

International IR Rectifier

50WQ10FN

SCHOTTKY RECTIFIER

5.5 Amp

$$I_{F(AV)} = 5.5\text{Amp}$$

$$V_R = 100\text{V}$$

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	5.5	A
V_{RRM}	100	V
I_{FSM} @tp = 5 μ s sine	330	A
V_F @5 Apk, $T_J = 125^\circ\text{C}$	0.63	V
T_J range	-40 to 150	$^\circ\text{C}$

Description/ Features

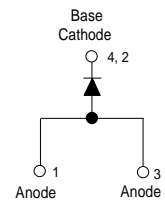
The 50WQ10FN surface mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

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

Case Styles



D-PAK (TO-252AA)



Voltage Ratings

Part number	50WQ10FN
V_R Max. DC Reverse Voltage (V)	100
V_{RWM} Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	50WQ...	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	5.5	A	50% duty cycle @ $T_C = 135^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	330	A	5 μs Sine or 3 μs Rect. pulse
	110		10ms Sine or 6ms Rect. pulse
E_{AS} Non-Repetitive Avalanche Energy	6.0	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 0.5$ Amps, $L = 40$ mH
I_{AR} Repetitive Avalanche Current	0.5	A	Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	50WQ...	Units	Conditions
V_{FM} Max. Forward Voltage Drop * See Fig. 1 (1)	0.77	V	@ 5A
	0.91	V	@ 10A
	0.63	V	@ 5A
	0.74	V	@ 10A
I_{RM} Max. Reverse Leakage Current * See Fig. 2 (1)	1	mA	$T_J = 25^\circ\text{C}$
	4	mA	$T_J = 125^\circ\text{C}$
$V_{F(TO)}$ Threshold Voltage	0.47	V	$T_J = T_J$ max.
r_t Forward Slope Resistance	21.46	m Ω	
C_T Typical Junction Capacitance	183	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 < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

Parameters	50WQ...	Units	Conditions
T_J Max. Junction Temperature Range(*)	-40 to 150	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-40 to 150	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case	3.0	$^\circ\text{C}/\text{W}$	DC operation * See Fig. 4
wt Approximate Weight	0.3(0.01)	g(oz.)	
Case Style	D-PAK		Similar to TO-252AA
Device Marking	50WQ10FN		

(*) $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

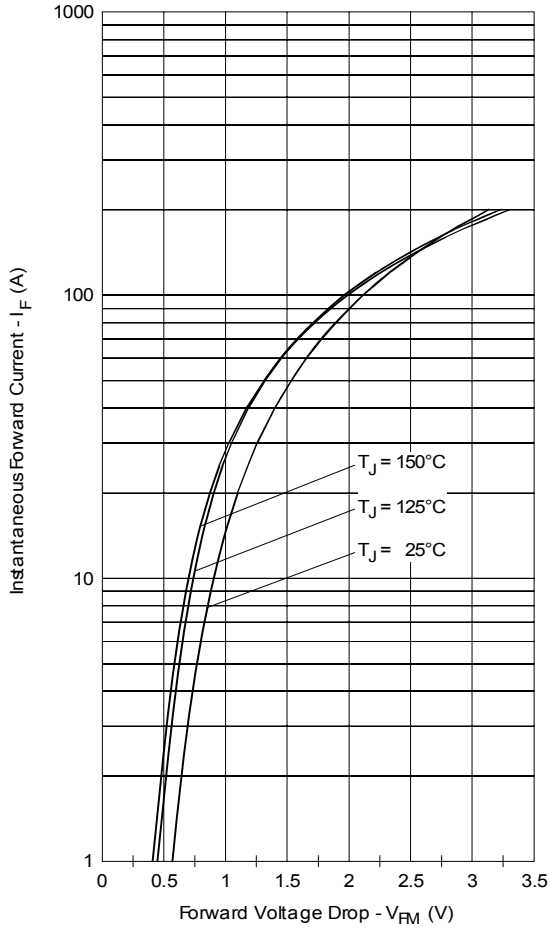


Fig. 1 - Maximum Forward Voltage Drop Characteristics

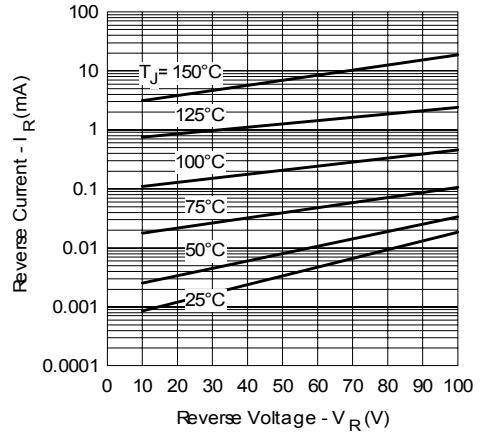


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

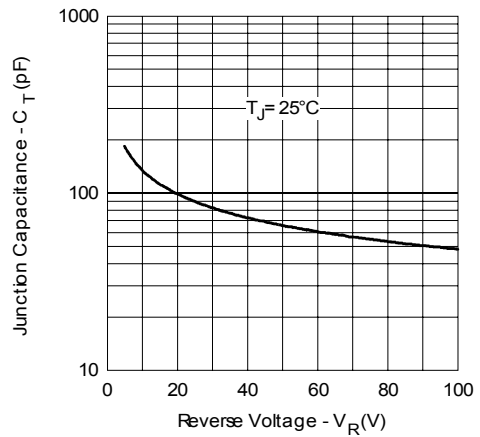


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

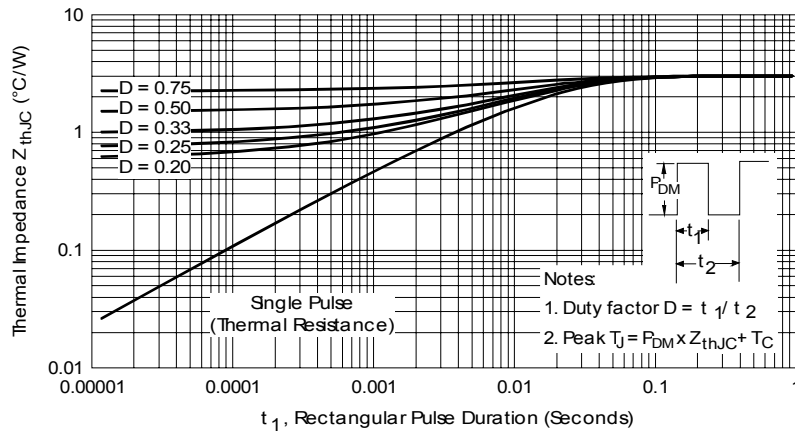


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

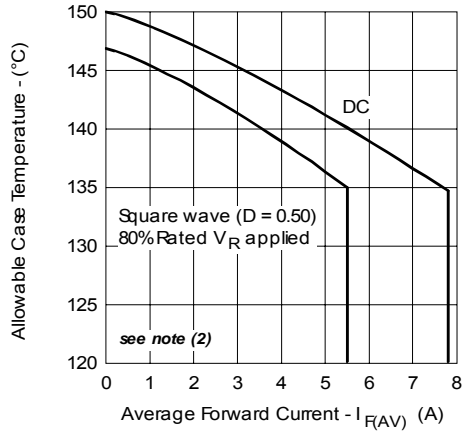


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

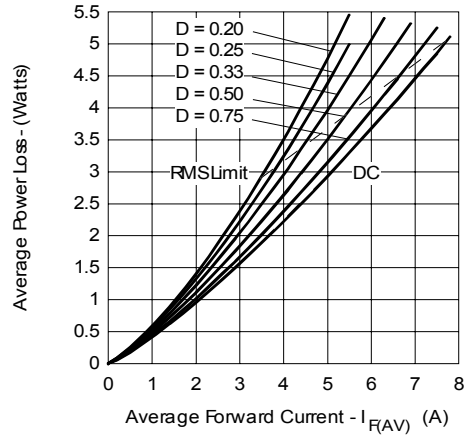


Fig. 6 - Forward Power Loss Characteristics

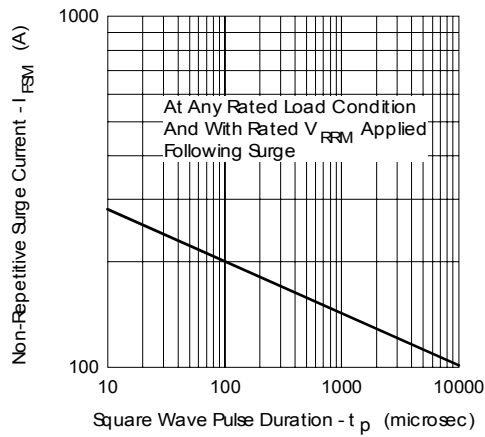


Fig. 7 - Maximum Non-Repetitive Surge Current

(2) Formula used: $T_c = T_j - (P_d + P_{d_{REV}}) \times R_{thJC}$;

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

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

Outline Table

NOTES:
 1- DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
 2- DIMENSIONS ARE SHOWN IN INCHES (MILLIMETERS)
 3- LEAD DIMENSION UNCONTROLLED IN L.S.
 4- DIMENSION D1, E1, L3 & b3 ESTABLISH A MINIMUM MOUNTING SURFACE FOR THERMAL PAD.
 5- SECTION C-C DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN .005 AND .010 (.127 AND .254) FROM THE LEAD TIP.
 6- DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .006 (0.15) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
 7- DIMENSION b1 & c1 APPLIED TO BASE METAL ONLY.
 8- DATUM A & B TO BE DETERMINED AT DATUM PLANE H.
 9- OUTLINE CONFORMS TO JEDEC OUTLINE 10-252AA.

DIM	MILLIMETERS		INCHES		TYP
	MIN.	MAX.	MIN.	MAX.	
A	2.18	2.39	.086	.094	
A1	-	0.13	-	.005	
b	0.64	0.89	.025	.035	7
b1	0.65	0.79	.025	.031	7
b2	0.76	1.14	.030	.045	
b3	4.95	5.46	.196	.216	4
c	0.46	0.61	.018	.024	
c1	0.41	0.56	.016	.022	7
c2	0.46	0.89	.018	.035	
D	5.97	6.32	.235	.249	6
E	6.35	6.73	.250	.265	6
E1	4.32	-	.170	-	6
h	2.29 BSC	-	.090 BSC	-	
H	8.40	10.41	.330	.410	
L	1.40	1.78	.055	.070	
L1	2.74 BSC	-	.108 BSC	-	
L2	0.93 BSC	-	.036 BSC	-	
L3	0.89	1.27	.035	.050	4
L4	1.14	1.52	.045	.060	3
W	10'	10'	10'	10'	
#1	0'	15'	0'	15'	
#2	25'	35'	20'	35'	

LEAD ASSIGNMENTS
 1- GATE
 2- DRAIN
 3- SOURCE
 4- DRAIN

HEXFET
 1- GATE
 2- DRAIN
 3- SOURCE
 4- DRAIN

IGBT & CoPAK
 1- GATE
 2- COLLECTOR
 3- EMITTER
 4- COLLECTOR

Modified JEDEC outline TO-252AA
 Dimensions in millimeters and (inches)

Part Marking Information

EXAMPLE: THIS IS A 50WQ10FN
 LOT CODE 8024
 ASSEMBLED ON WW 02, 2000

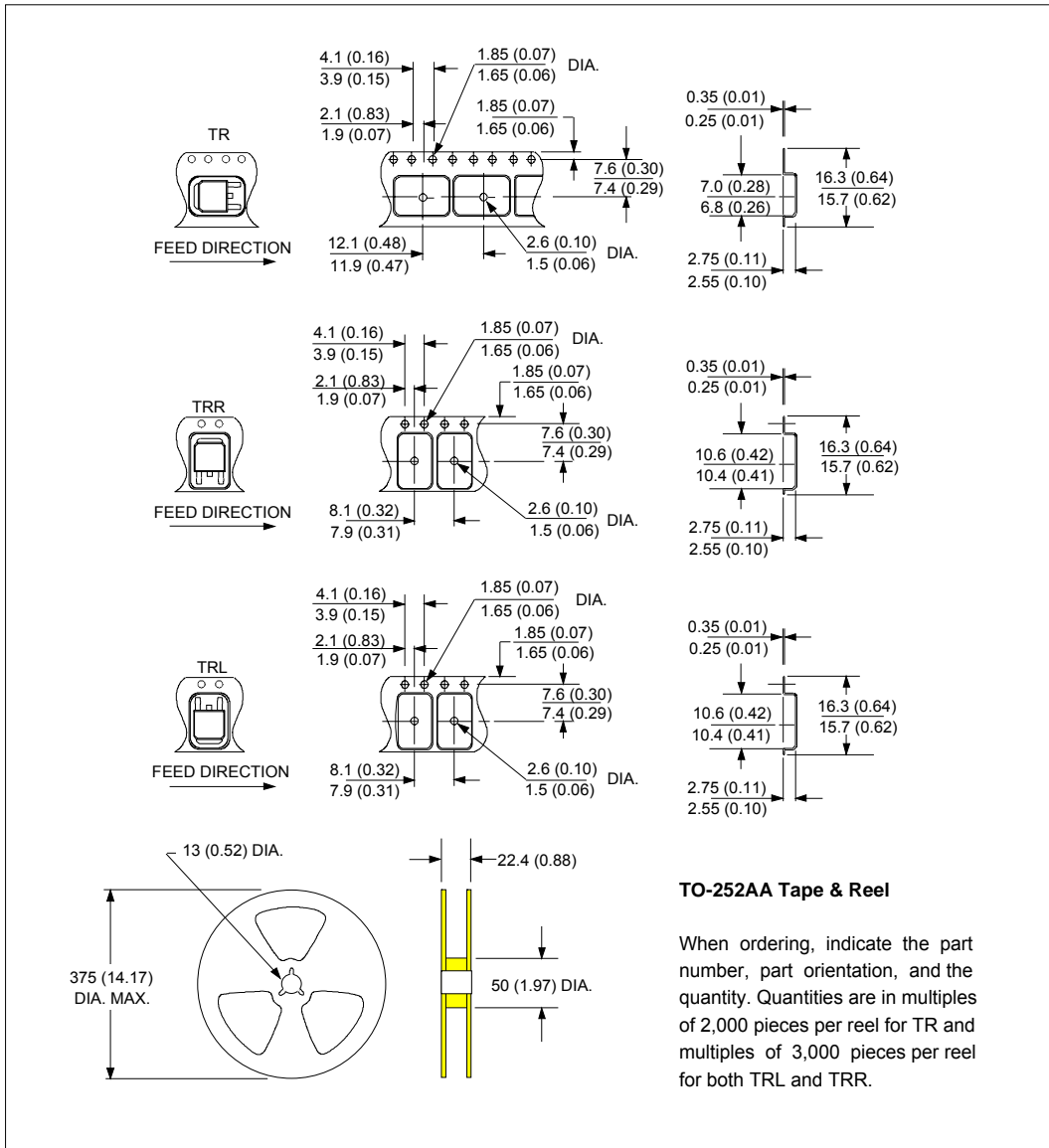
INTERNATIONAL
 RECTIFIER
 LOGO

ASSEMBLY
 LOT CODE

PART NUMBER

DATE CODE
 YEAR 0 = 2000
 WEEK 02
 X = SITE ID

Tape & Reel Information



Ordering Information Table

Device Code	
50	W
Q	10
FN	TRL
-	
①	②
③	④
⑤	⑥
⑦	
1	- Current Rating (5.5A)
2	- Package Identifier W = D-Pak
3	- Schottky "Q" Series
4	- Voltage Rating (10 = 100V)
5	- FN = TO-252AA
6	- <ul style="list-style-type: none"> • none = Tube (50 pieces) • TR = Tape & Reel • TRL = Tape & Reel (Left Oriented) • TRR = Tape & Reel (Right Oriented)
7	- <ul style="list-style-type: none"> • none = Standard Production • PbF = Lead-Free

Data and specifications subject to change without notice.
This product has been designed and qualified for AEC Q101 Level.
Qualification Standards can be found on IR's Web site.