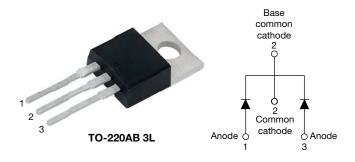


Ultrafast Rectifier, 2 x 8 A FRED Pt®



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS									
I _{F(AV)} 2 x 8 A									
V_{R}	200 V								
V _F at I _F	0.895 V								
t _{rr} typ.	See Recovery table								
T _J max.	175 °C								
Package	TO-220AB 3L								
Circuit configuration	Common cathode								

FEATURES

- Ultrafast recovery time
- Low forward voltage drop
- 175 °C operating junction temperature

Low leakage current



- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

DESCRIPTION / APPLICATIONS

VS-MUR1620CT-M3 is the state of the art ultrafast recovery rectifier specifically designed with optimized performance of forward voltage drop and ultrafast recovery time.

The planar structure and the platinum doped life time control, guarantee the best overall performance, ruggedness and reliability characteristics.

These devices are intended for use in the output rectification stage of SMPS, UPS, DC/DC converters as well as freewheeling diode in low voltage inverters and chopper motor drives.

Their extremely optimized stored charge and low recovery current minimize the switching losses and reduce over dissipation in the switching element and snubbers.

MECHANICAL DATA

Case: TO-220AB

Molding compound meets UL 94 V-0 flammability rating **Terminals:** matte tin plated leads, solderable per J-STD-002

ABSOLUTE MAXIMUM RATINGS										
PARAMETER		SYMBOL	TEST CONDITIONS	MAX.	UNITS					
Peak repetitive reverse voltage		V_{RRM}		200	V					
Average rectified forward current	per leg	I		8.0						
	total device	I _{F(AV)}	Rated V _R , T _C = 150 °C	16	Α					
Non-repetitive peak surge current per leg		I _{FSM}		100	^					
Peak repetitive forward current per	leg	I _{FM}	Rated V _R , square wave, 20 kHz, T _C = 150 °C	16						
Operating junction and storage tem	peratures	T _J , T _{Stg}		-65 to +175	°C					

ELECTRICAL SPECIFICATIONS (T _J = 25 °C unless otherwise specified)										
PARAMETER SYMBOL TEST CONDITIONS				TYP.	MAX.	UNITS				
Breakdown voltage, blocking voltage	V_{BR} , V_{R}	I _R = 100 μA	200	-	-	.,				
Forward voltage	V _F	I _F = 8 A	-	-	0.975	V				
		I _F = 8 A, T _J = 150 °C	-	-	0.895					
Deverage legicage everyont	and allerent	$V_R = V_R$ rated	-	-	5					
Reverse leakage current	I _R	$T_J = 150 ^{\circ}\text{C}, V_R = V_R \text{rated}$	-	-	250	μΑ				
Junction capacitance	C _T	V _R = 200 V	-	25	-	pF				
Series inductance	L _S	Measured lead to lead 5 mm from package body	-	8.0	-	nΗ				



DYNAMIC RECOVERY CHARACTERISTICS (T _J = 25 °C unless otherwise specified)										
PARAMETER	SYMBOL	TEST CO	MIN.	TYP.	MAX.	UNITS				
		$I_F = 1.0 \text{ A}, dI_F/dt =$	$I_F = 1.0 \text{ A}, dI_F/dt = 50 \text{ A/}\mu\text{s}, V_R = 30 \text{ V}$			35				
Reverse recovery time	t _{rr}	$I_F = 0.5 A, I_R = 1.0$	Ī	I	25	ns				
neverse recovery time		T _J = 25 °C		-	20	-	A nC			
		T _J = 125 °C		=	34	-				
Dook roopyon, gurrent	I _{RRM}	T _J = 25 °C	l _F = 8 A dl _F /dt = 200 A/μs	-	1.7	-				
Peak recovery current		T _J = 125 °C	V _R = 160 V	-	4.2	-				
Reverse recovery charge	Q _{rr}	T _J = 25 °C		=	23	-				
		T _J = 125 °C		=	75	-				

THERMAL MECHANICAL SPECIFICATIONS									
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS			
Maximum junction and storage temperature range	T _J , T _{Stg}		-65	-	175	°C			
Thermal resistance, junction to case per leg	R _{thJC}		-	-	3.0				
Thermal resistance, junction to ambient per leg	R _{thJA}		-	-	50	°C/W			
Thermal resistance, case to heatsink	R _{thCS}	Mounting surface, flat, smooth and greased	-	0.5	-				
Weight			-	2.0	-	g			
Mounting torque			6.0 (5.0)	-	12 (10)	kgf · cm (lbf · in)			
Marking device		Case style TO-220AB 3L	MUR1620CT						

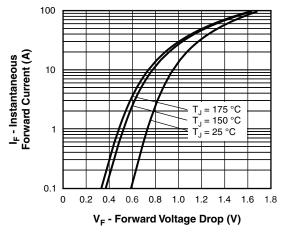


Fig. 1 - Typical Forward Voltage Drop Characteristics

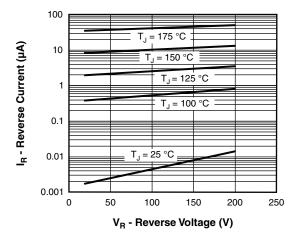


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

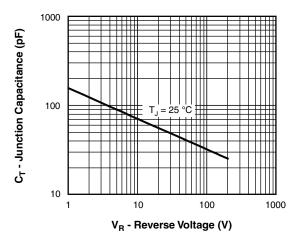


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

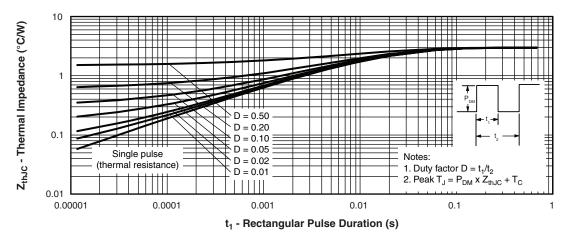


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

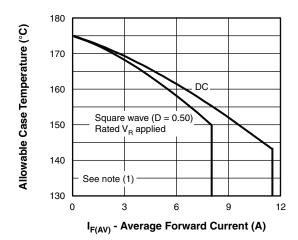


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

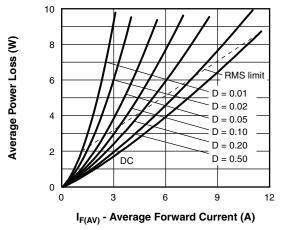


Fig. 6 - Forward Power Loss Characteristics

Note

 $\begin{array}{ll} \text{(1)} & \text{Formula used: } T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}; \\ Pd = \text{forward power loss} = I_{F(AV)} \times V_{FM} \text{ at } (I_{F(AV)}/D) \text{ (see fig. 6)}; \\ Pd_{REV} = \text{inverse power loss} = V_{R1} \times I_R \text{ (1 - D)}; I_R \text{ at } V_{R1} = \text{rated } V_R \\ \end{array}$

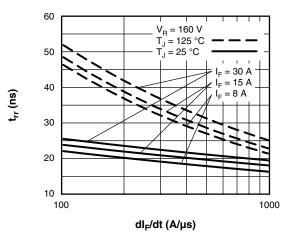


Fig. 7 - Typical Reverse Recovery Time vs. dl_F/dt

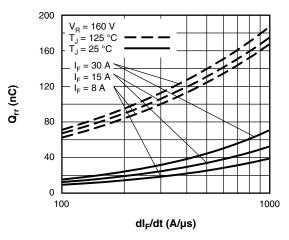
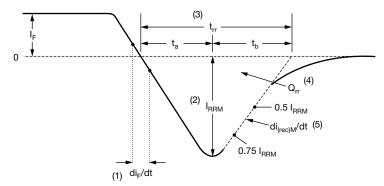


Fig. 8 - Typical Stored Charge vs. dl_F/dt



- (1) di_F/dt rate of change of current through zero crossing
- (2) I_{RRM} peak reverse recovery current
- (3) $\rm t_{rr}$ reverse recovery time measured from zero crossing point of negative going $\rm I_F$ to point where a line passing through 0.75 $\rm I_{RRM}$ and 0.50 $\rm I_{RRM}$ extrapolated to zero current.
- (4) \mathbf{Q}_{rr} area under curve defined by \mathbf{t}_{rr} and \mathbf{I}_{RRM}

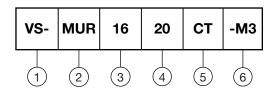
$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

(5) di_{(rec)M}/dt - peak rate of change of current during t_b portion of t_{rr}

Fig. 9 - Reverse Recovery Waveform and Definitions

ORDERING INFORMATION TABLE

Device code



1 - Vishay Semiconductors product

2 - Ultrafast MUR series

Current rating (16 = 16 A)

Voltage rating (20 = 200 V)

5 - CT = center tap (dual)

6 - Environmental digit:

-M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free

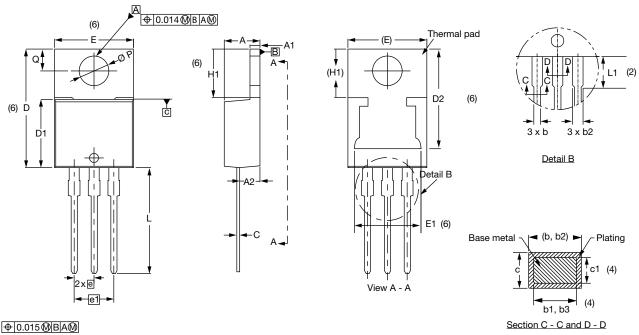
ORDERING INFORMATION (Example)								
PREFERRED P/N	BASE QUANTITY	PACKAGING DESCRIPTION						
VS-MUR1620CT-M3	50	Antistatic plastic tubes						

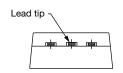
LINKS TO RELATED DOCUMENTS								
Dimensions	www.vishay.com/doc?96154							
Part marking information	www.vishay.com/doc?95028							
SPICE model	www.vishay.com/doc?96995							



TO-220AB 3L

DIMENSIONS in millimeters and inches





Conforms to JEDEC® outline TO-220AB

SYMBOL	MILLIMETERS		INCHES		NOTES	SYMBOL	MILLIMETERS		INCHES		NOTES	
STMBOL	MIN.	MAX.	MIN.	MAX.	NOTES	NOTES	STIVIBOL	MIN.	MAX.	MIN.	MAX.	NOTES
Α	4.25	4.65	0.167	0.183			D2	11.68	13.30	0.460	0.524	6, 7
A1	1.14	1.40	0.045	0.055			Е	10.11	10.51	0.398	0.414	3, 6
A2	2.50	2.92	0.098	0.115			E1	6.86	8.89	0.270	0.350	6
b	0.69	1.01	0.027	0.040			е	2.41	2.67	0.095	0.105	
b1	0.38	0.97	0.015	0.038	4		e1	4.88	5.28	0.192	0.208	
b2	1.20	1.73	0.047	0.068			H1	6.09	6.48	0.240	0.255	6
b3	1.14	1.73	0.045	0.068	4		L	13.52	14.02	0.532	0.552	
С	0.36	0.61	0.014	0.024			L1	3.32	3.82	0.131	0.150	2
c1	0.36	0.56	0.014	0.022	4		ØΡ	3.54	3.91	0.139	0.154	
D	14.85	15.35	0.585	0.604	3		Q	2.60	3.00	0.102	0.118	
D1	8.38	9.02	0.330	0.355								

Notes

- ⁽¹⁾ Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Lead dimension and finish uncontrolled in L1
- (3) Dimension D, D1, and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
- (4) Dimension b1, b3, and c1 apply to base metal only
- Controlling dimensions: inches
- (6) Thermal pad contour optional within dimensions E, H1, D2, and E1
- (7) Outline conforms to JEDEC® TO-220, except D2



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