45CIQ100

PD-20356F

Schottky Rectifier High Efficiency Series
Thru -Hole (TO-259AA)
100V, 45A

Features

- Hermetically sealed
- Center tap
- Low forward voltage drops
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- 2 Interdigitated mounting tabs for secured intimate heatsink contact
- Electrically isolated
- ESD rating: Class 3B per MIL-STD-750, Method 1020

Potential Applications

- DC-DC converter
- Protection circuits
- Motor drives

Product Summary

- **V_{RRM}:** 100V
- **$I_{F(AV)}$:** 45A*
- **V_F @ 25Apk, T_J =125°C:** 0.78V
- **I_{FSM} @ t_p = 8.3ms half-sine:** 300A

TO-259AA

Product Validation

Adhered to JANS screening flow according to MIL-PRF-19500 for space applications

Description

The 45CIQ100 Center tap Schottky rectifier has been expressly designed to meet the rigorous requirements of IR HiRel environments. It is packaged in the hermetic isolated TO-259AA package. The device's forward voltage drop, and reverse leakage current are optimized for the lowest power loss and the highest circuit efficiency for typical high frequency switching power supplies and resonent power converters. The device's forward voltage drop, and reverse leakage current are optimized for the lowest power loss and the highest circuit efficiency for typical high frequency switching power supplies and resonant power converters. Full MIL-PRF-19500 quality conformance testing is available on source-controlled drawings to TX, TXV and S levels.

Ordering Information

Table 1 Ordering options

Part number	Package	Screening Level
45CIQQ100	TO-259AA	COTS
45CIQ100SCS	TO-259AA	S-Level
45CIQ100SCX	TO-259AA	TX-Level
45CIQ100SCV	TO-259AA	TXV-Level

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1 Absolute Maximum Ratings

Table 2 Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_R	Max. DC reverse voltage (Per Leg)	100	V
V_{RWM}	Max. Working peak reverse voltage (Per Leg)	100	V
$I_{F(AV)}$	Max. average forward current - Refer to Fig. 5 [1]	45*	A
I_{FSM}	Max. peak one cycle non–repetitive surge current (Per Leg) [2]	300	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	°C
	Weight	10.5(Typical)	g

[1] 50% duty cycle @ T_C=100°C, rectangular waveform

* $I_{F(AV)}$ Current is limited by package.

[2] t_p = 8.3 ms half-sine

2 Device Characteristics

2.1 Electrical Characteristics

Table 3 Electrical Characteristics

Symbol	Parameter	Max.	Unit	Test Conditions	
V_{FM}	Max. Forward Voltage Drop (Per Leg) See Fig. 1 [1]	0.94	V	@ 25A	T_J = -55°C
		1.18	V	@ 45A	
		0.90	V	@ 25A	T_J = 25°C
		1.13	V	@ 45A	
		0.78	V	@ 25A	T_J = 125°C
		0.97	V	@ 45A	
I_{RM}	Max. Reverse Leakage Current (Per Leg) See Fig. 2 [1]	0.80	mA	T_J = 25°C	V_R = rated V_R
		45	mA	T_J = 125°C	
C_J	Max. Junction Capacitance (Per Leg)	1400	pF	V_R = 5V_{DC} (1MHz, 25°C)	
L_S	Series Inductance (Per Leg)	8.7 (Typical)	nH	Measured from anode lead to cathode lead 6mm (0.25 in) from package	

2.2 Thermal-Mechanical Specifications

Table 4 Thermal-Mechanical Specifications

Symbol	Parameter	Max.	Unit	Test Conditions
$R_{\theta JC}$	Max. Thermal Resistance, Junction to Case (Per Leg)	0.83	°C/W	DC operation See Fig. 4
$R_{\theta JC}$	Max. Thermal Resistance, Junction to Case (Per Package)	0.42	°C/W	DC operation
	Die Size (Typical)	196 x 196	mils	

[1] Pulse Width < 300µs, Duty Cycle < 2%

3 Electrical Characteristics Curves

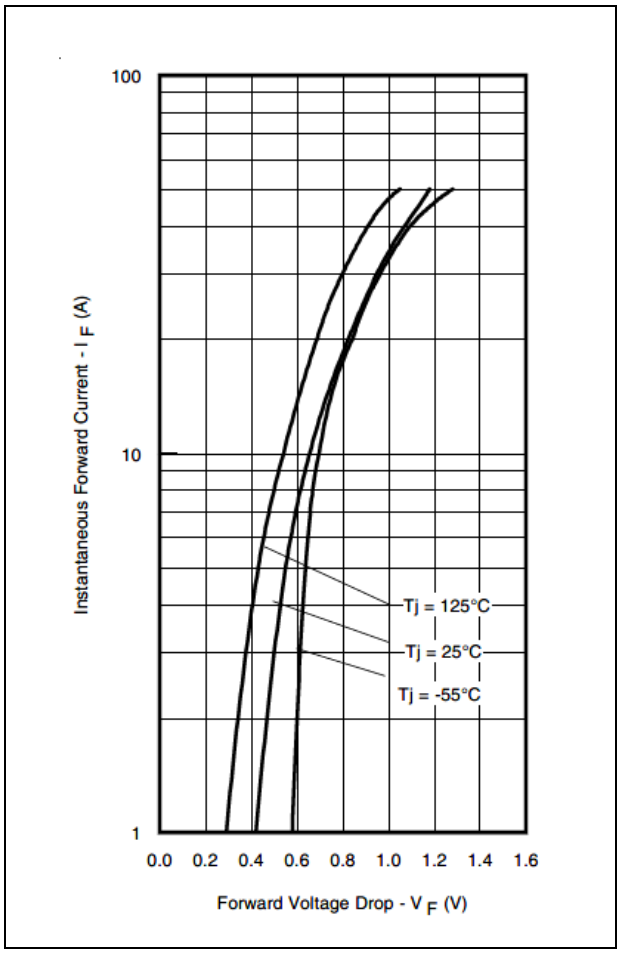


Figure 1 Maximum Forward Voltage Drop Characteristics (Per Leg)

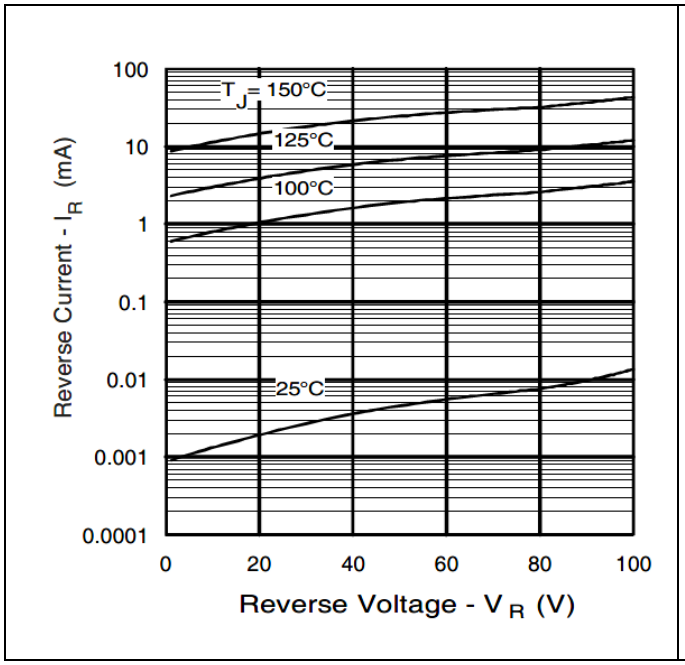


Figure 2 Typical Values of Reverse Current Vs. Reverse Voltage (Per Leg)

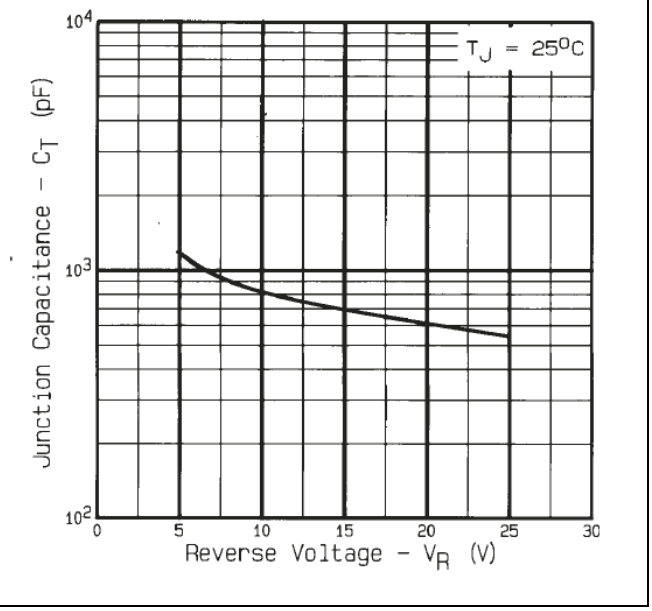


Figure 3 Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

Electrical Characteristics Curves

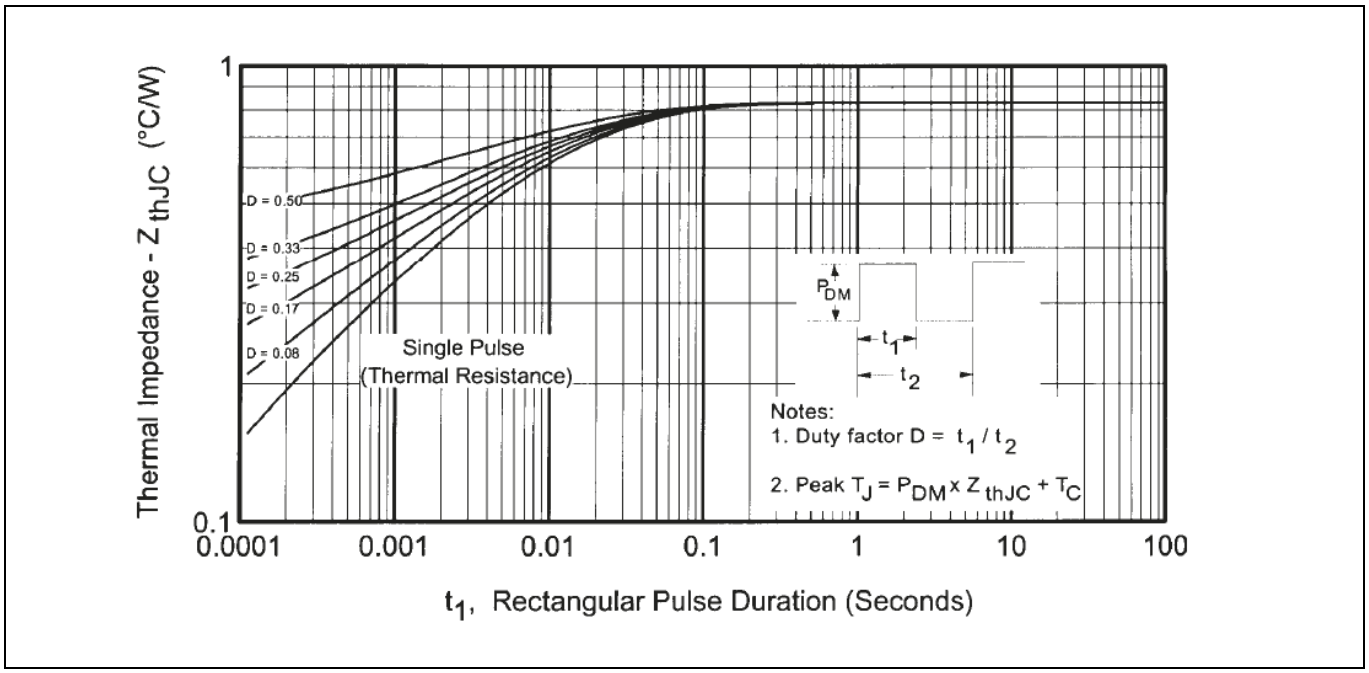


Figure 4 Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

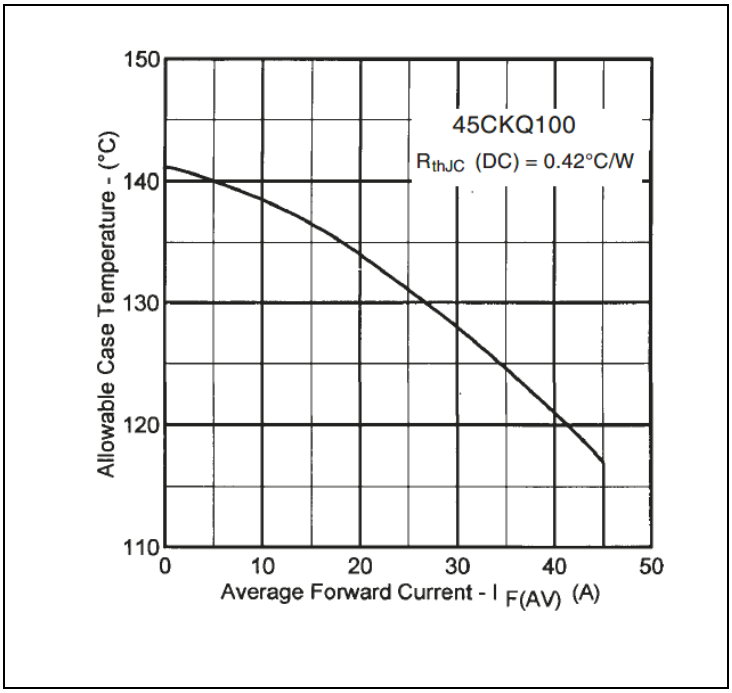
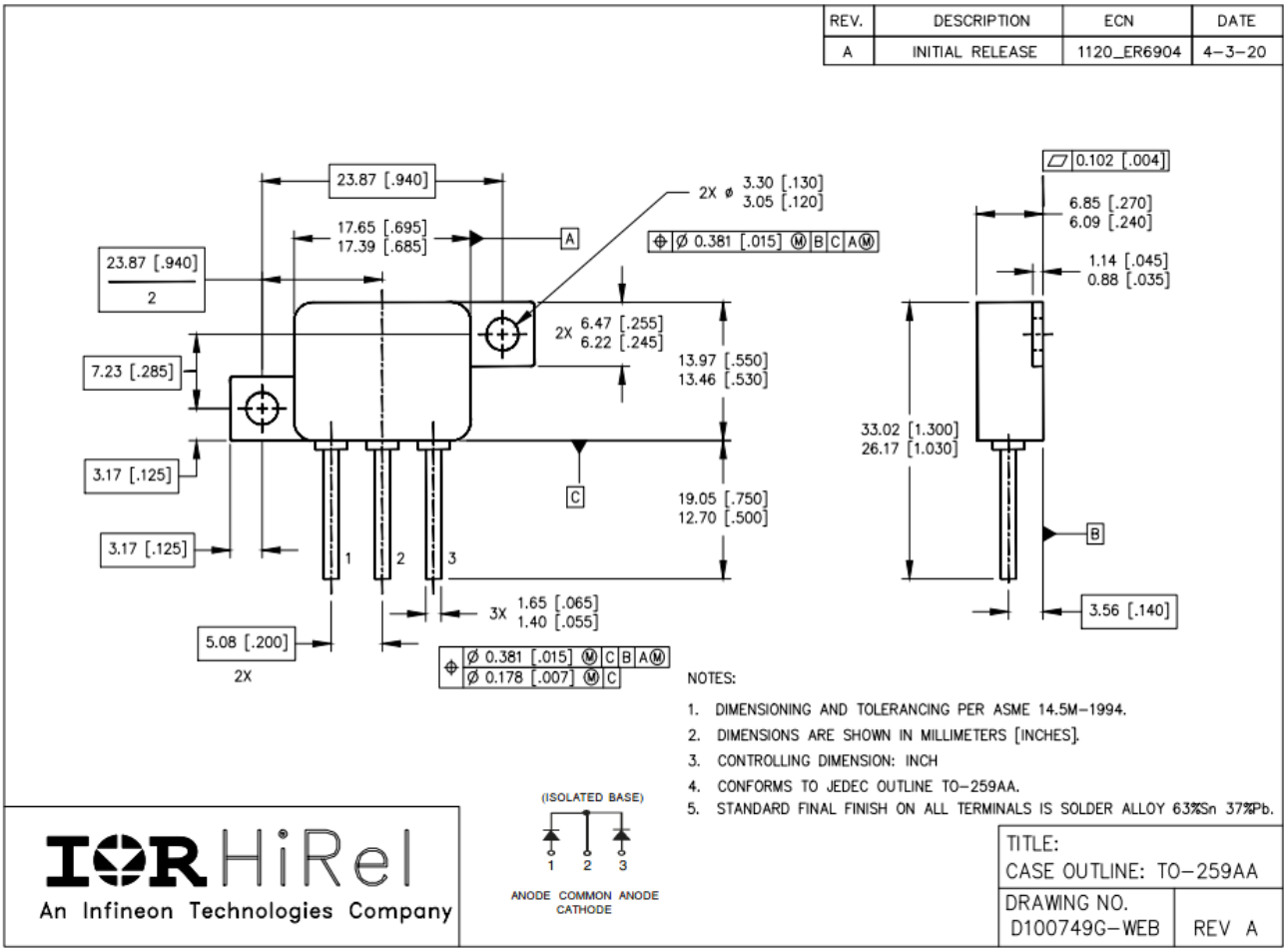


Figure 5 Maximum Allowable Case Temperature Vs. Average Forward Current

4 Package Outline

Note: For the most updated package outline, please see the website: TO-259AA



Revision history

Document version	Date of release	Description of changes
	02/01/1997	Final datasheet (PD-20356B)
Rev C	04/16/1999	Updated package drawing
Rev D	02/26/2002	Updated Format
Rev E	12/14/2015	Updated per ECN-1120_04067
Rev F	01/20/2025	Updated per ECN-1120_10144

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Edition 2025-01-20

Published by

International Rectifier HiRel Products, Inc.

An Infineon Technologies company

El Segundo, California 90245 USA

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Document reference

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