International **IꬱR** Rectifier

STPS40L15CT

SCHOTTKY RECTIFIER

2 x 20 Amps

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	15	V
I_{FSM} @ tp = 5 µs sine	700	A
V_F @ 19 Apk, T_J=125°C (per leg, Typical)	0.25	V
T_J	-55 to 125	°C

Description/Features

The center tap Schottky rectifier module has been optimized for ultra low forward voltage drop specifically for the OR-ing of parallel power supplies. The proprietary barrier technology allows for reliable operation up to 125 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

- 125°C T_J operation (V_R < 5V)
- Center tap module
- Optimized for OR-ing applications
- Ultra low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance

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Case Styles

STPS40L15CT

TO-220AB

STPS40L15CT

International
IOR Rectifier
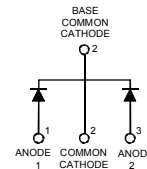
Voltage Ratings

Part number			Values
V_R	Max. DC Reverse Voltage (V)	@ T_J = 100 °C	15
V_{RWM}	Max. Working Peak Reverse Voltage (V)	@ T_J = 100 °C	

Absolute Maximum Ratings

	Parameters	Values	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward (Per Leg) Current *See Fig. 5 (Per Device)	20 / 40	A	50% duty cycle @ T_C = 85°C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) *See Fig. 7	700 / 330	A	5µs Sine or 3µs Rect. pulse / 10ms Sine or 6ms Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	10	mJ	T_J = 25 °C, I_{AS} = 2 Amps, L = 6 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)	2	A	Current decaying linearly to zero in 1 µsec Frequency limited by T_J max. V_A = 1.5 x V_R typical	

Electrical Specifications

	Parameters	Typ.	Max.	Units	Conditions	
V_{FM}	Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	-	0.41	V	@ 19A	T_J = 25 °C
		-	0.52	V	@ 40A	
		0.25	0.33	V	@ 19A	T_J = 125 °C
		0.37	0.50	V	@ 40A	
I_{RM}	Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	-	10	mA	T_J = 25 °C	V_R = rated V_R
		-	600	mA	T_J = 100 °C	
$V_{F(TO)}$	Threshold Voltage	0.182		V	T_J = T_J max.	
r_t	Forward Slope Resistance	7.6		mΩ		
C_T	Max. Junction Capacitance (Per Leg)	-	2000	pF	V_R = 5V_{DC}, (test signal range 100Khz to 1Mhz) 25°C	
L_S	Typical Series Inductance (Per Leg)	8	-	nH	Measured lead to lead 5mm from package body	
dv/dt	Max. Voltage Rate of Change (Rated V_R)	10000		V/ µs		

(1) Pulse Width < 300µs, Duty Cycle <2%

Thermal-Mechanical Specifications

|	Parameters		Values	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 125	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 150	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)		1.5	°C/W	DC operation *See Fig. 4
R_{thCS}	Typical Thermal Resistance Case to Heatsink		0.50	°C/W	Mounting surface, smooth and greased Only for TO-220
R_{thJA}	Max. Thermal Resistance Junction to Ambient		40	°C/W	DC operation For D²Pak and TO-262
wt	Approximate Weight		2(0.07)	g(oz.)	
T	Mounting Torque	Min.	6(5)	Kg-cm (lbf-in)	Non-lubricated threads
		Max.	12(10)		
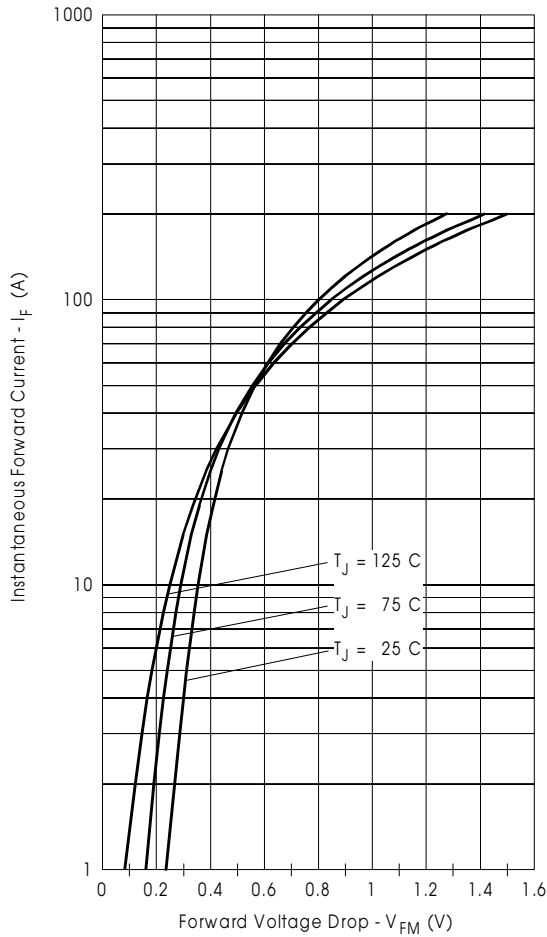
Fig. 1 - Maximum Forward Voltage Drop Characteristics
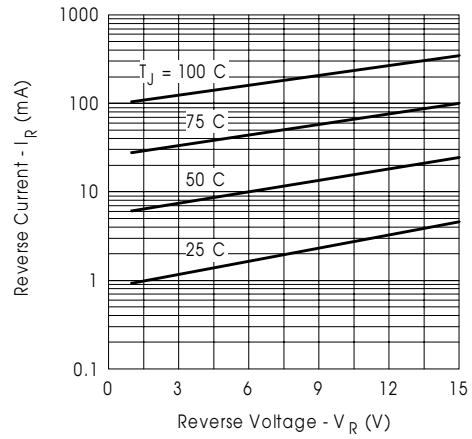
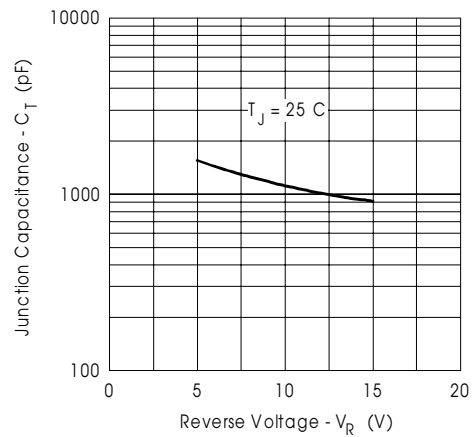Fig. 2 - Typical Values of Reverse Current
Vs. Reverse Voltage

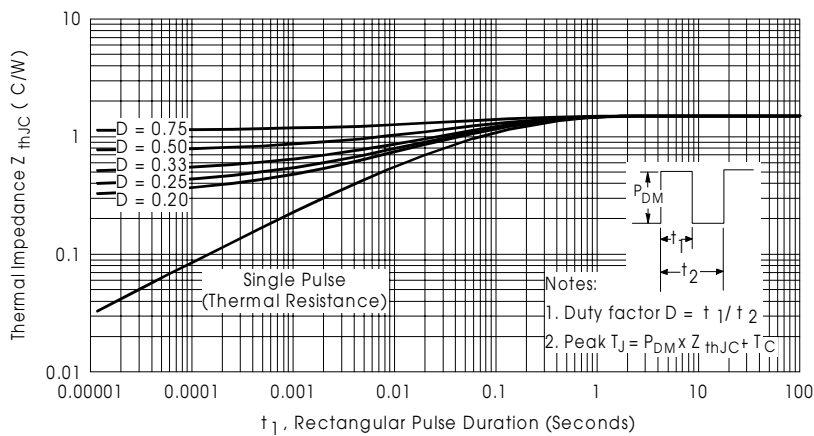Fig. 3 - Typical Junction Capacitance
Vs. Reverse Voltage

Notes:

1. Duty factor $D = t_1 / t_2$

2. Peak $T_J = P_{DM} \times Z_{thJC} + T_C$

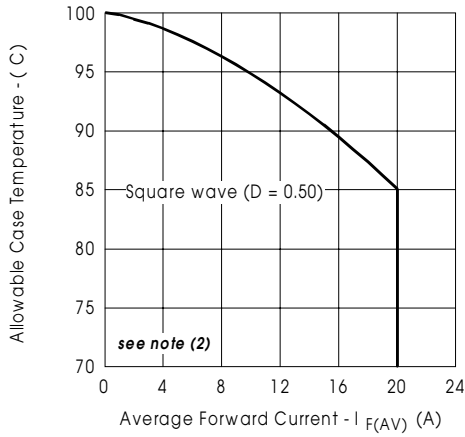Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

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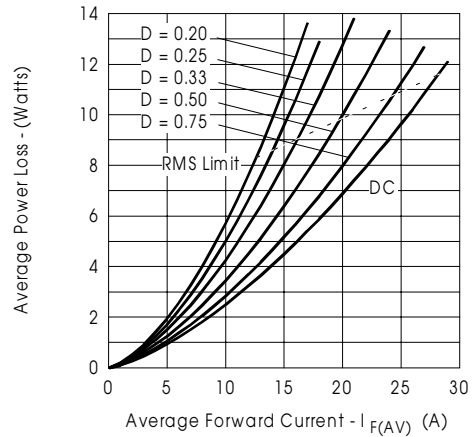Vs. Average Forward Current

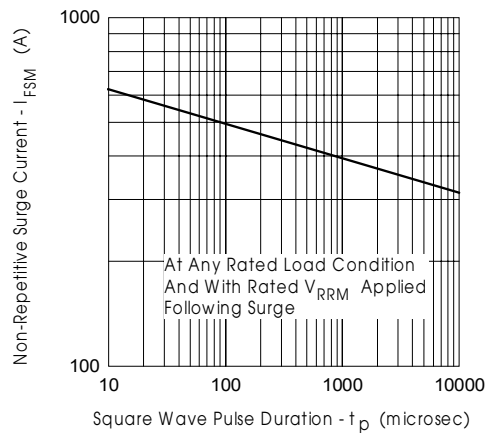Fig. 6 - Forward Power Loss Characteristics
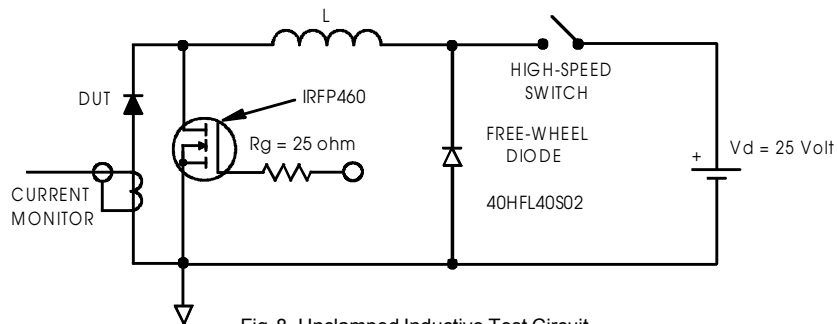

Fig. 7 - Maximum Non-Repetitive Surge Current

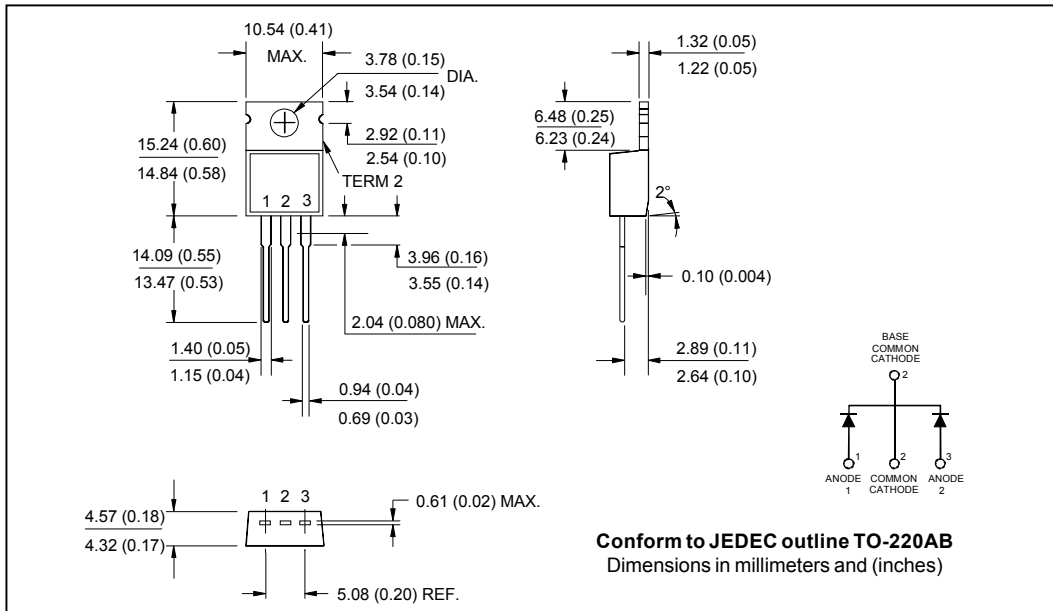Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;

Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM}$ @ ($I_{F(AV)}$ / D) (see Fig. 6);

Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R$ (1 - D); I_R @ V_{R1} = 80% rated V_R

Outline Table

10.54 (0.41) MAX.

3.78 (0.15) DIA.
3.54 (0.14)

2.92 (0.11)
2.54 (0.10)
TERM 2

15.24 (0.60)
14.84 (0.58)

14.09 (0.55)
13.47 (0.53)

3.96 (0.16)
3.55 (0.14)

2.04 (0.080) MAX.

1 2 3

1.40 (0.05)
1.15 (0.04)

0.94 (0.04)
0.69 (0.03)

1.32 (0.05)
1.22 (0.05)

6.48 (0.25)
6.23 (0.24)

2°

0.10 (0.004)

2.89 (0.11)
2.64 (0.10)

4.57 (0.18)
4.32 (0.17)

1 2 3

0.61 (0.02) MAX.

5.08 (0.20) REF.

BASE
COMMON
CATHODE
2

ANODE 1
COMMON CATHODE 2
ANODE 2

Conform to JEDEC outline TO-220AB
Dimensions in millimeters and (inches)

International
IƏR Rectifier