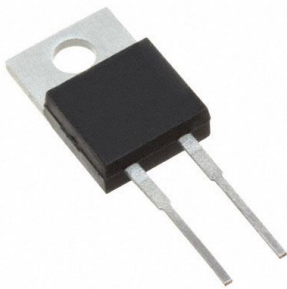


VS-8ETU04-M3 Datasheet

www.digi-electronics.com



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	VS-8ETU04-M3-DG
Manufacturer	Vishay General Semiconductor - Diodes Division
Manufacturer Product Number	VS-8ETU04-M3
Description	DIODE GEN PURP 400V 8A TO220AC
Detailed Description	Diode 400 V 8A Through Hole TO-220AC

This model VS-8ETU04-M3 is available at DiGi Electronics.

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Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:

VS-8ETU04-M3

Series:

FRED Pt®

Technology:

Standard

Current - Average Rectified (Io):

8A

Speed:

Fast Recovery =< 500ns, > 200mA (Io)

Current - Reverse Leakage @ Vr:

10 µA @ 400 V

Mounting Type:

Through Hole

Supplier Device Package:

TO-220AC

Base Product Number:

8ETU04

Manufacturer:

Vishay General Semiconductor - Diodes Division

Product Status:

Active

Voltage - DC Reverse (Vr) (Max):

400 V

Voltage - Forward (Vf) (Max) @ If:

1.3 V @ 8 A

Reverse Recovery Time (trr):

60 ns

Capacitance @ Vr, F:

-

Package / Case:

TO-220-2

Operating Temperature - Junction:

-65°C ~ 175°C

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.10.0080

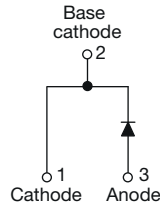
Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

Ultrafast Rectifier, 8 A FRED Pt[®]


TO-220AC 2L


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 www.vishay.com/doc?99912


RoHS
 COMPLIANT
 HALOGEN
FREE

DESCRIPTION / APPLICATIONS

FRED Pt[®] series are the state of the art ultrafast recovery rectifiers 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.

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	8 A
V_R	400 V
V_F at I_F	0.94 V
t_{rr} typ.	See Recovery table
T_J max.	175 °C
Package	TO-220AC 2L
Circuit configuration	Single

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Repetitive peak reverse voltage	V_{RRM}		400	V
Average rectified forward current	$I_{F(AV)}$	$T_C = 155\text{ °C}$	8	A
Non-repetitive peak surge current	I_{FSM}	$T_C = 25\text{ °C}$	100	
Repetitive peak forward current	I_{FRM}		16	
Operating junction and storage temperatures	T_J, T_{Stg}		-65 to +175	°C

ELECTRICAL SPECIFICATIONS ($T_J = 25\text{ °C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	V_{BR}, V_R	$I_R = 100\text{ }\mu\text{A}$	400	-	-	V
Forward voltage	V_F	$I_F = 8\text{ A}$	-	1.19	1.3	
		$I_F = 8\text{ A}, T_J = 150\text{ °C}$	-	0.94	1.0	
Reverse leakage current	I_R	$V_R = V_R$ rated	-	0.2	10	μA
		$T_J = 150\text{ °C}, V_R = V_R$ rated	-	20	500	
Junction capacitance	C_T	$V_R = 400\text{ V}$	-	14	-	pF
Series inductance	L_S	Measured lead to lead 5 mm from package body	-	8.0	-	nH



DYNAMIC RECOVERY CHARACTERISTICS (T _J = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t _{rr}	I _F = 1.0 A, di _F /dt = 50 A/μA, V _R = 30 V	-	35	60	ns
		T _J = 25 °C	-	43	-	
		T _J = 125 °C	-	67	-	
Peak recovery current	I _{RRM}	T _J = 25 °C	-	2.8	-	A
		T _J = 125 °C	-	6.3	-	
		I _F = 8 A di _F /dt = 200 A/μs V _R = 200 V	-	60	-	
Reverse recovery charge	Q _{rr}	T _J = 25 °C	-	60	-	nC
		T _J = 125 °C	-	210	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Thermal resistance, junction to case	R _{thJC}		-	1.8	2	°C/W
Thermal resistance, junction to ambient	R _{thJA}	Typical socket mount	-	-	50	
Thermal resistance, case to heatsink	R _{thCS}	Mounting surface, flat, smooth, and greased	-	0.5	-	
Weight			-	2.0	-	g
			-	0.07	-	oz.
Mounting torque			6.0 (5.0)	-	12 (10)	kgf · cm (lbf · in)
Marking device		Case style TO-220AC 2L	8ETU04			

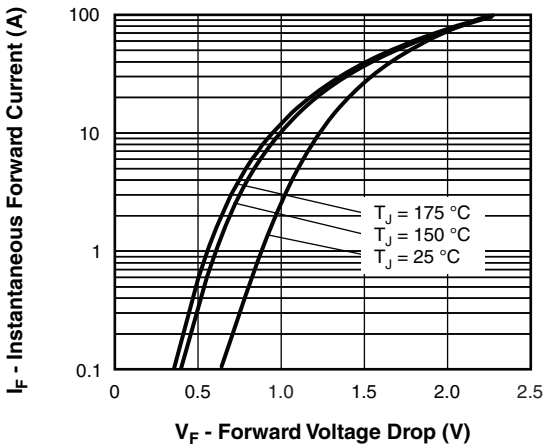


Fig. 1 - Typical Forward Voltage Drop Characteristics

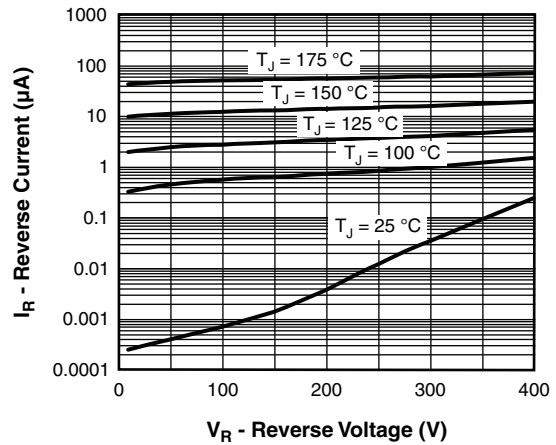


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

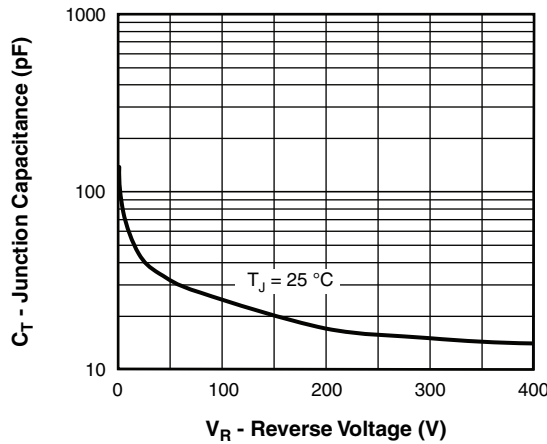


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

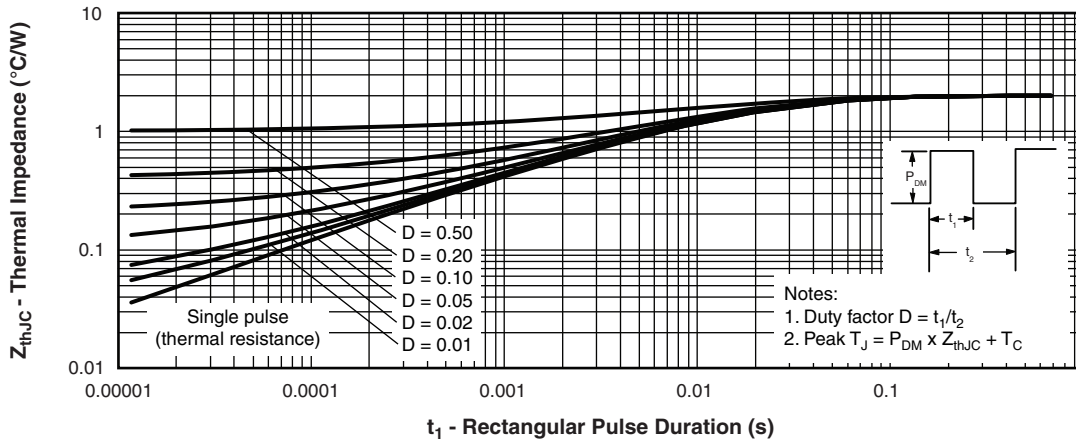


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

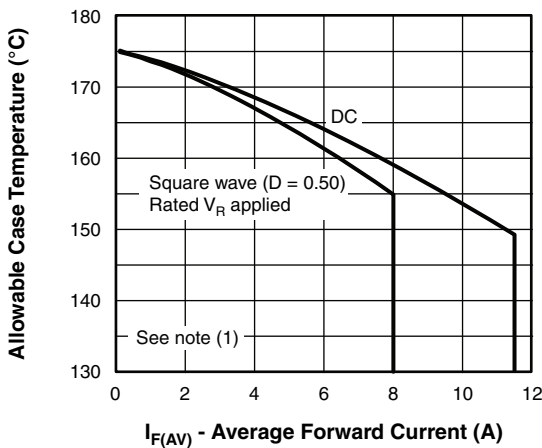


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

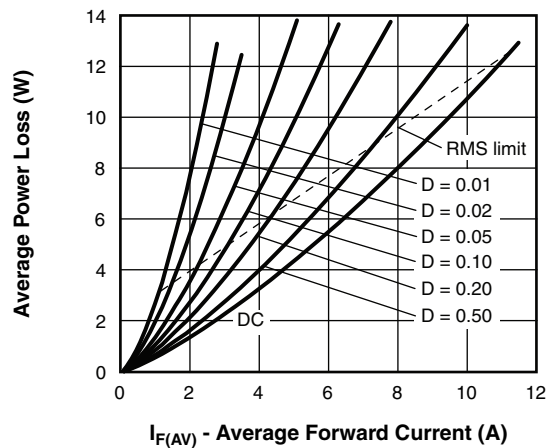


Fig. 6 - Forward Power Loss Characteristics

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
 P_d = forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 P_{dREV} = inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = rated V_R

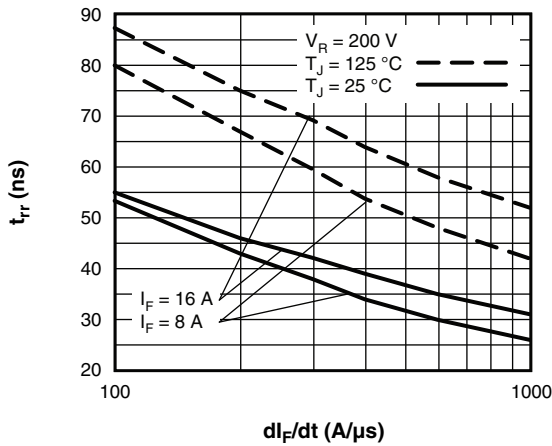


Fig. 7 - Typical Reverse Recovery Time vs. di_F/dt

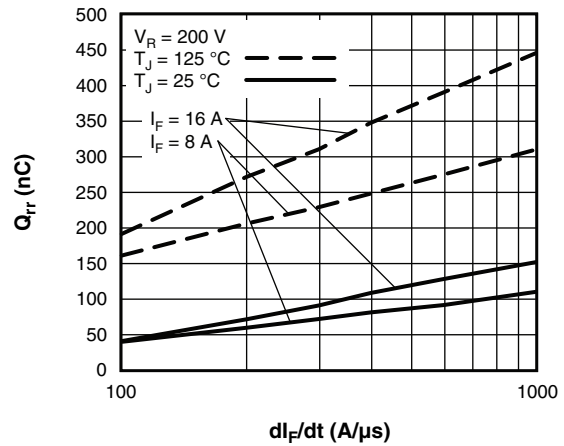


Fig. 8 - Typical Stored Charge vs. di_F/dt

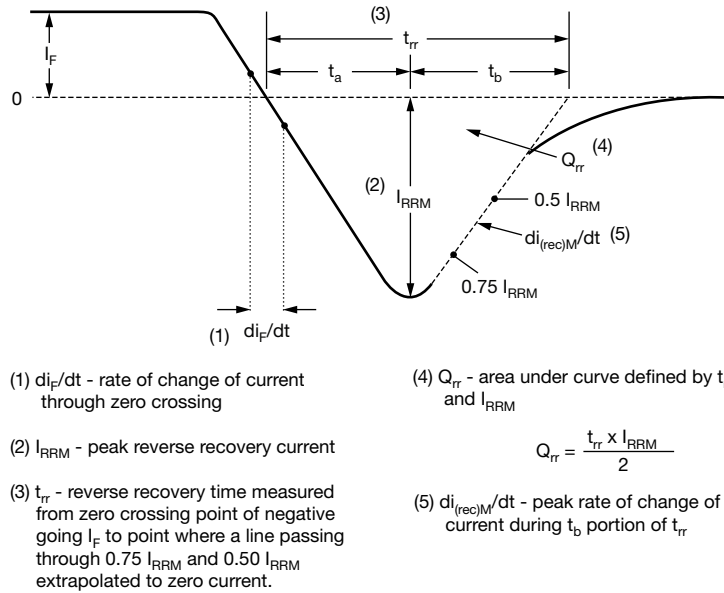
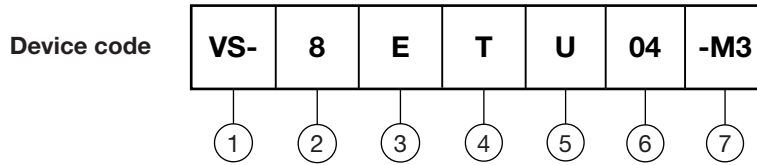


Fig. 9 - Reverse Recovery Waveform and Definitions



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating (8 = 8 A)
- 3** - E = single
- 4** - Package:
T = 2L TO-220AC
- 5** - U = ultrafast recovery
- 6** - Voltage rating (04 = 400 V)
- 7** - Environmental digit:
-M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free

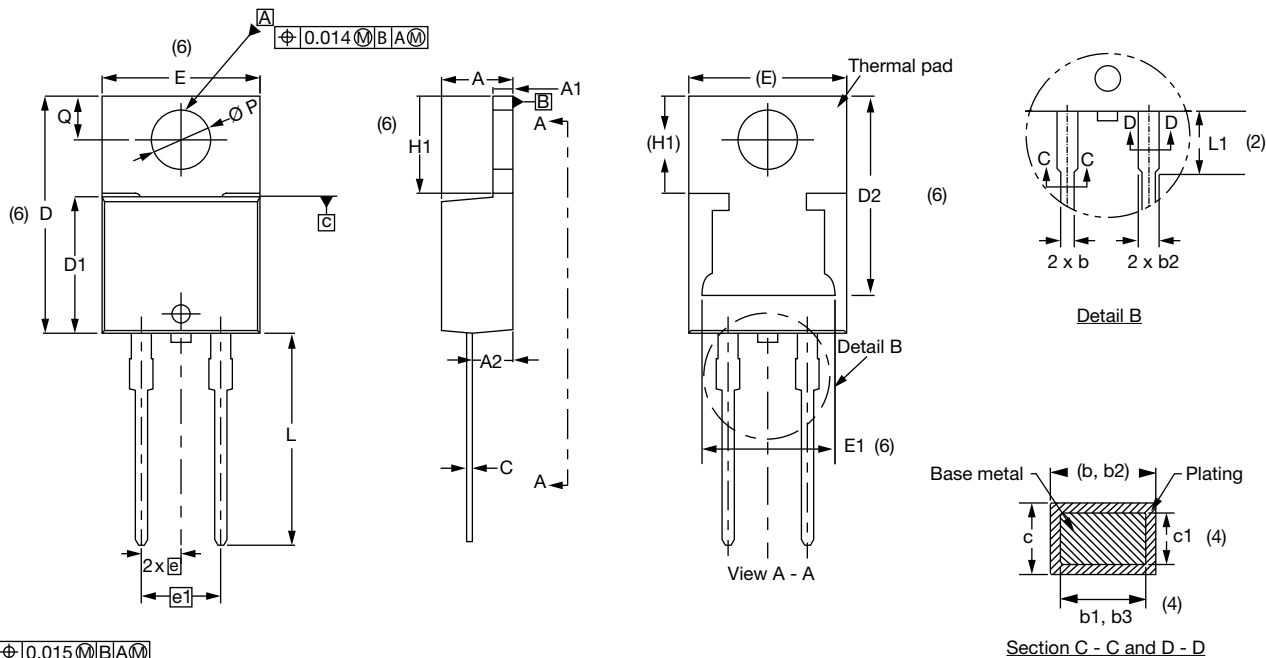
ORDERING INFORMATION (Example)		
PREFERRED P/N	BASE QUANTITY	PACKAGING DESCRIPTION
VS-8ETU04-M3	50	Antistatic plastic tubes

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?96156
Part marking information	www.vishay.com/doc?95391
SPICE model	www.vishay.com/doc?95441



TO-220AC 2L

DIMENSIONS in millimeters and inches



Conforms to JEDEC® outline TO-220AC

SYMBOL	MILLIMETERS		INCHES		NOTES	SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.			MIN.	MAX.	MIN.	MAX.	
A	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		E	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		e	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	
c	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	∅ P	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
- (5) 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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