

# **Features**

- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant(Note 1) ("P" Suffix Designates Compliant. See Ordering Information)
- Epoxy Meets UL 94 V-0 Flammability Rating
- High Frequency Operation
- High Surge Forward Current Capability
- Planar Structure Die and Soft Recovery Characteristics

# 40 Amp Ultra Fast Recovery Rectifier 650 Volts

# Maximum Ratings @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Value	Unit	
Peak Repetitive Reverse Voltage	$V_{RRM}$			
Working Peak Reverse Voltage	V <sub>RWM</sub>	650	V	
DC Blocking Voltage	V <sub>R</sub>	V <sub>R</sub>		
RMS Reverse Voltage	V <sub>RMS</sub>	455	V	
Average Rectified Forward Current	I <sub>F(AV)</sub>	40	Α	
Non-Repetitive Peak Surge Current @8.3ms Half Sine Wave	I <sub>FSM</sub>	450	А	
Current Squared Time @ 1ms≤t≤8.3ms	l <sup>2</sup> t	840	A <sup>2</sup> s	

TO-247AD

# **Internal Structure**

Pin	Description	Simplified Outline Graphic Symb			
1	Cathode				
2	Anode	MCC	PIN 1 ∘		
		MUR4065B	PIN 2 CASE		
		1 2			

Note: 1. High Temperature Solder Exemption Applied, See EU Directive Annex 7a.

DIM	INCHES		MM		NOTE
DIM	MIN	MAX	MIN	MAX	NOTE
Α	0.602	0.642	15.30	16.30	
В	0.799	0.839	20.30	21.30	
С	0.189	0.205	4.80	5.20	
D	0.242		6.	15	BSC.
E	0.091	0.106	2.30	2.70	
F	0.768	0.807	19.50	20.50	
G		0.189		4.80	
Ι	0.428		10.88		BSC.
I	0.075	0.087	1.91	2.21	
٦	0.044	0.054	1.11	1.36	
K	0.189	0.205	4.80	5.20	
0	0.073	0.085	1.85	2.15	
Ρ	0.087	0.103	2.21	2.61	
Q	0.020	0.030	0.51	0.75	
R	0.512	0.535	13.00	13.60	
S	0.640	0.663	16.25	16.85	
Τ	0.134	0.150	3.40	3.80	Ф
U		0.287		7.30	Ф



# Thermal characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
TJ	Operating Junction Temperature Range		-55		175	°C
T <sub>stg</sub>	Storage Temperature Range		-55		175	°C
Rth <sub>(J-C)</sub>	Thermal Resistance from Junction to Case			0.5		°C/W
Rth <sub>(J-A)</sub>	Thermal Resistance from Junction to Ambient	Free in Air		40		°C/W

# Electrical Characteristics @ 25°C Unless Otherwise Specified

Parameter	Symbol	Test Conditions	Min	Тур	Max	Unit
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =40A;T <sub>J</sub> =25°C		1.46	1.80	V
		I <sub>F</sub> =40A;T <sub>J</sub> =125°C		1.18	1.45	V
Reverse Current	I <sub>R</sub>	V <sub>R</sub> =650V;T <sub>J</sub> =25°C			10	
		V <sub>R</sub> =650V;T <sub>J</sub> =125°C			500	μA
Junction Capacitance	CJ	V <sub>R</sub> =4V;f=1MHz;T <sub>J</sub> =25°C		195		pF

# Dynamic Recovery Characteristics @ 25°C Unless Otherwise Specified

Parameter	Symbol	Test Conditions		Min	Тур	Max	Unit
		I <sub>F</sub> =0.5A; I <sub>R</sub> =1.0A;I <sub>RR</sub> =0.25A;T <sub>J</sub> =25°C			40	50	
		I <sub>F</sub> =1A;d <sub>iF</sub> /d <sub>t</sub> =-100A/μs;V <sub>RM</sub> =30V;T <sub>J</sub> =25°C			37		
Reverse Recovery Time	t <sub>rr</sub>		T <sub>J</sub> =25°C		52		ns
			T <sub>J</sub> =125°C		80		
Dools Docessons Current	I <sub>RRM</sub>	I <sub>F</sub> =40A   d <sub>iF</sub> /d <sub>t</sub> =-1000A/μs	T <sub>J</sub> =25°C		22		Α
Peak Recovery Current		V <sub>RM</sub> =400V	T <sub>J</sub> =125°C		37		A
Reverse Recovery Charge Q <sub>rr</sub>	0		T <sub>J</sub> =25°C		732		nC
	<b>α</b> <sub>π</sub>	T <sub>J</sub> =125°C		2158		1110	



# **Curve Characteristics**

50

Fig. 1 - Forward Current Derating Curve

Average Forward Current (A) 10 25 50 100 125 n 75 150 175 Case Temperature (°C)

Fig. 3 - Typical Forward Characteristics

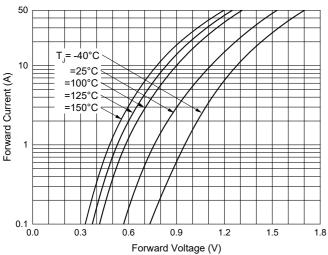


Fig. 5 - Typical Capacitance Characteristics

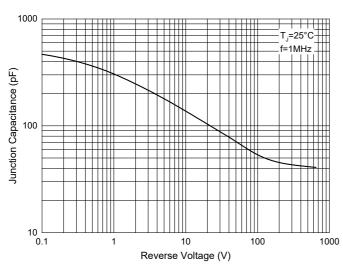


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

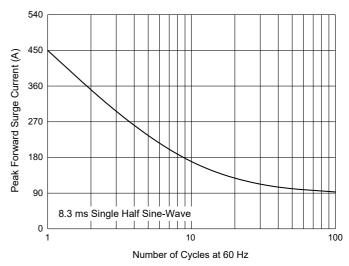


Fig. 4 - Typical Reverse Leakage Characteristics

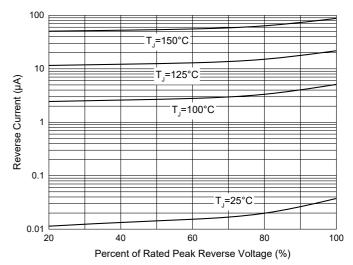
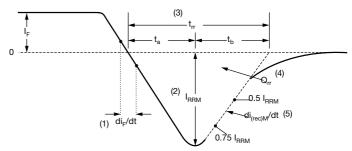


Fig. 6 - Reverse Recovery Waveform and Definitions



- (1) di<sub>F</sub>/dt rate of change of current through zero crossing
- (2) I<sub>RRM</sub> peak reverse recovery current
- (3) t<sub>rr</sub> reverse recovery time measured from zero crossing point of negative going I<sub>F</sub> to point where a line passing through 0.75 I<sub>RRM</sub> and 0.50 I<sub>RRM</sub> extrapolated to zero current.
- (4) Q<sub>rr</sub> area under curve defined by t<sub>rr</sub> and I<sub>RRM</sub>

$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

(5)  $di_{(rec)M}/dt$  - peak rate of change of current during t<sub>b</sub> portion of t<sub>rr</sub>



# **Ordering Information**

Device	Packing
Part Number-BP	Bulk:30pcs/Tube,360pcs/Box,1.8Kpcs/Carton

Note: Adding "-HF" Suffix For Halogen Free, eg. Part Number-BP-HF

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