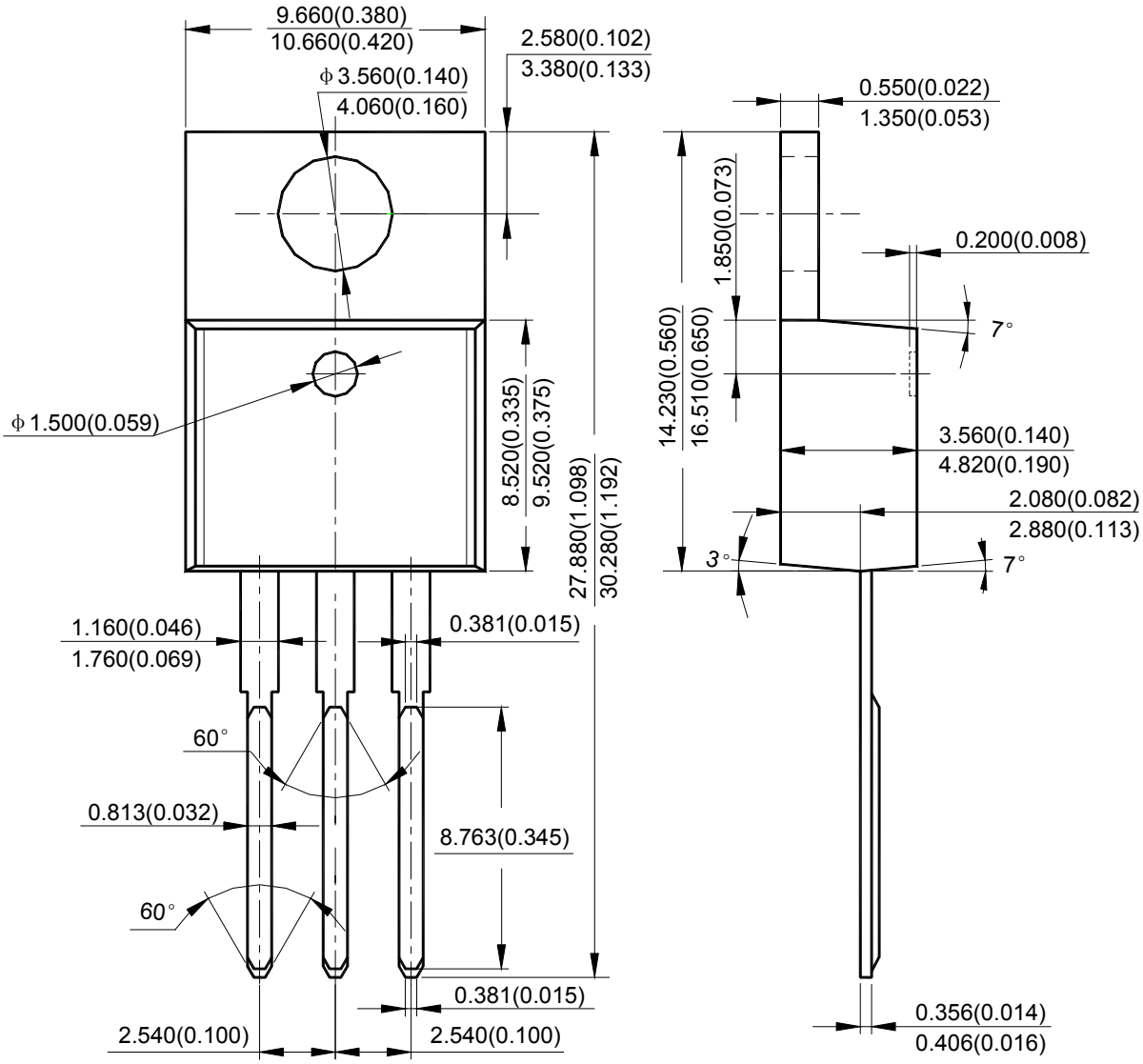


Figure 7. Average Forward Current vs. Case Temperature (Square, Each Diode)

Mechanical Dimensions

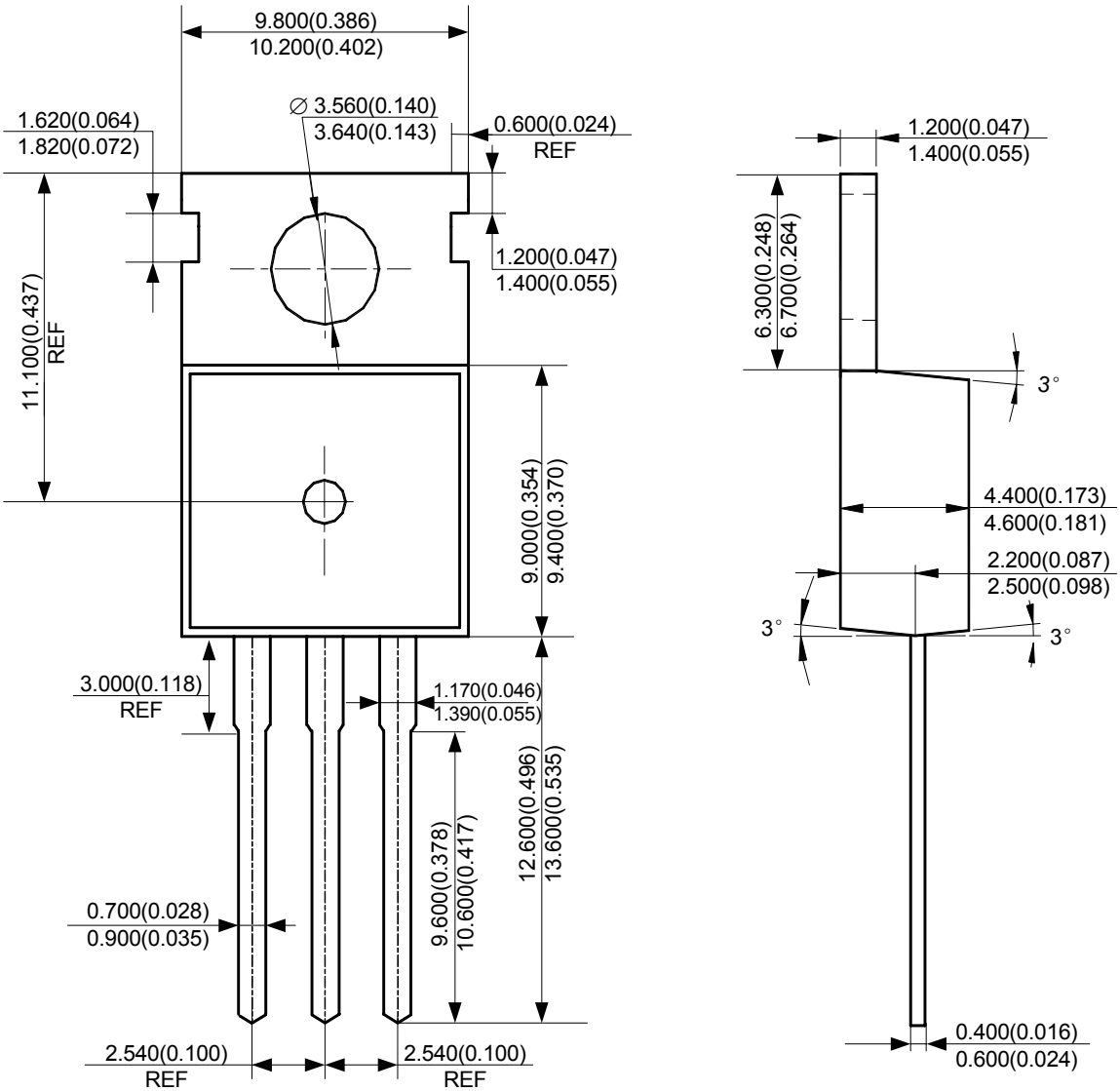
TO-220-3
(Optional)

Unit: mm(inch)



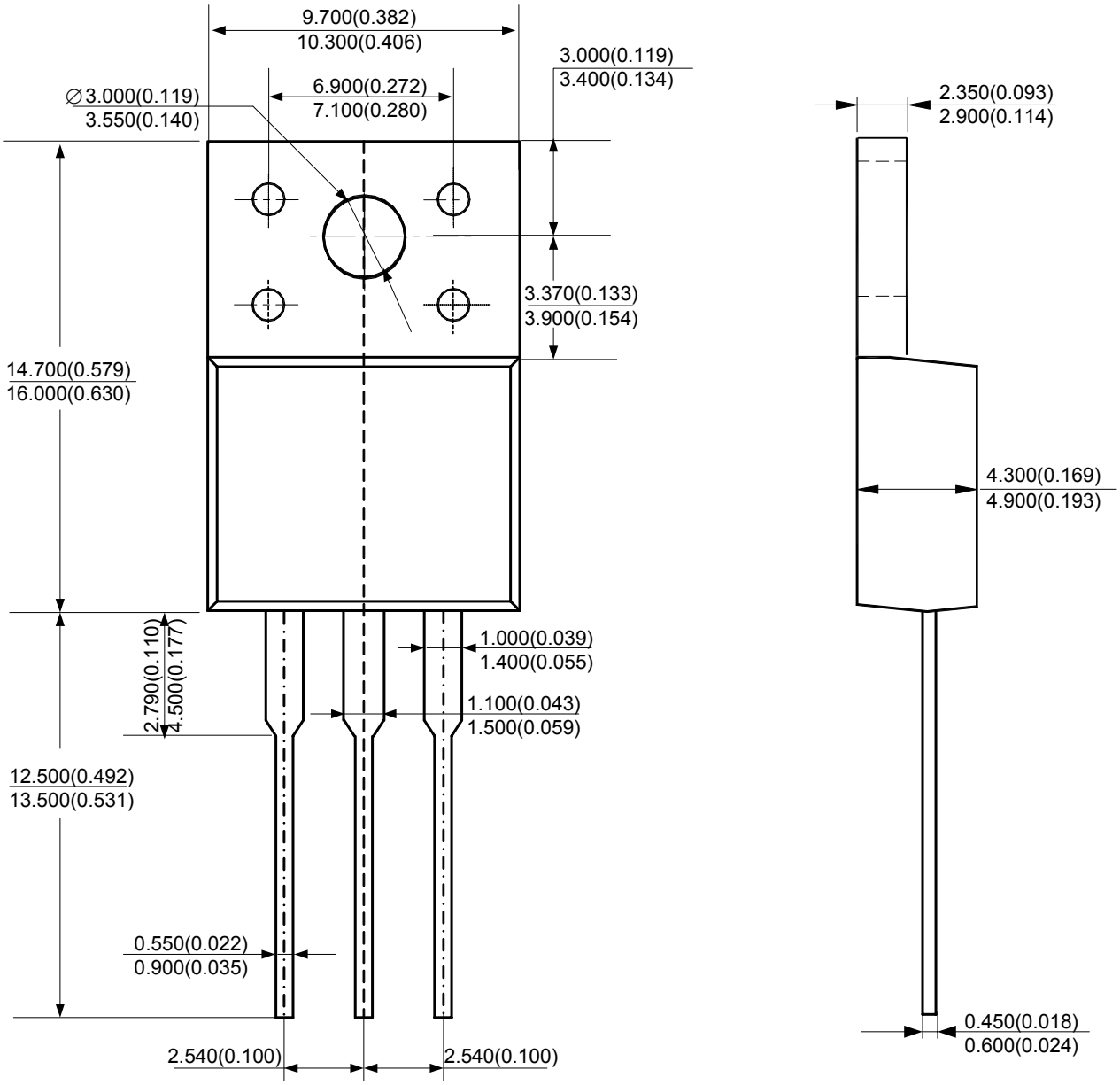
Mechanical Dimensions (Continued)

TO-220-3 (2) **Unit: mm(inch)**



Mechanical Dimensions (Continued)

TO-220F-3 **Unit: mm(inch)**



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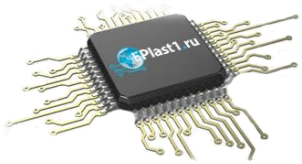

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