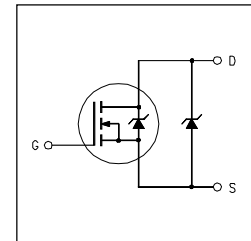
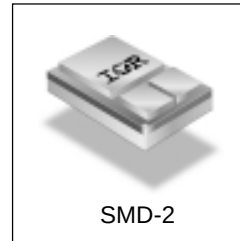


**RAD-HARD
SYNCHRONOUS RECTIFIER
SURFACE MOUNT (SMD-2)**

**IRHSNA57064
60V, N-CHANNEL**

Product Summary

Part Number	RDS(on)	QG
IRHSNA57064	5.6mΩ	180nC



Description:

The SynchFet family of Co-Pack RAD-Hard MOSFETs and Schottky diodes offers the designer an innovative, board space saving solution for switching regulator and power management applications. RAD-Hard MOSFETs utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. Combining this technology with International Rectifier's low forward drop Schottky rectifiers results in an extremely efficient device suitable for use in a wide variety of Military and Space applications.

Features:

- Co-Pack N-channel RAD-Hard MOSFET and Schottky Diode
- Ideal for Synchronous Rectifiers in DC-DC Converters up to 75A Output
- Low Conduction Losses
- Low Switching Losses
- Low Vf Schottky Rectifier
- Refer to IRHSLNA57064 for Lower Inductance

Absolute Maximum Ratings

	Parameter		Units
ID@ VGS = 12V, TC = 25°C	Continuous Drain or Source Current	75*	A
ID@ VGS = 12V, TC = 100°C	Continuous Drain or Source Current	75*	
IDM	Pulse Drain Current ①	300	
PD @ TC = 25°C	Power Dissipation	250	W
	Linear Derating Factor	2.0	W/°C
VGS	Gate-to-Source Voltage	+20	V
VDS	Drain-to-Source Voltage	60	
IF(AV)@VGS = 12V, TC = 25°C	Schottky and Body Diode Avg. Forward Current③	75*	A
IF(AV)@VGS = 12V, TC = 100°C	Schottky and Body Diode Avg. Forward Current③	75*	
TJ, TSTG	Operating Junction and Storage Temperature Range	-55 to 150	°C
	Package Mounting Surface Temperature	300 (for 10sec)	
	Weight	3.3 (Typical)	

* Current is limited by package
For footnotes refer to the last page

Electrical Characteristics @ T_J = 25°C (Unless Otherwise Specified)

	Parameter	Min	Typ	Max	Units	Test Conditions
B _V D _{SS}	Drain-to-Source Breakdown Voltage	60	—	—	V	V _{GS} = 0V, I _D = 1.0mA
R _{DS(on)}	Static Drain-to-Source On-State Resistance	—	—	5.6	mΩ	V _{GS} = 12V, I _D = 45A②
V _{GS(th)}	Gate Threshold Voltage	2.0	—	4.0	V	V _{DS} = V _{GS} , I _D = 1.0mA
g _{fs}	Forward Transconductance	45	—	—	S (Ω)	V _{DS} ≥ 15V, I _{DS} = 45A②
I _{DSS}	Zero Gate Voltage Drain Current	—	—	50	μA	V _{DS} = 48V, V _{GS} = 0V
		—	—	50	mA	V _{DS} = 48V, V _{GS} = 0V, T _J = 125°C
I _{GSS}	Gate-to-Source Leakage Forward	—	—	100	nA	V _{GS} = 20V
I _{GSS}	Gate-to-Source Leakage Reverse	—	—	-100	nA	V _{GS} = -20V
Q _g	Total Gate Charge	—	—	180	nC	V _{GS} = 12V, I _D = 45A, V _{DS} = 30V
Q _{gs}	Gate-to-Source Charge	—	—	55	nC	
Q _{gd}	Gate-to-Drain ('Miller') Charge	—	—	65	nC	
t _{d(on)}	Turn-On Delay Time	—	—	35	ns	V _{DD} = 30V, I _D = 45A, V _{GS} = 12V, R _G = 2.35Ω
t _r	Rise Time	—	—	125	ns	
t _{d(off)}	Turn-Off Delay Time	—	—	75	ns	
t _f	Fall Time	—	—	50	ns	
L _S + L _D	Total Inductance	—	7.03	—	nH	Measured from center of drain pad to center of source pad

Schottky Diode & Body Diode Ratings and Characteristics

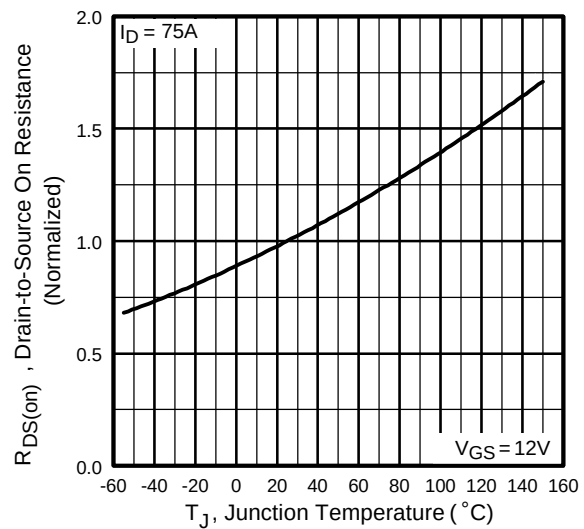
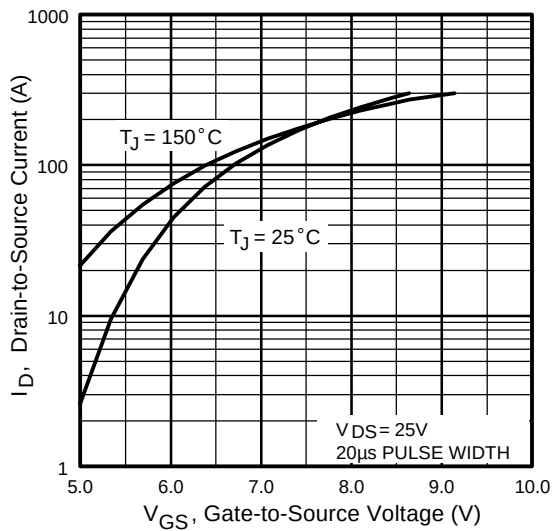
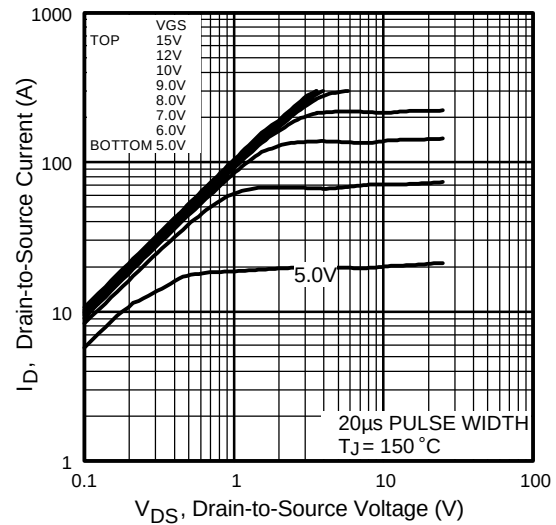
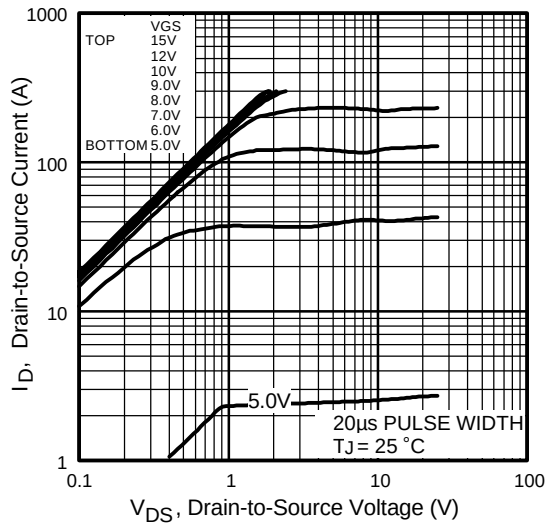
	Parameter	Min	Typ	Max	Units	Test Conditions
V _{SD}	Diode Forward Voltage	—	—	0.93	V	T _J = -55°C, I _D = 45A, V _{GS} = 0V②
		—	—	0.86	V	T _J = 25°C, I _D = 45A, V _{GS} = 0V②
		—	—	0.76	V	T _J = 110°C, I _D = 45A, V _{GS} = 0V②
t _{rr}	Reverse Recovery Time	—	—	100	nS	T _J = 25°C, I _F = 45A, di/dt ≤ 100A/μs
Q _{RR}	Reverse Recovery Charge	—	—	210	nC	V _{DS} ≤ 30V
L _S + L _D	Total Inductance	—	8.09	—	nH	Measured from center of drain pad to center of source pad (for Schottky only)
t _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible. Turn-on speed is substantially controlled by L _S + L _D				

Thermal Resistance

	Parameter	Min	Typ	Max	Units	Test Conditions
R _{thJC}	Junction-to-Case (MOSFET)	—	—	0.5	°C/W	
R _{thJC}	Junction-to-Case (Schottky)	—	—	0.7	°C/W	

Note: Corresponding Spice and Saber models are available on the Website.

For footnotes refer to the last page



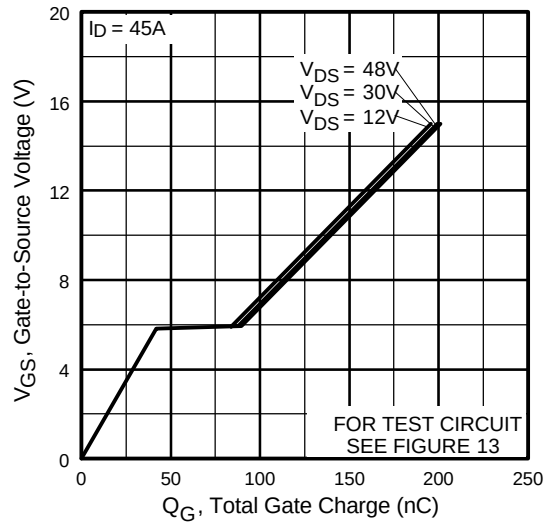


Fig 5. Typical Gate Charge Vs. Gate-to-Source Voltage

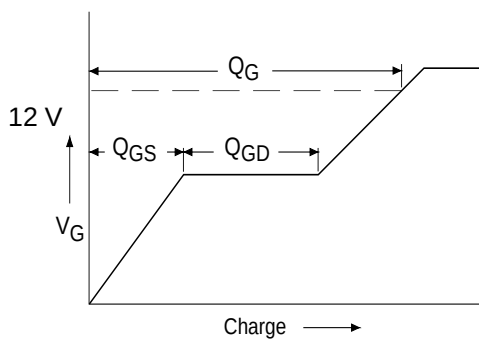


Fig 5a. Basic Gate Charge Waveform

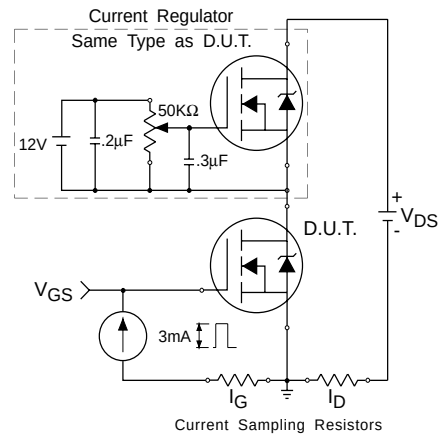


Fig 5b. Gate Charge Test Circuit

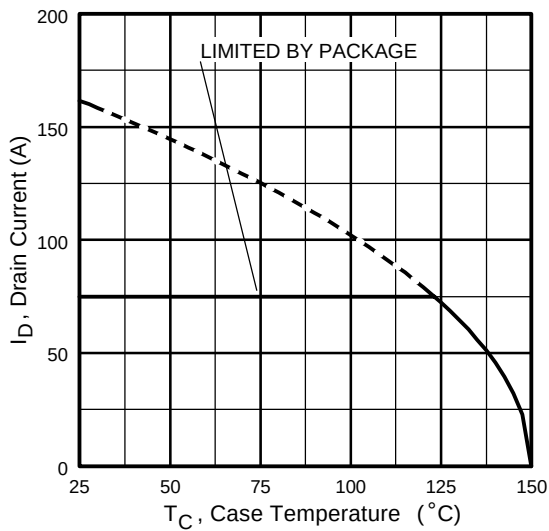


Fig 6. Maximum Drain Current Vs. Case Temperature

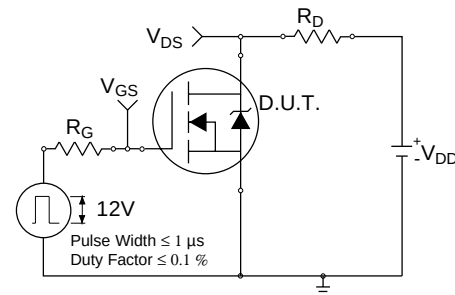


Fig 7a. Switching Time Test Circuit

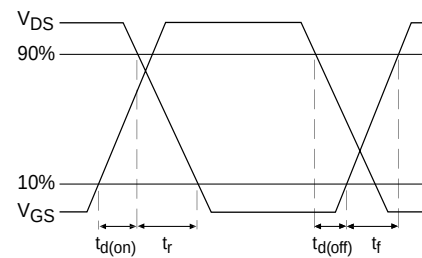


Fig 7b. Switching Time Waveforms

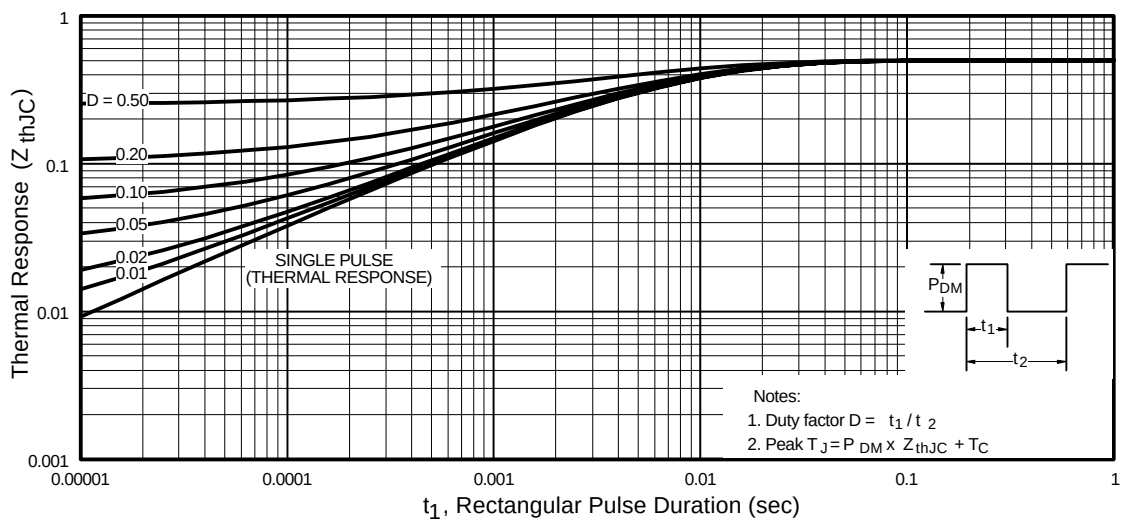


Fig 8. Maximum Effective Transient Thermal Impedance, Junction-to-Case, MOSFET

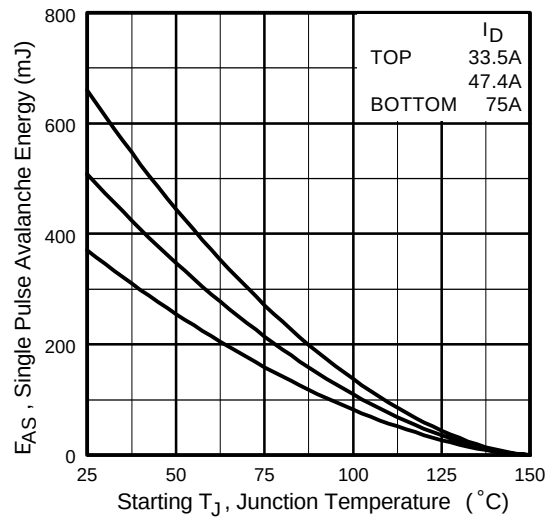


Fig 9. Maximum Avalanche Energy
Vs. Drain Current

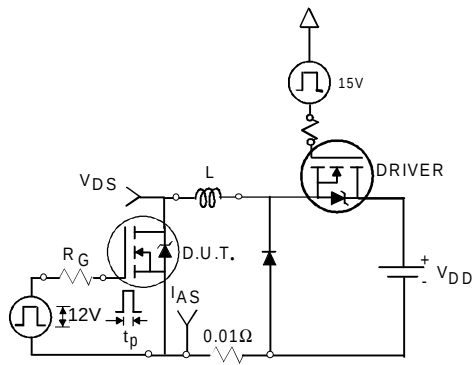


Fig 9a. Unclamped Inductive Test Circuit

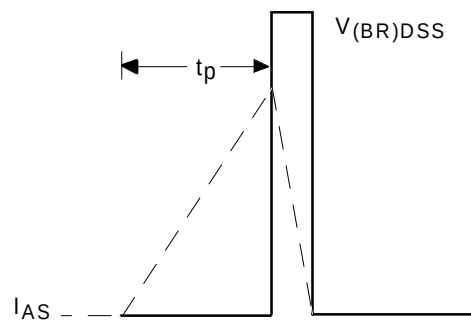


Fig 9b. Unclamped Inductive Waveforms

MOSFET Body Diode & Schottky Diode Characteristics

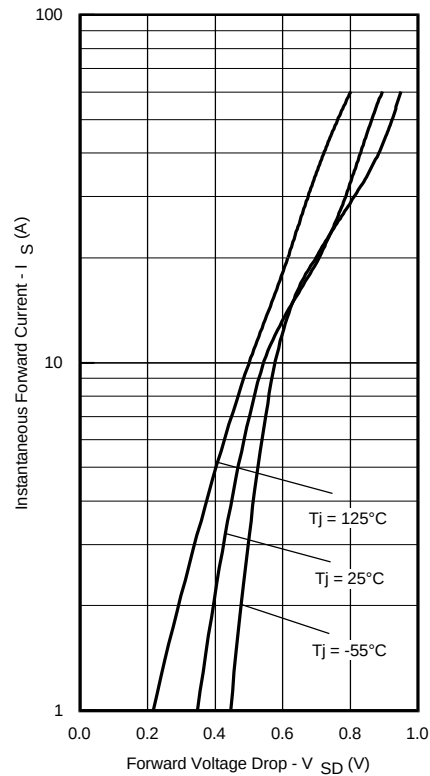


Fig. 10 - Typical Forward Voltage Drop Characteristics

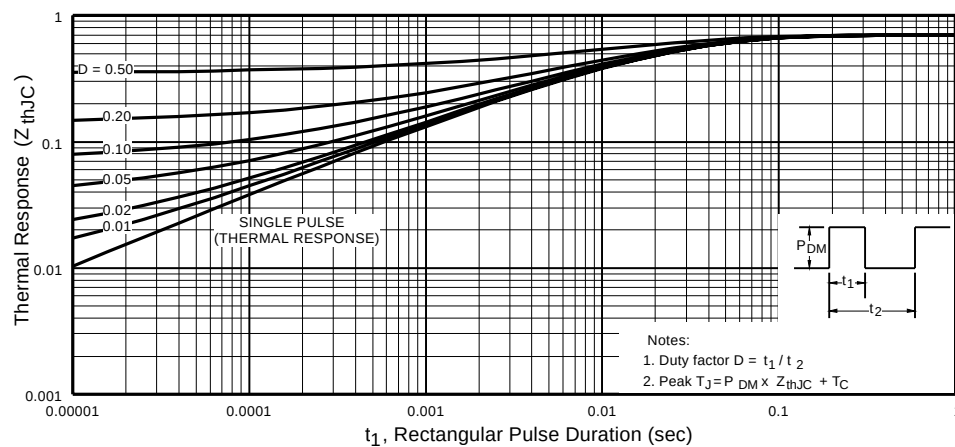


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case, Schottky
www.irf.com

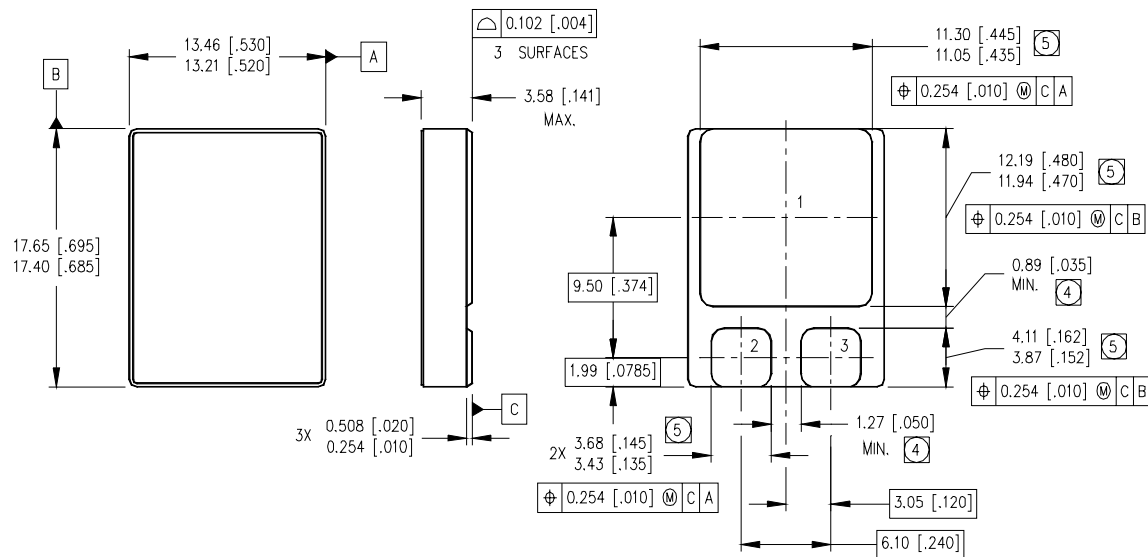
IRHSNA57064

International
IR Rectifier

Footnotes:

- ① Repetitive Rating; Pulse width limited by maximum junction temperature
- ② Pulse width $\leq 300 \mu\text{s}$; Duty Cycle $\leq 2\%$
- ③ 50% Duty Cycle, Rectangular

Case Outline and Dimensions — SMD-2



International
IR Rectifier

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Data and specifications subject to change without notice. 03/02