International
IOR Rectifier

10WQ045FN

SCHOTTKY RECTIFIER

10 Amp

D-Pak (TO-252AA)

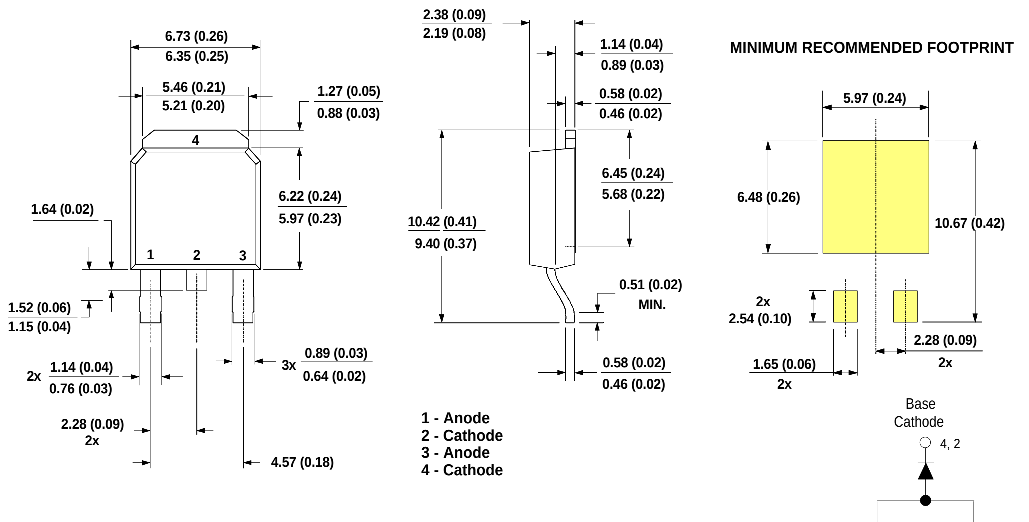
Major Ratings and Characteristics

Characteristics	10WQ045FN	Units
$I_{F(AV)}$ Rectangular waveform	10	A
V_{RRM}	45	V
I_{FSM} @ tp = 5 μs sine	400	A
V_F @ 10 Apk, T_J = 125°C	0.53	V
T_J range	- 40 to 175	°C

Description/ Features

The 10WQ045FN surface mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

- Popular D-PAK outline
- Small foot print, surface moutable
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



Conform to JEDEC outline D-Pak (Similar to TO-252AA)
Dimensions in millimeters and (inches)

Voltage Ratings

Part number	10WQ045FN
V_R Max. DC Reverse Voltage (V)	45
V_{RWM} Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

	Parameters	10WQ...	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current * See Fig. 5	10	A	50% duty cycle @ T_C = 157°C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repet.	400	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current * See Fig. 7	75		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	20	mJ	T_J = 25 °C, I_{AS} = 3.0 Amps, L = 4.40 mH	
I_{AR}	Repetitive Avalanche Current	3.0	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	10WQ...	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop	0.630	V	@ 10A	T_J = 25 °C
	* See Fig. 1 (1)	0.800	V	@ 20A	
		0.530	V	@ 10A	T_J = 125 °C
		0.710	V	@ 20A	
I_{RM}	Max. Reverse Leakage Current	1	mA	T_J = 25 °C	V_R = rated V_R
	* See Fig. 2 (1)	15	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.255	V	T_J = T_J max.	
r_t	Forward Slope Resistance	22	mΩ		
C_T	Typical Junction Capacitance	760	pF	V_R = 5V_{DC} (test signal range 100Khz to 1Mhz) 25 °C	
L_S	Typical Series Inductance	5.0	nH	Measured lead to lead 5mm from package body	

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

Thermal-Mechanical Specifications

	Parameters	10WQ...	Units	Conditions
T_J	Max. Junction Temp. Range (*)	- 40 to 175	°C	
T_{stg}	Max. Storage Temperature Range	- 40 to 175	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case	2.0	°C/W	DC operation * See Fig. 4
R_{thJA}	Max. Thermal Resistance Junction to Ambient	50	°C/W	
wt	Approximate Weight	0.3 (0.01)	g (oz.)	
	Case Style	D - PAK		Similar to TO-252AA

(*) $\frac{dPtot}{dTj} < \frac{1}{Rth(j\text{-}a)}$ thermal runaway condition for a diode on its own heatsink

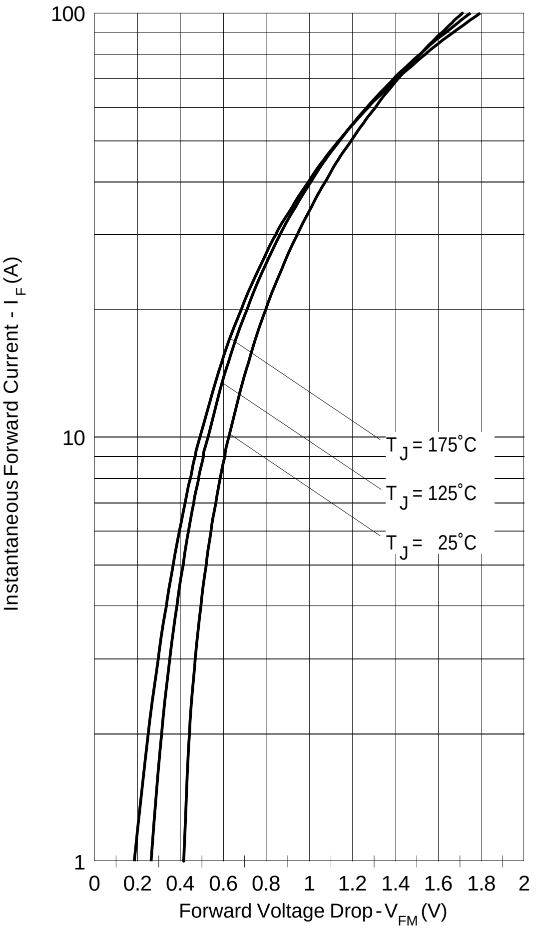


Fig. 1 - Maximum Forward Voltage Drop Characteristics

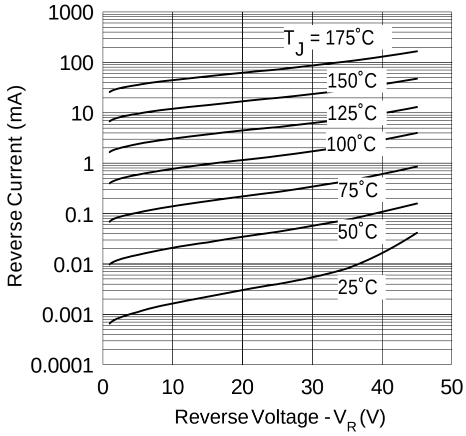


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

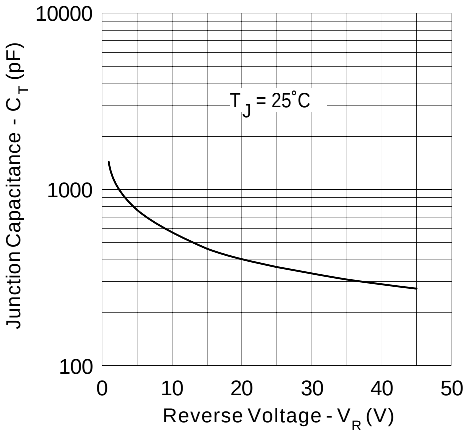


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

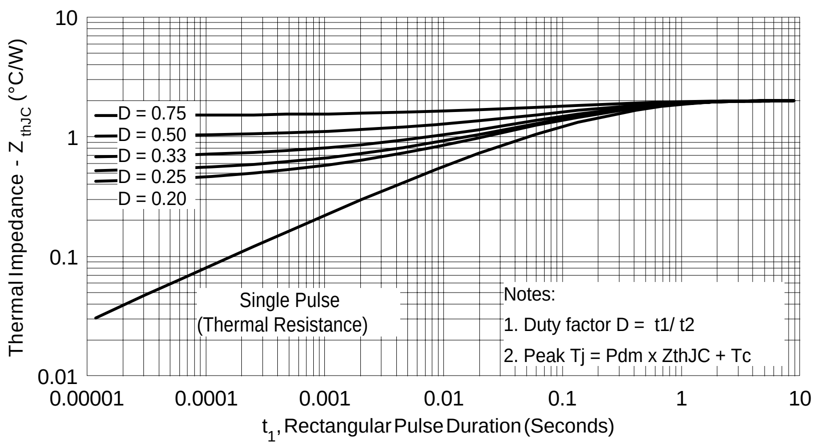


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

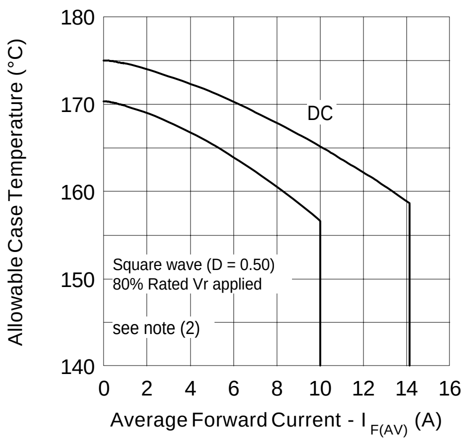


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

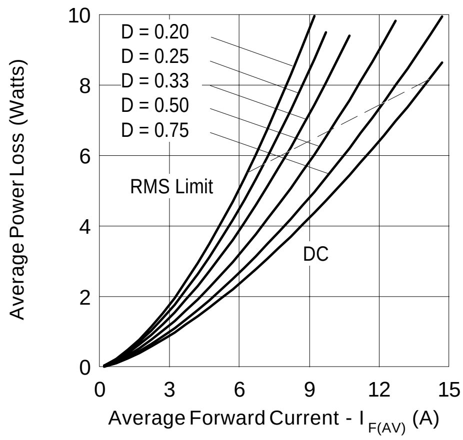


Fig. 6 - Forward Power Loss Characteristics

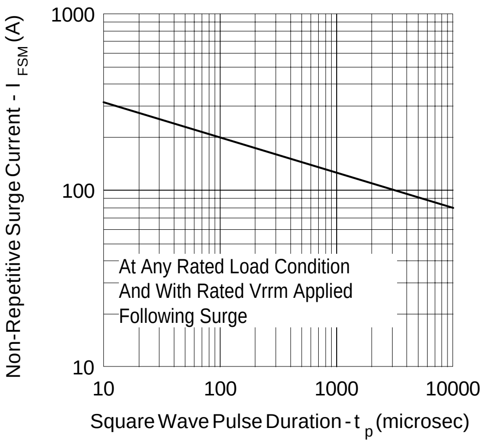
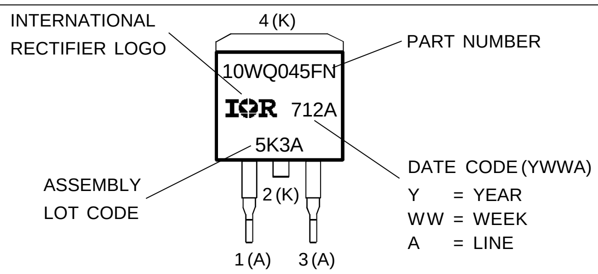


Fig. 7 - Maximum Non-Repetitive Surge Current

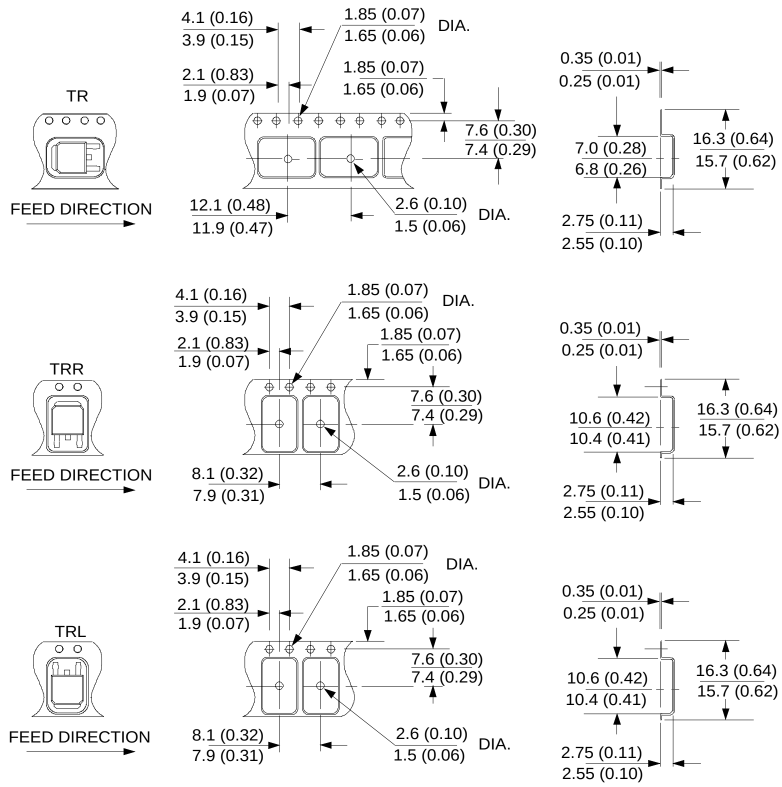
(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM}$ @ $(I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; I_R @ V_{R1} = 80% rated V_R

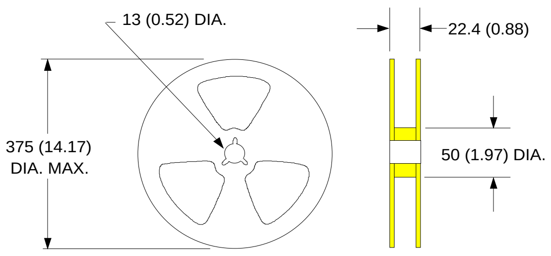
Marking Information

EXAMPLE: THIS IS AN 10WQ045FN



Tape & Reel Information





TO-252AA Tape & Reel

When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 2,000 pieces per reel for TR and multiples of 3,000 pieces per reel for both TRL and TRR.

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