

Power Rectifier Diodes (T-Modules), 2200 V, 20 A



D-55 (T-module)

FEATURES

- Electrically isolated base plate
- 2200 V_{RRM}
- Industrial standard packaging
- UL approved file E78996 
- Simplified mechanical designs, rapid assembly
- Large creepage distances
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

PRIMARY CHARACTERISTICS

I _{F(AV)}	20 A
Type	Modules - diode, high voltage
V _{RRM}	2200 V
Package	D-55 (T-module)
Circuit configuration	Single diode

DESCRIPTION / APPLICATIONS

These series of D-55 (T-modules) use standard recovery power rectifier diodes. The semiconductors are electrically isolated from the metal base, allowing common heatsink and compact assembly to be built.

Applications include power supplies, battery charges, welders, motor controls, and solar panel application.

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
I _{F(AV)}		20	A
	T _C	85	°C
I _{F(RMS)}		31	A
I _{FSM}	50 Hz	450	
	60 Hz	470	
I ² t	50 Hz	1015	A ² s
	60 Hz	920	
I ² √t		10 125	A ² √s
V _{RRM}		2200	V
T _J		-40 to +150	°C

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS

TYPE NUMBER	VOLTAGE CODE	V _{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V _{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I _{RRM} MAXIMUM AT T _J = 150 °C mA
VS-T20HF220	22	2200	2250	18

**FORWARD CONDUCTION**

PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS		
Maximum average forward current at case temperature	I _{F(AV)}	180° conduction, half sine wave			20	A		
					85	°C		
Maximum RMS forward current	I _{F(RMS)}				31	A		
Maximum peak, one-cycle forward, non-repetitive surge current	I _{FSM}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial T _J = T _J maximum	450	A		
		t = 8.3 ms			470			
		t = 10 ms	100 % V _{RRM} reapplied		380		A ² s	
		t = 8.3 ms			400			
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied		1015			
		t = 8.3 ms			920			
		t = 10 ms	100 % V _{RRM} reapplied		715		A ² √s	
		t = 8.3 ms			650			
Maximum I ² √t for fusing	I ² √t	t = 0.1 ms to 10 ms, no voltage reapplied			10 125	A ² √s		
Low level value of threshold voltage	V _{F(TO)1}	(16.7 % × π × I _{F(AV)}) < I < π × I _{F(AV)} , T _J maximum			0.77	V		
High level value of threshold voltage	V _{F(TO)2}	(I > π × I _{F(AV)}), T _J maximum			0.89			
Low level value of forward slope resistance	r _{f1}	(16.7 % × π × I _{F(AV)}) < I < π × I _{F(AV)} , T _J maximum			8.5	mΩ		
High level value of forward slope resistance	r _{f2}	(I > π × I _{F(AV)}), T _J maximum			6.7			
Maximum forward voltage drop	V _{FM}	I _{FM} = 60 A, T _J = 25 °C, t _p = 400 μs square pulse Average power = V _{F(TO)} × I _{F(AV)} + r _f × (I _{F(RMS)}) ²			1.50	V		

BLOCKING

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum peak reverse leakage current	I_{RRM}	$T_J = 150\text{ °C}$	18	mA
RMS isolation voltage	V_{ISOL}	50 Hz, circuit to base, all terminals shorted $T_J = 25\text{ °C}$, $t = 1\text{ s}$	3500	V

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction operating and storage temperature range	T_J, T_{Stg}			-40 to +150	°C
Maximum thermal resistance, junction to case per junction	R_{thJC}	DC operation		2.53	K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface smooth, flat and greased		0.2	
Mounting torque, $\pm 10\%$ to heatsink terminals		Non-lubricated threads	M3.5 mounting screws ⁽¹⁾	$1.3 \pm 10\%$	Nm
			M5 screw terminals	$3 \pm 10\%$	
Approximate weight		See dimensions - link at the end of datasheet		54	g
Case style				D-55 (T-module)	

Note

- ⁽¹⁾ A mounting compound is recommended and the torque should be rechecked after a period of about 3 hours to allow for the spread of the compound

ΔR CONDUCTION PER JUNCTION

DEVICES	SINUSOIDAL CONDUCTION AT $T_J\text{ MAXIMUM}$					RECTANGULAR CONDUCTION AT $T_J\text{ MAXIMUM}$					UNITS
	180°	120°	90°	60°	30°	180°	120°	90°	60°	30°	
T20HF...	0.29	0.34	0.43	0.64	1.10	0.20	0.35	0.47	0.67	1.11	K/W

Note

- Table shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

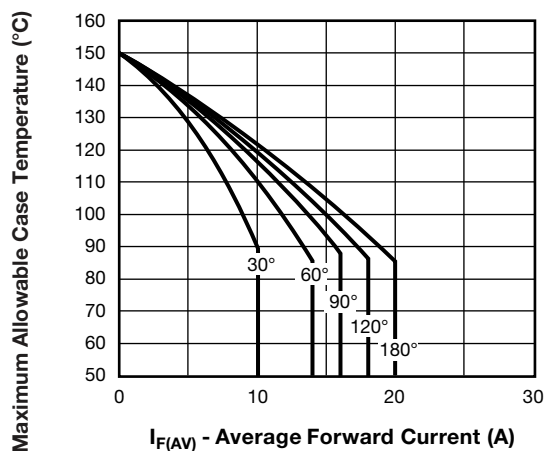


Fig. 1 - Current Ratings Characteristics

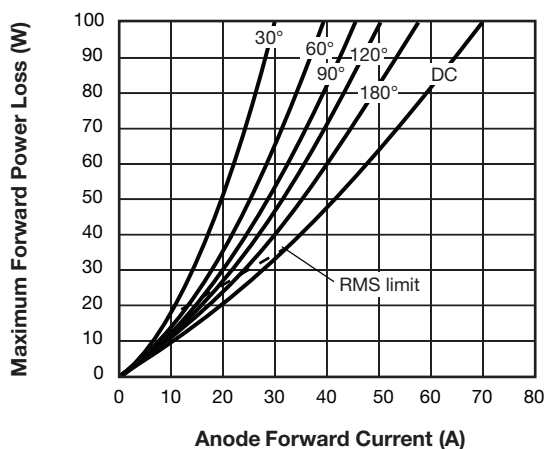


Fig. 4 - Forward Power Loss Characteristics

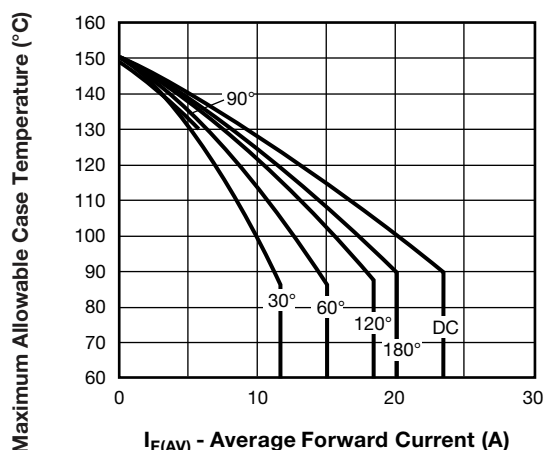


Fig. 2 - Current Ratings Characteristics

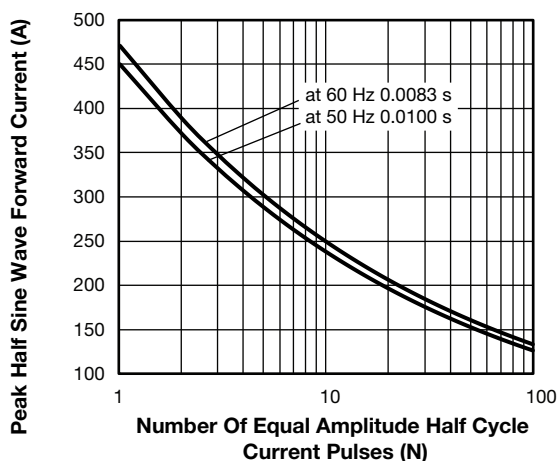


Fig. 5 - Maximum Non-Repetitive Surge Current

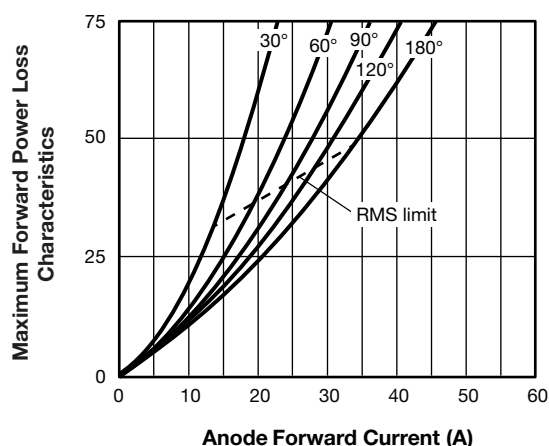


Fig. 3 - Forward Power Loss Characteristics

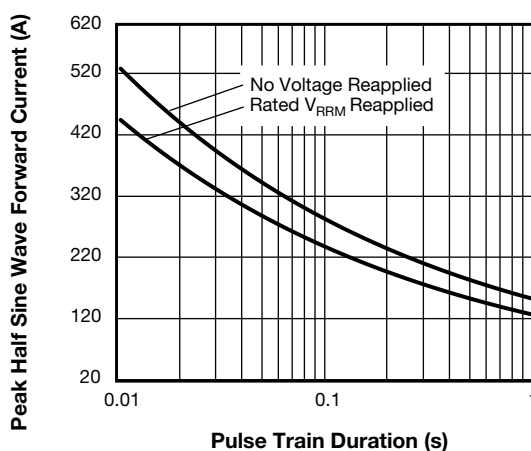


Fig. 6 - Maximum Non-Repetitive Surge Current

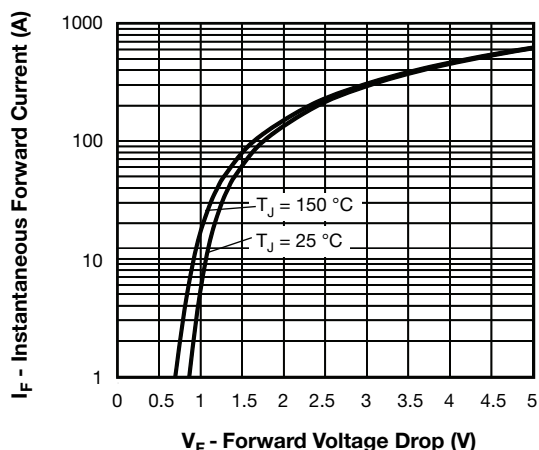


Fig. 7 - Forward Voltage Drop Characteristics

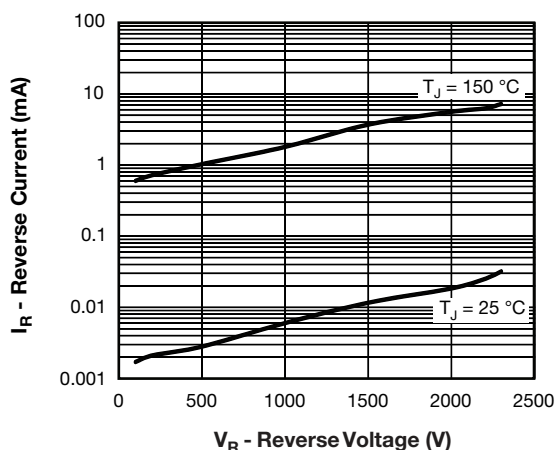
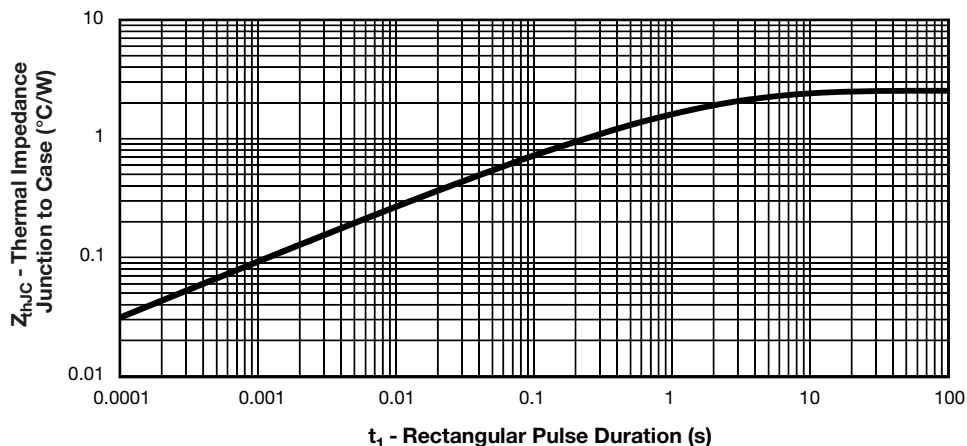


Fig. 8 - Typical Values of Reverse Current vs. Reverse Voltage


Fig. 9 - Maximum Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code	VS-	T	20	HF	220
	①	②	③	④	⑤
①	-	Vishay Semiconductors product			
②	-	Module type			
③	-	Current rating			
④	-	Circuit configuration (see Circuit Configuration table)			
⑤	-	Voltage code x 10 = V_{RRM}			

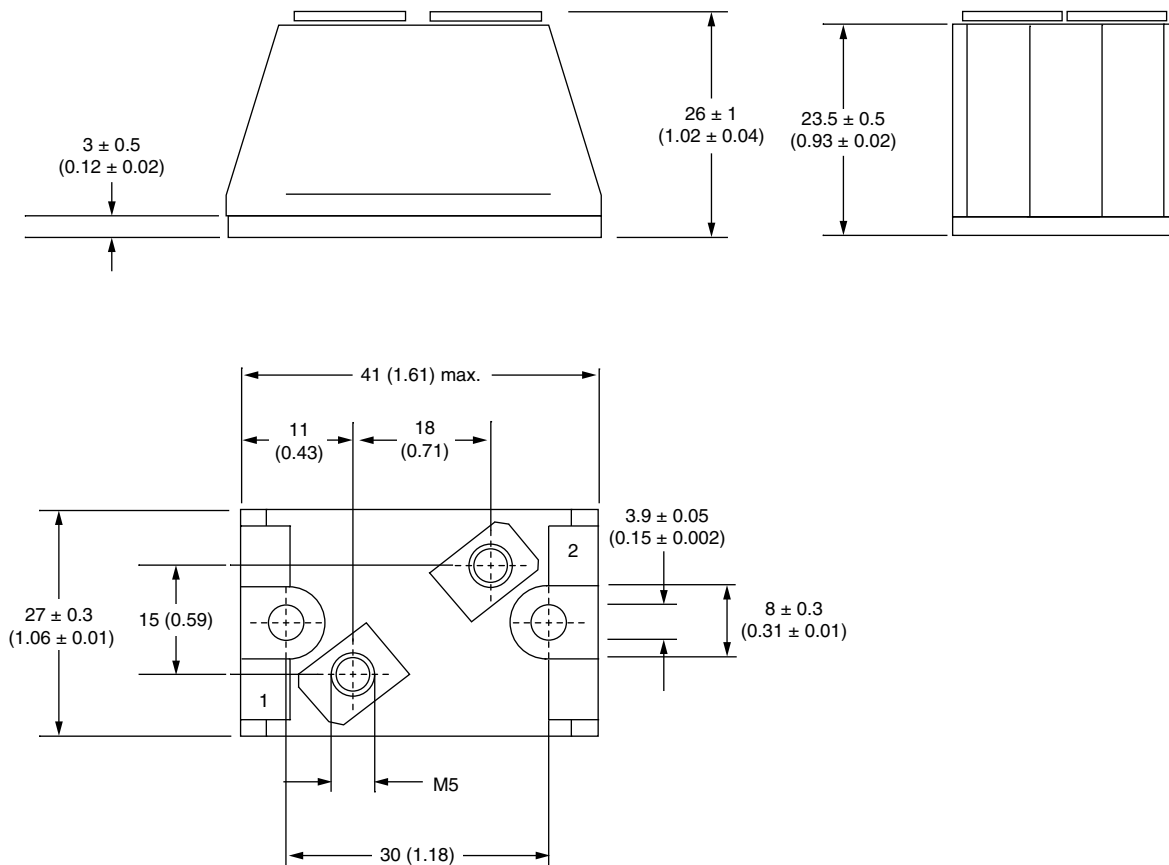
CIRCUIT CONFIGURATION		
CIRCUIT DESCRIPTION	CIRCUIT CONFIGURATION CODE	CIRCUIT DRAWING
Single diode	HF	

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95313



D-55 T-Module Diode Standard and Fast Recovery

DIMENSIONS in millimeters (inches)



Note

- 1 = Anode
- 2 = Cathode



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.