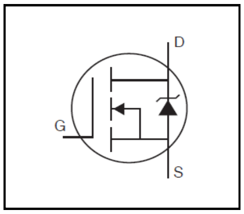
IRFP260MPbF

IR MOSFET™

Features

- Advanced Process Technology
- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated
- Ease of Paralleling
- Simple Drive Requirements
- Lead-Free

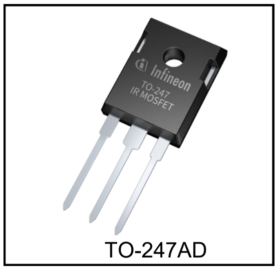


$V_{(BR)DSS}$	**200V**
$R_{DS(on)}$ **max.**	**0.04Ω**
I_D	**50A**

Description

IR MOSFET™ technology from Infineon utilizes advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and rugged device design that IR MOSFET™ devices are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The TO-247 package is preferred for commercial-industrial applications where higher power levels preclude the use of TO-220 devices. The TO-247 is similar but superior to the earlier TO-218 package because of its isolated mounting hole.



TO-247AD

G	D	S
Gate	Drain	Source

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRFP260MPbF	TO-247AD	Tube	25	IRFP260MPbF

Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	50	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	35	
I_{DM}	Pulsed Drain Current ①⑤	200	
P_D @T_C = 25°C	Maximum Power Dissipation	300	W
	Linear Derating Factor	2.0	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy ②⑤	560	mJ
I_{AR}	Avalanche Current ①⑤	50	A
E_{AR}	Repetitive Avalanche Energy ①	30	mJ
dv/dt	Peak Diode Recovery dv/dt③⑤	10	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 175	°C
	Soldering Temperature, for 10 seconds (1.6mm from case)	300	
	Mounting torque, 6-32 or M3 screw	10 lbf•in (1.1N•m)	

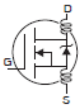
Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	——	0.50	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	0.24	——	
$R_{\theta JA}$	Junction-to-Ambient	——	40	

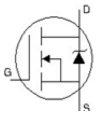
Electrical characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	200	——	——	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	0.26	——	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	——	0.04	Ω	V_{GS} = 10V, I_D = 28A ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	——	4.0	V	V_{DS} = V_{GS}, I_D = 250µA
gfs	Forward Trans conductance	27	——	——	S	V_{DS} = 50V, I_D = 28A④
I_{DSS}	Drain-to-Source Leakage Current	——	——	25	µA	V_{DS} = 200V, V_{GS} = 0V
		——	——	250		V_{DS} = 160V,V_{GS} = 0V,T_J =150°C
I_{GSS}	Gate-to-Source Forward Leakage	——	——	100	nA	V_{GS} = 20V
	Gate-to-Source Reverse Leakage	——	——	-100		V_{GS} = -20V

Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

Q_g	Total Gate Charge	——	——	234	nC	I_D = 28A
Q_{gs}	Gate-to-Source Charge	——	——	38		V_{DS} = 160V
Q_{gd}	Gate-to-Drain Charge	——	——	110		V_{GS} = 10V, See Fig.6 and 13 ④
$t_{d(on)}$	Turn-On Delay Time	——	17		ns	V_{DD} = 100V
t_r	Rise Time	——	60	——		I_D = 28A
$t_{d(off)}$	Turn-Off Delay Time	——	55	——		R_G= 1.8Ω
t_f	Fall Time	——	48	——		V_{GS} = 10V, See Fig.10④
L_D	Internal Drain Inductance	——	5.0	——	nH	Between lead, 6mm (0.25in.) from package and center of die contact 
L_S	Internal Source Inductance	——	13	——		
C_{iss}	Input Capacitance	——	4057	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	603	——		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	——	161	——		ƒ = 1.0MHz, See Fig.5

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	——	——	50	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	——	——	200		
V_{SD}	Diode Forward Voltage	——	——	1.3	V	T_J = 25°C,I_S = 28A,V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	——	268	402	ns	T_J = 25°C ,I_F = 28A
Q_{rr}	Reverse Recovery Charge	——	1.9	2.8	µC	di/dt = 100A/µs ④

Notes:

① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11).

② Starting T_J = 25°C, L = 1.5mH, R_G = 25Ω, I_{AS} = 28A.(See fig. 12).

③ $I_{SD} \leq$ 28A, di/dt $\leq$ 486A/µs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq$ 175°C.

④ Pulse width $\leq$ 400µs; duty cycle $\leq$ 2%.

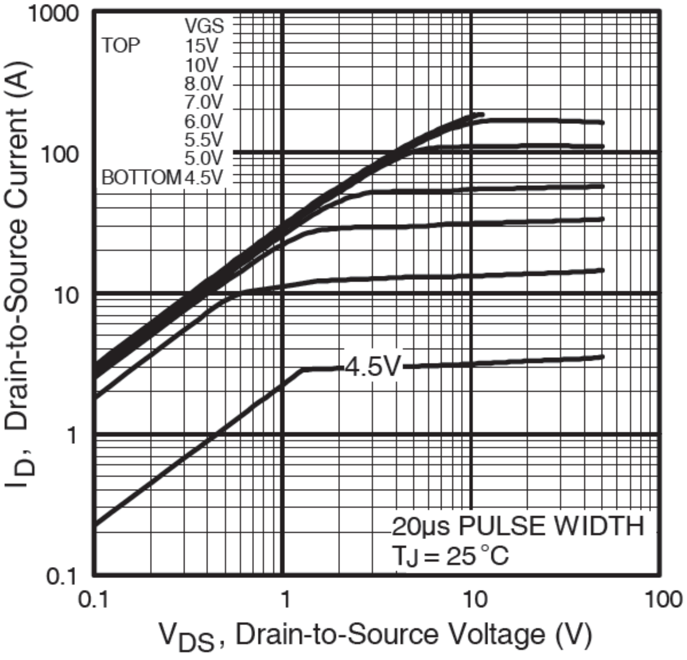


Fig. 1 Typical Output Characteristics

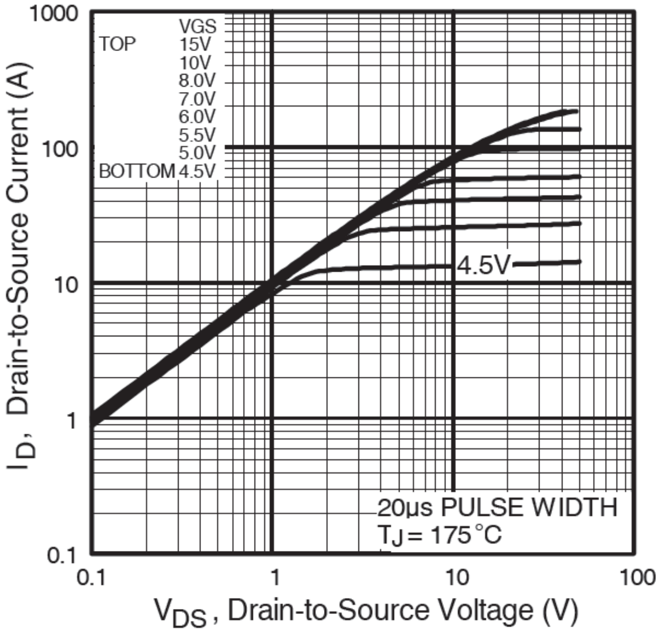


Fig. 2 Typical Output Characteristics

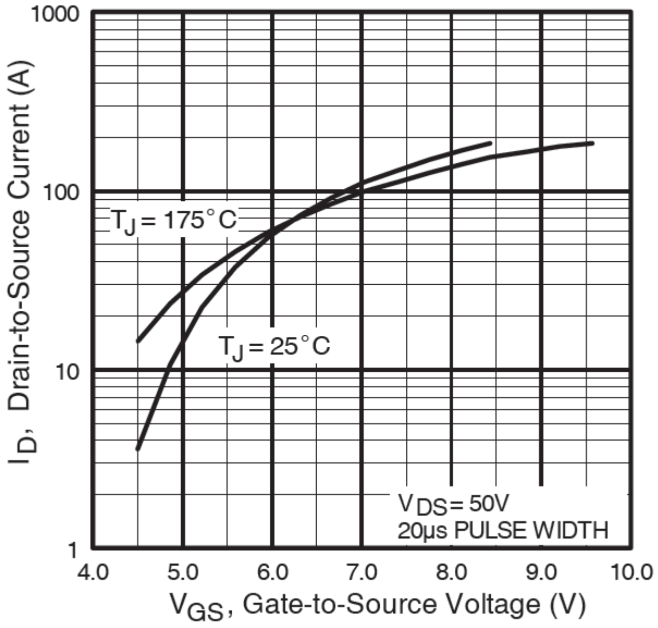


Fig. 3 Typical Transfer Characteristics

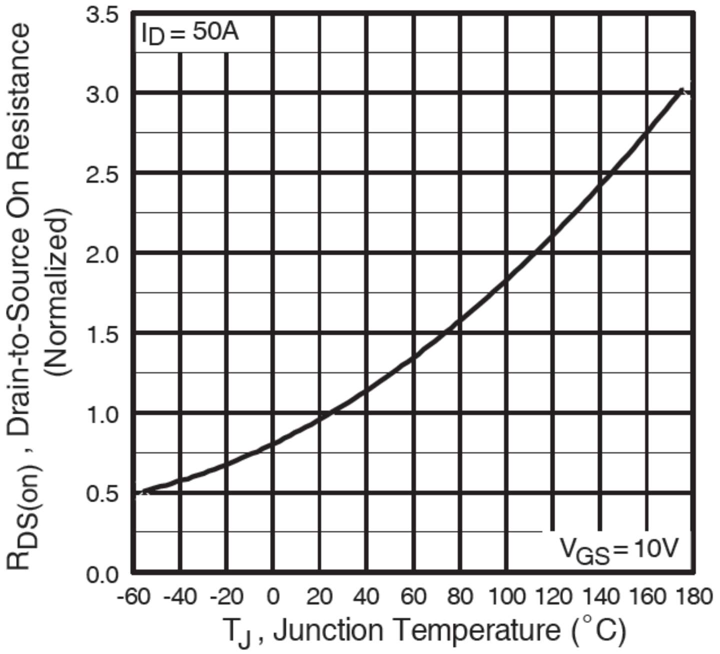


Fig. 4 Normalized On-Resistance vs. Temperature

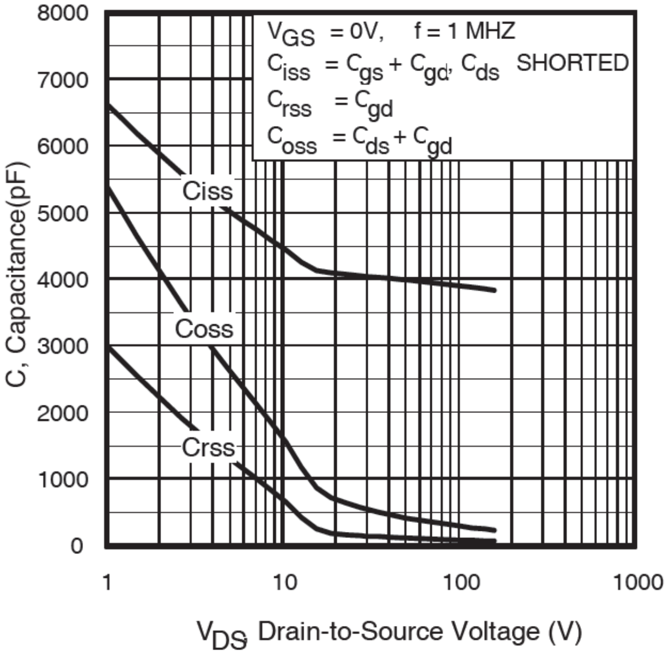


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

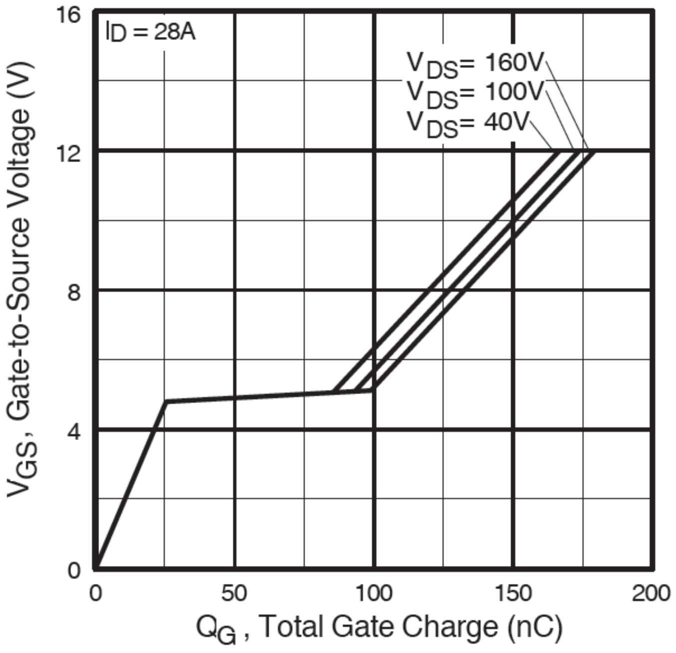


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

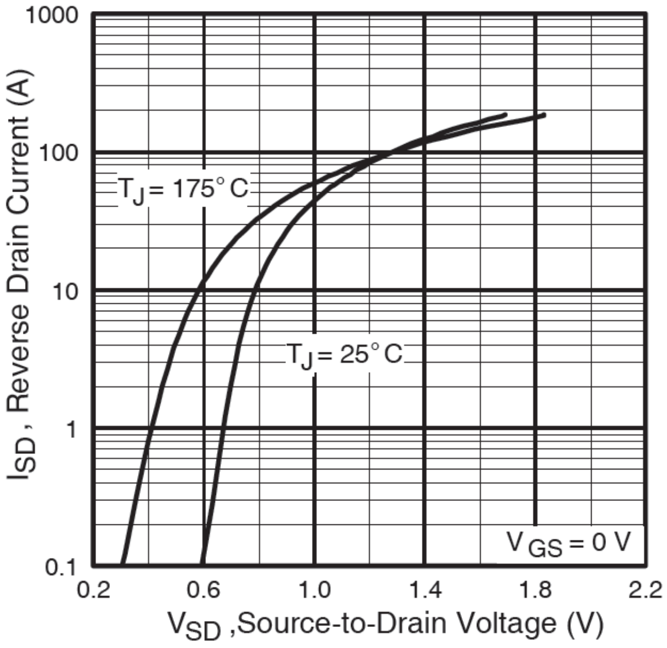


Fig. 7 Typical Source-to-Drain Diode Forward Voltage

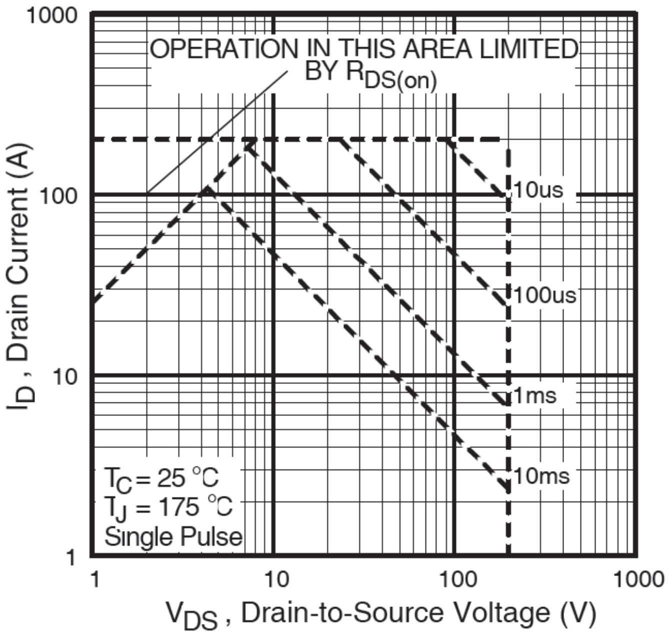


Fig 8. Maximum Safe Operating Area

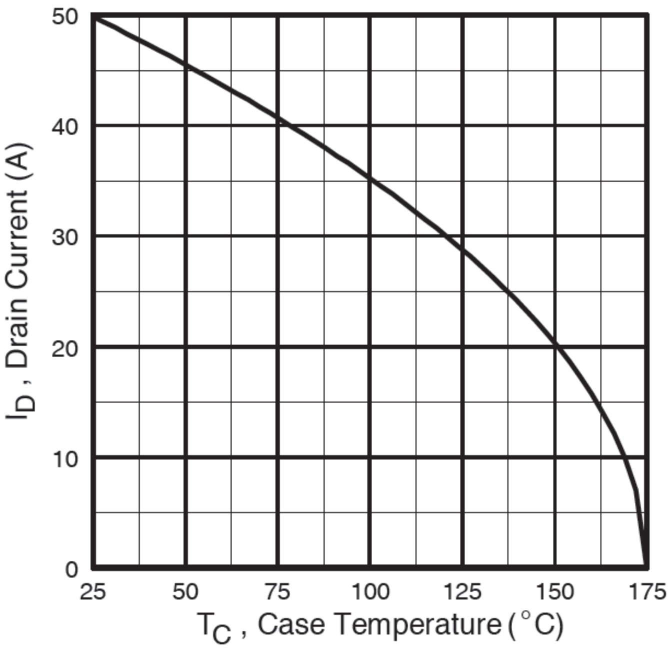


Fig 9. Maximum Drain Current vs. Case Temperature

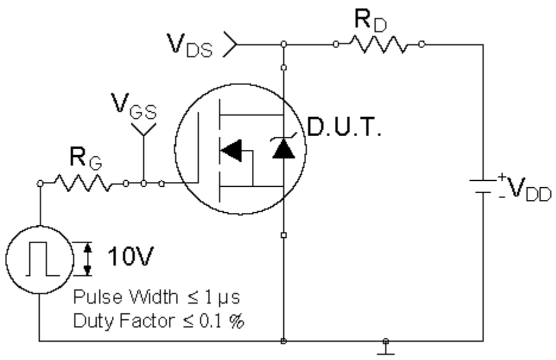


Fig 10a. Switching Time Test Circuit

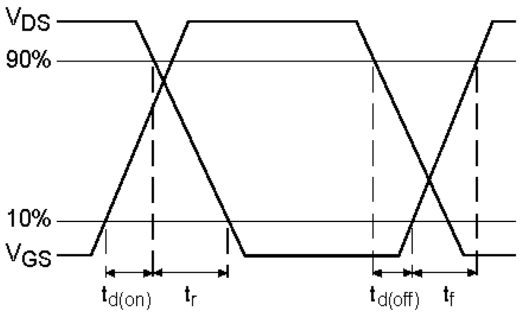


Fig 10a. Switching Time Waveforms

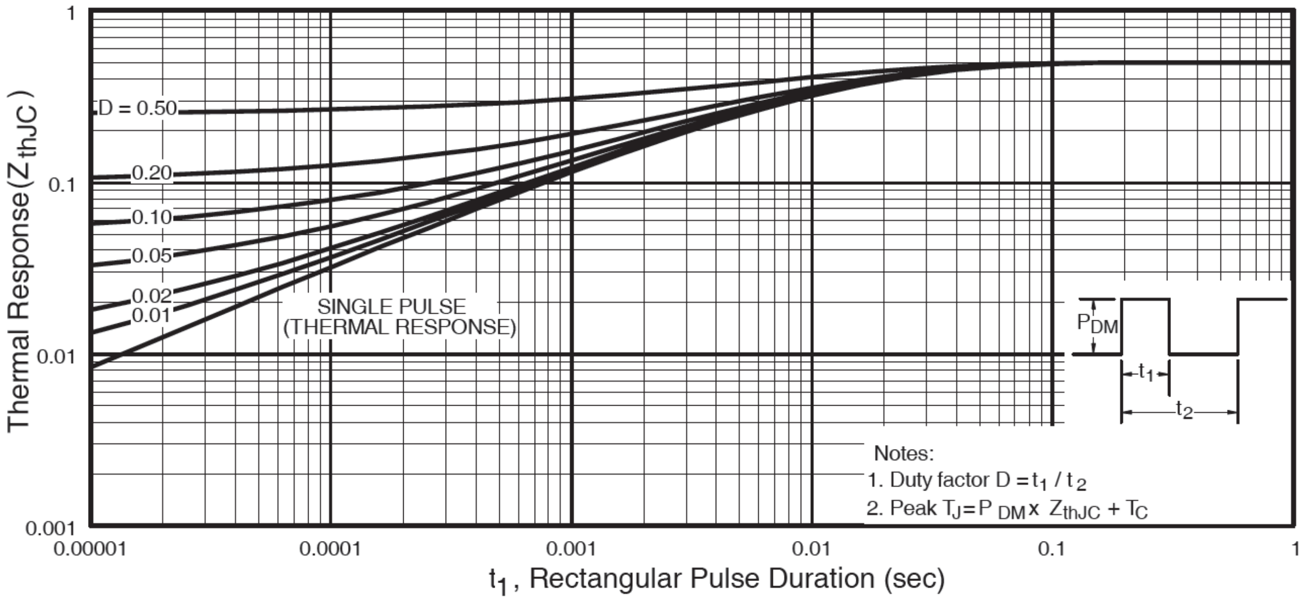


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

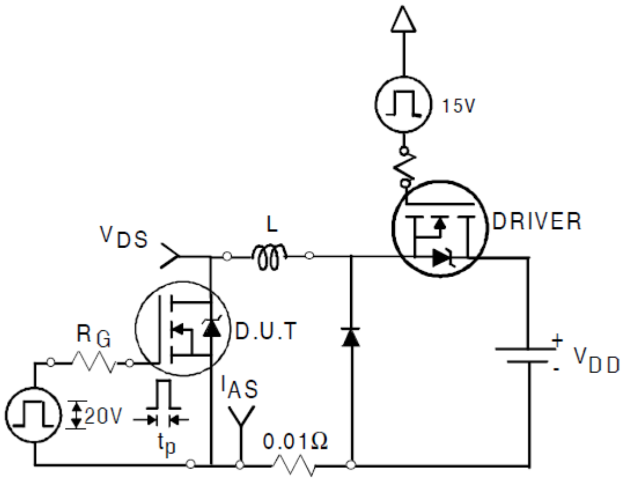


Fig. 12a. Unclamped Inductive Test Circuit

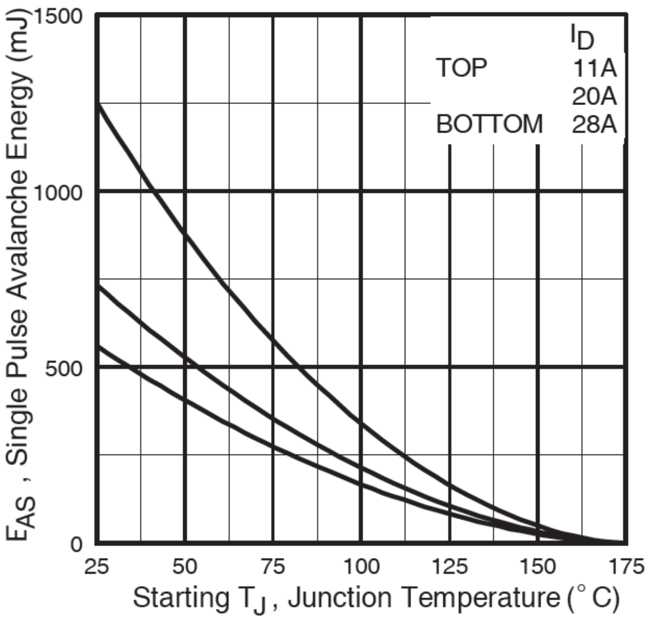


Fig 12c. Maximum Avalanche Energy vs. Drain Current

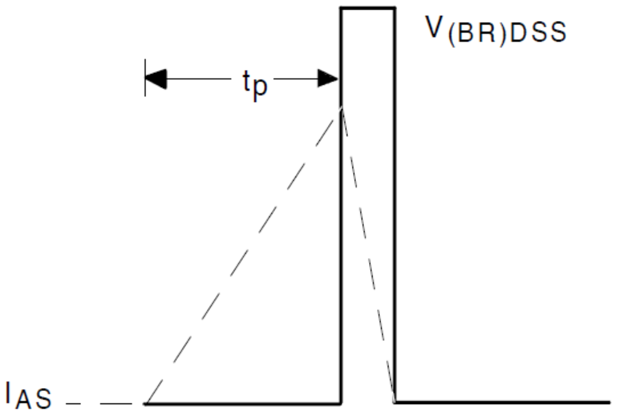


Fig. 12b. Unclamped Inductive Waveforms

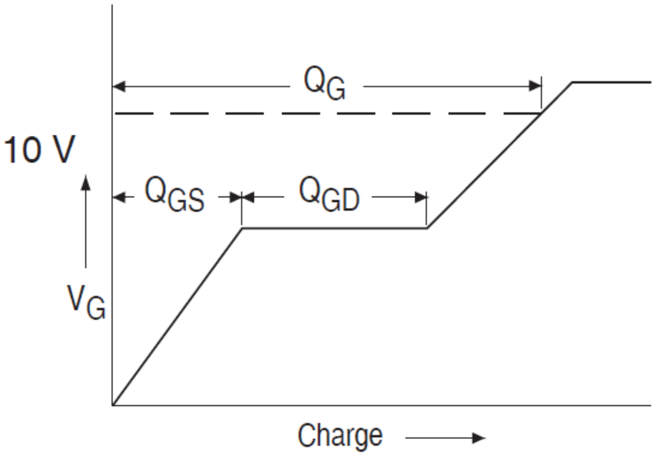


Fig 13a. Basic Gate Charge Waveform

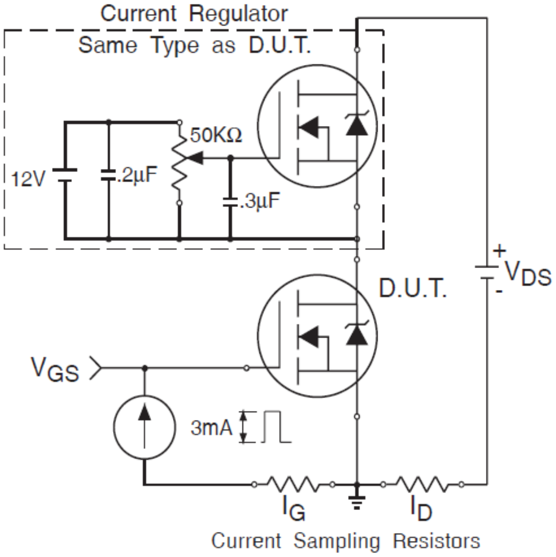
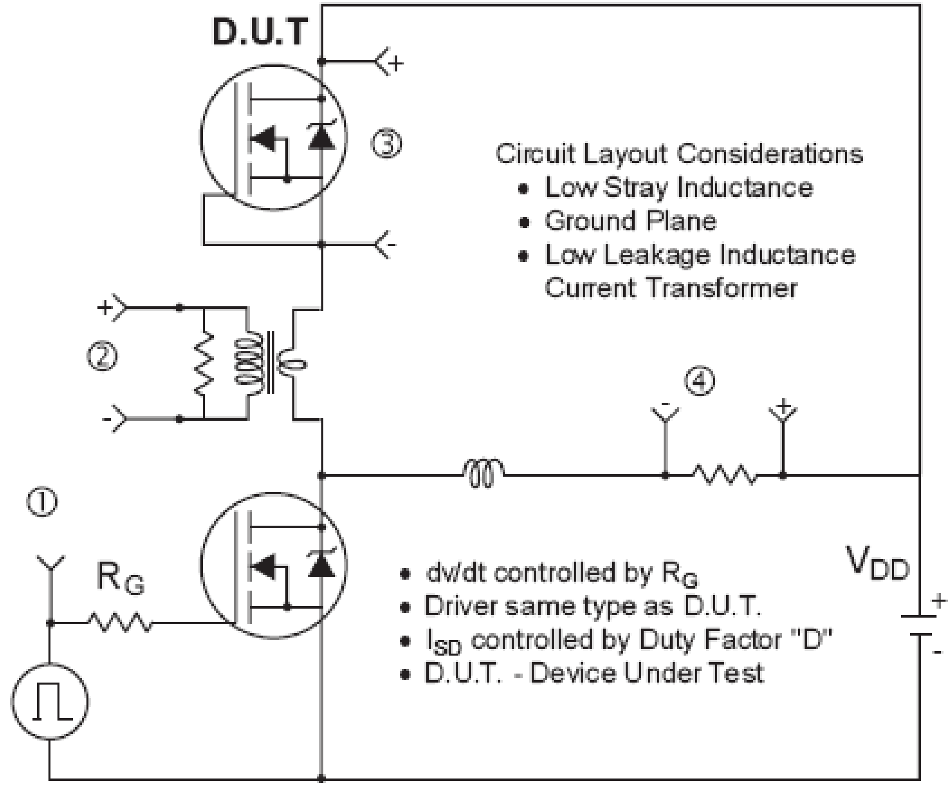
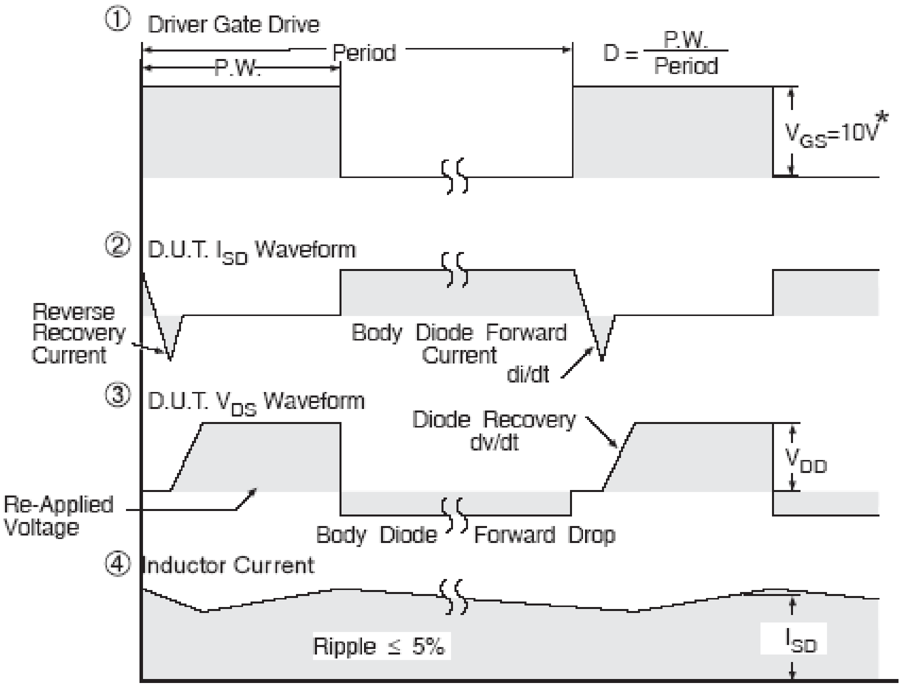


Fig 13b. Gate Charge Test Circuit

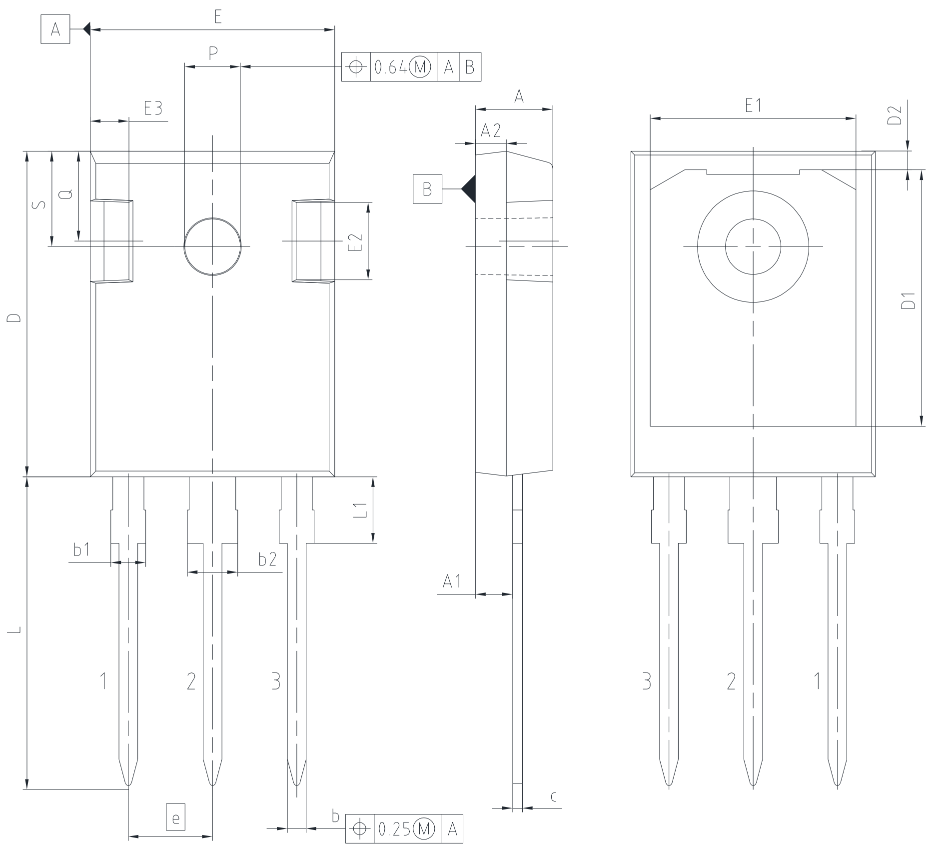




* V_{GS} = 5V for Logic Level Devices

Fig 14. Peak Diode Recovery dv/dt Test Circuit for N-Channel IR MOSFET™

TO-247AD Package Outline (Dimensions are shown in millimeters (inches))



DIMENSIONS	MILLIMETERS	
	MIN.	MAX.
A	4.70	5.30
A1	2.20	2.60
A2	1.50	2.50
b	1.00	1.40
b1	1.60	2.41
b2	2.57	3.43
c	0.38	0.89
D	20.70	21.50
D1	13.08	17.65
D2	0.51	1.35
E	15.50	16.30
E1	12.38	14.15
E2	3.40	5.10
E3	1.00	2.60
e	5.44	
L	19.80	20.40
L1	3.85	4.50
P	3.50	3.70
Q	5.35	6.25
S	6.04	6.30

DOCUMENT NO.
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REVISION
06

SCALE 3:1
0 1 2 3 4 5mm

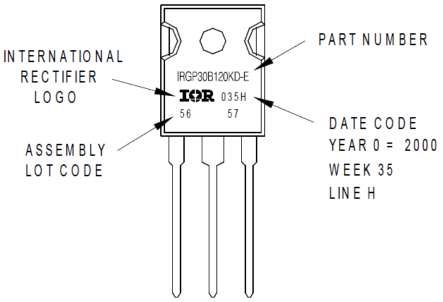
EUROPEAN PROJECTION

ISSUE DATE
25.07.2018

TO-247AD Part Marking Information

EXAMPLE: THIS IS AN IRGP30B120KD-E
WITH ASSEMBLY
LOT CODE 5657
ASSEMBLED ON WW 35, 2000
IN THE ASSEMBLY LINE "H"

Note: "P" in assembly line position
indicates "Lead-Free"



Revision History

Date	Comments
05/28/2020	- Updated datasheet with corporate template - Updated Package picture-page1 - Corrected from "Hexfet power MOSFET" to " IR MOSFET™" -page1 &7 - Corrected part marking from TO-247AC to TO-247AD on page 8.

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