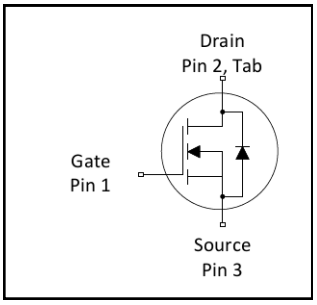
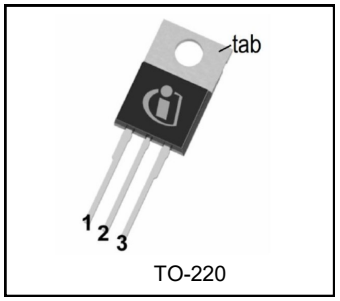
IRFB4115PbF

$V_{(BR)DSS}$	150V
$R_{DS(on)}$ typ.	9.3mΩ
max.	11mΩ
$I_{D\ (Silicon\ Limited)}$	104A





G	D	S
Gate	Drain	Source

Applications

- High Efficiency Synchronous Rectification in SMPS
- Uninterruptible Power Supply
- High Speed Power Switching
- Hard Switched and High Frequency Circuits

Benefits

- Improved Gate, Avalanche and Dynamic dv/dt Ruggedness
- Fully Characterized Capacitance and Avalanche SOA
- Enhanced body diode dV/dt and dI/dt Capability
- Lead Free
- RoHS Compliant, Halogen-Free

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRFB4115PbF	TO-220	Tube	50	IRFB4115PbF

Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	104	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	74	
I_{DM}	Pulsed Drain Current ①	420	
P_D @T_C = 25°C	Maximum Power Dissipation	380	W
	Linear Derating Factor	2.5	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak Diode Recovery ③	18	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)	

Avalanche Characteristics

E_{AS}	Single Pulse Avalanche Energy (Thermally Limited) ②	830	mJ

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case ⑧	–––	0.4	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	0.50	–––	
$R_{\theta JA}$	Junction-to-Ambient ⑦⑧	–––	62	

Static @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	150	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.18	—	V/°C	Reference to 25°C, I_D = 3.5mA ①
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	9.3	11	mΩ	V_{GS} = 10V, I_D = 62A ④
$V_{GS(th)}$	Gate Threshold Voltage	3.0	—	5.0	V	V_{DS} = V_{GS}, I_D = 250µA
I_{DSS}	Drain-to-Source Leakage Current	—	—	20	µA	V_{DS} = 150V, V_{GS} = 0V
		—	—	250		V_{DS} = 150V,V_{GS} = 0V,T_J =125°C
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V_{GS} = 20V
	Gate-to-Source Reverse Leakage	—	—	-100		V_{GS} = -20V
R_G	Gate Resistance	—	2.3	—	Ω	

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

gfs	Forward Trans conductance	97	—	—	S	V_{DS} = 50V, I_D = 62A
Q_g	Total Gate Charge	—	77	120	nC	I_D = 62A
Q_{gs}	Gate-to-Source Charge	—	28	—		V_{DS} = 75V
Q_{gd}	Gate-to-Drain Charge	—	26	—		V_{GS} = 10V④
Q_{sync}	Total Gate Charge Sync. (Q_g - Q_{gd})	—	51	—		I_D = 62A, V_{DS} =0V, V_{GS} = 10V
$t_{d(on)}$	Turn-On Delay Time	—	18	—	ns	V_{DD} = 98V
t_r	Rise Time	—	73	—		I_D = 62A
$t_{d(off)}$	Turn-Off Delay Time	—	41	—		R_G= 2.2Ω
t_f	Fall Time	—	39	—		V_{GS} = 10V⑤
C_{iss}	Input Capacitance	—	5270	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	490	—		V_{DS} = 50V
C_{rss}	Reverse Transfer Capacitance	—	105	—		f = 1.0MHz, See Fig. 5
$C_{oss\ eff.(ER)}$	Effective Output Capacitance (Energy Related)	—	460	—		V_{GS} = 0V, V_{DS} = 0V to 120V⑥
$C_{oss\ eff.(TR)}$	Effective Output Capacitance (Time Related)	—	530	—		V_{GS} = 0V, V_{DS} = 0V to 120V⑤

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	104	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	420		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J = 25°C,I_S = 62A,V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	—	86	—	ns	T_J = 25°C V_{DD} = 130V
		—	110	—		T_J = 125°C I_F = 62A,
Q_{rr}	Reverse Recovery Charge	—	300	—	nC	T_J = 25°C di/dt = 100A/µs ④
		—	450	—		T_J = 125°C
I_{RRM}	Reverse Recovery Current	—	6.5	—	A	T_J = 25°C

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

② Recommended max EAS limit, Limited by T_{Jmax}, starting T_J = 25°C, L = 0.17mH, R_G = 25Ω, I_{AS} = 100A, V_{GS} =15V.

③ $I_{SD} \le$ 62A, di/dt ≤ 1040A/µs, $V_{DD} \le V_{(BR)DSS}$, $T_J \le$ 175°C.

④ Pulse width ≤ 400µs; duty cycle ≤ 2%.

⑤ C_{oss} eff. (TR) is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS}.

⑥ C_{oss} eff. (ER) is a fixed capacitance that gives the same energy as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS}.

⑦ when mounted on 1" square PCB (FR-4 or G-10 Material). For recommended footprint and soldering techniques refer to application note# AN-994.

⑧ R_θ is measured at T_J approximately 90°C.

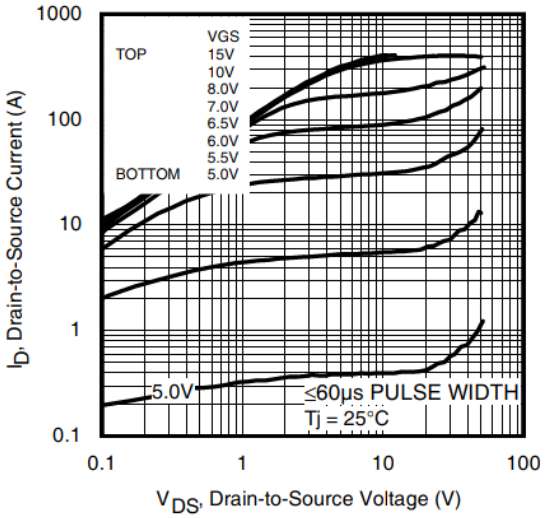


Fig. 1 Typical Output Characteristics

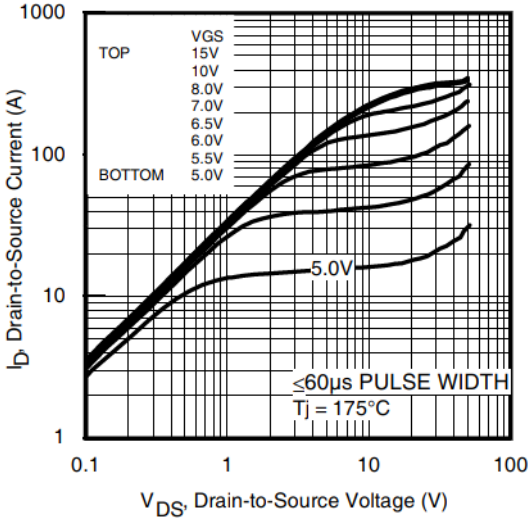


Fig. 2 Typical Output Characteristics

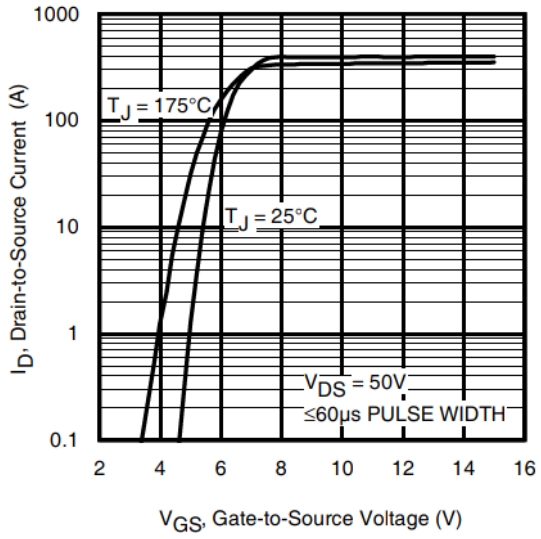


Fig. 3 Typical Transfer Characteristics

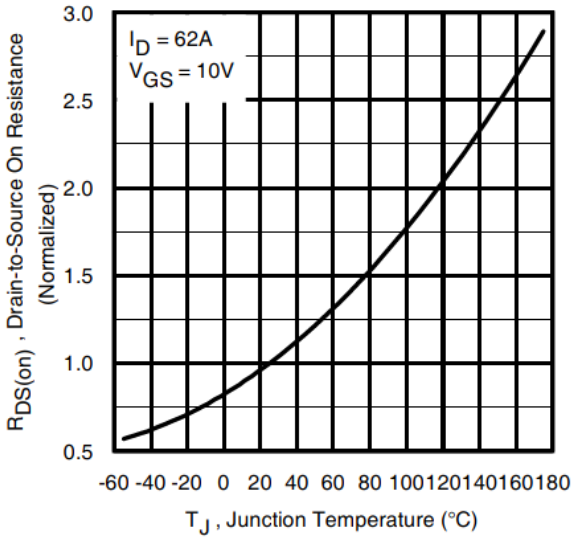


Fig. 4 Normalized On-Resistance vs. Temperature

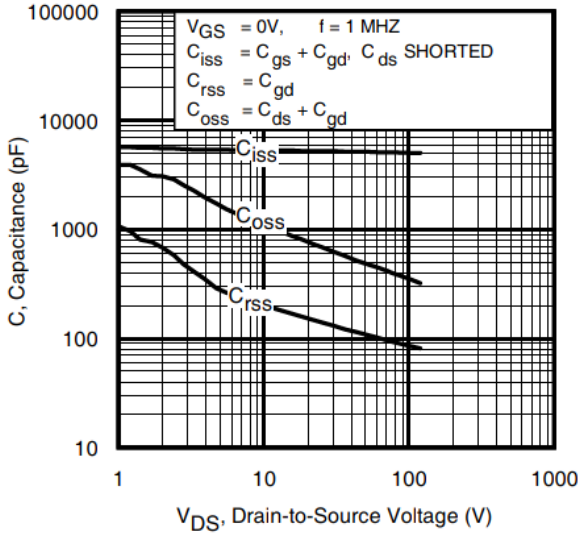


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

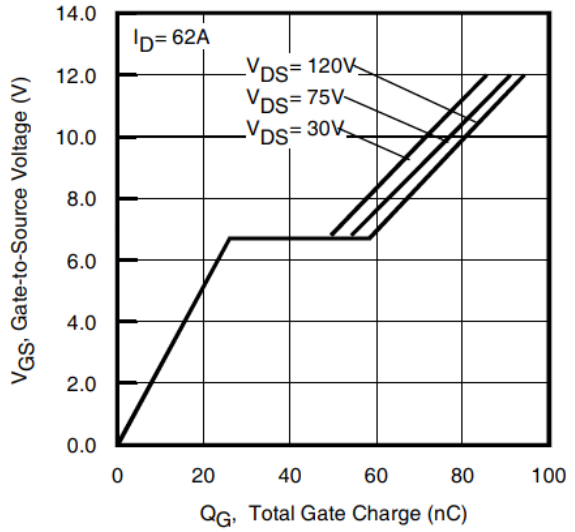


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

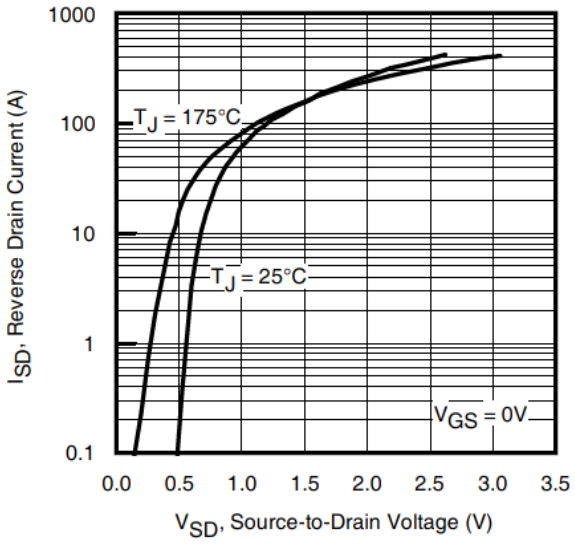


Fig. 7 Typical Source-to-Drain Diode Forward Voltage

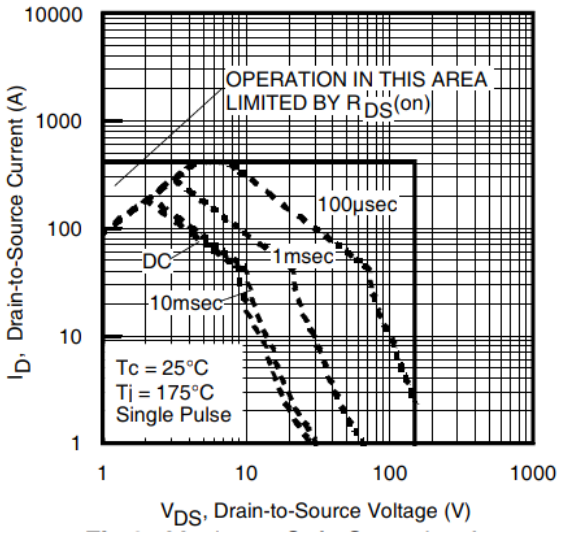


Fig 8. Maximum Safe Operating Area

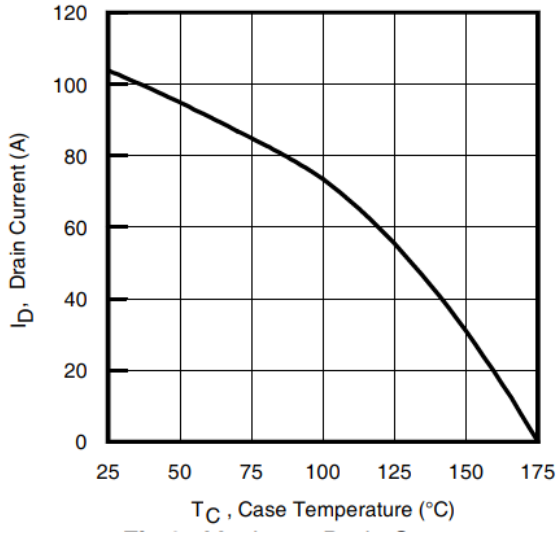


Fig 9. Maximum Drain Current vs. Case Temperature

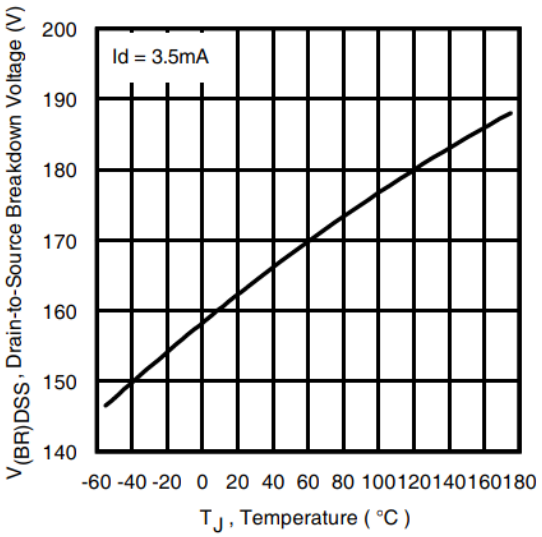


Fig 10. Drain-to-Source Breakdown Voltage

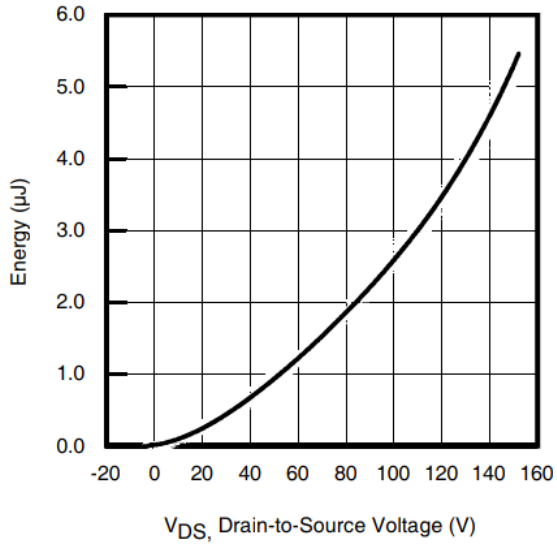


Fig 11. Typical Coss Stored Energy

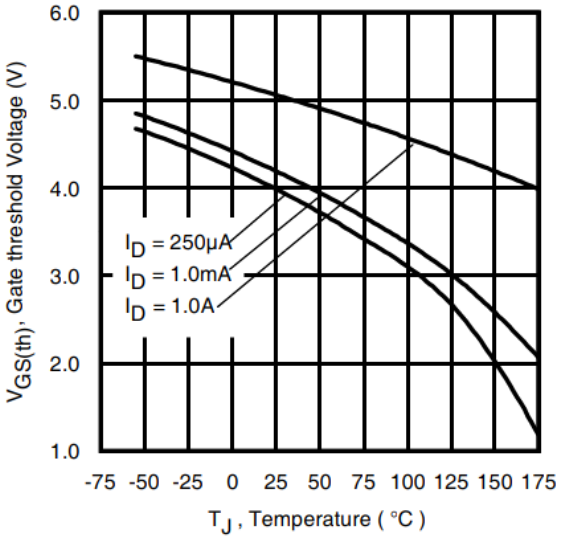


Fig 12. Threshold Voltage vs. Temperature

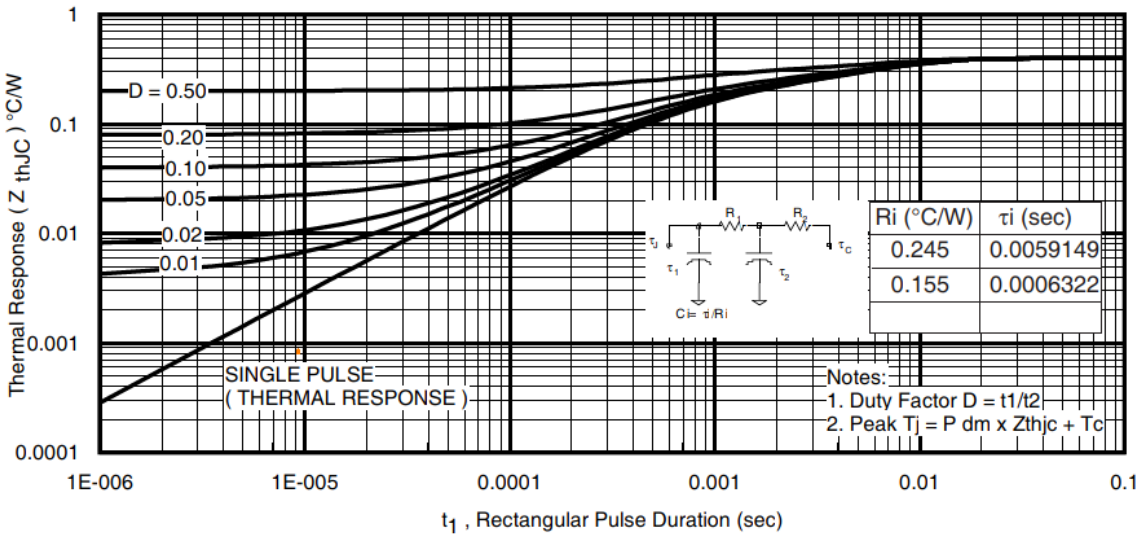


Fig 13. Maximum Effective Transient Thermal Impedance, Junction-to-Case

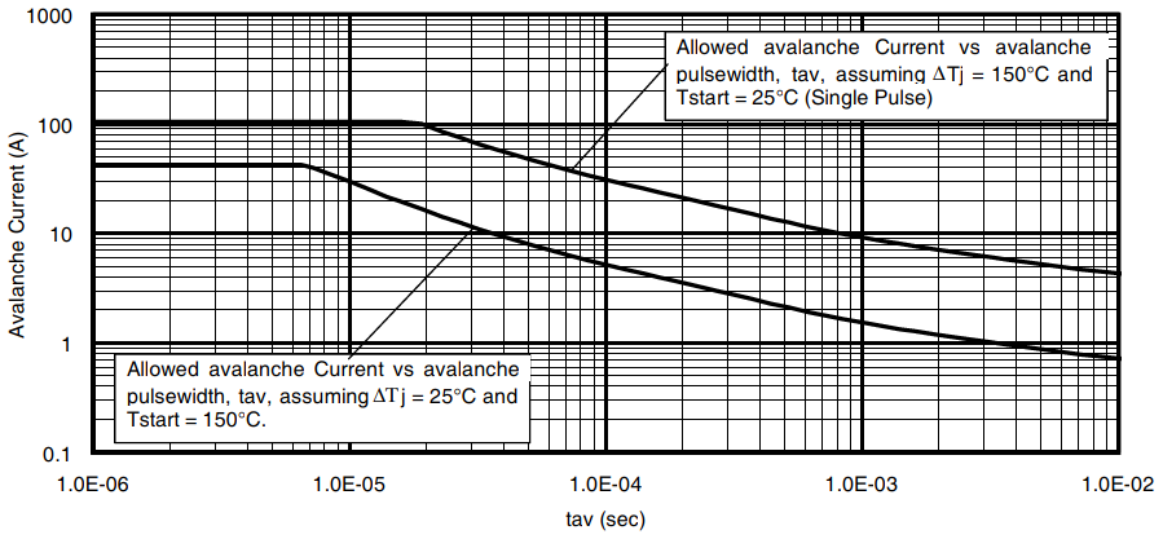


Fig 14. Avalanche Current vs. Pulse width

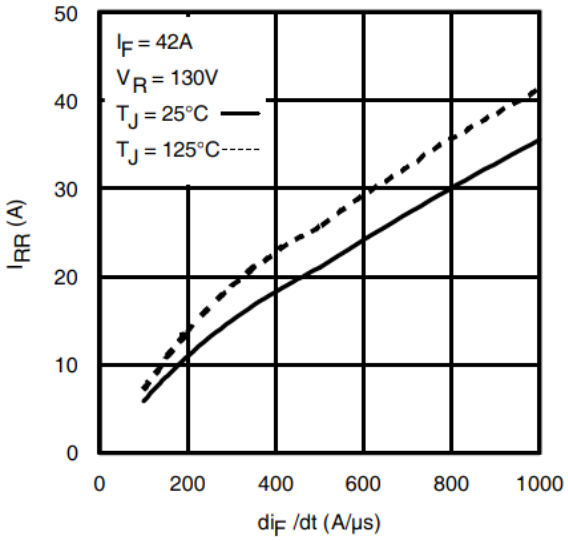


Fig 15. Typical Recovery Current vs. dif/dt

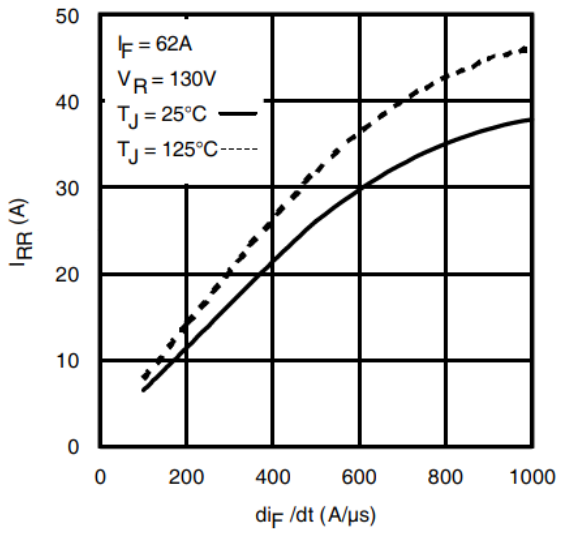


Fig. 16. - Typical Recovery Current vs. dif/dt

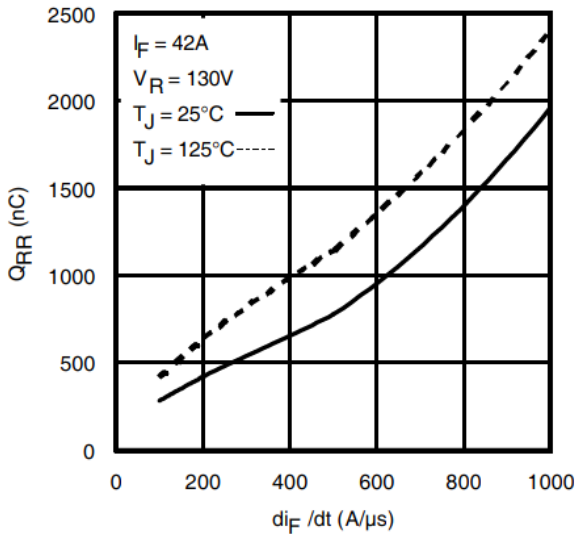


Fig. 17. - Typical Stored Charge vs. dif/dt

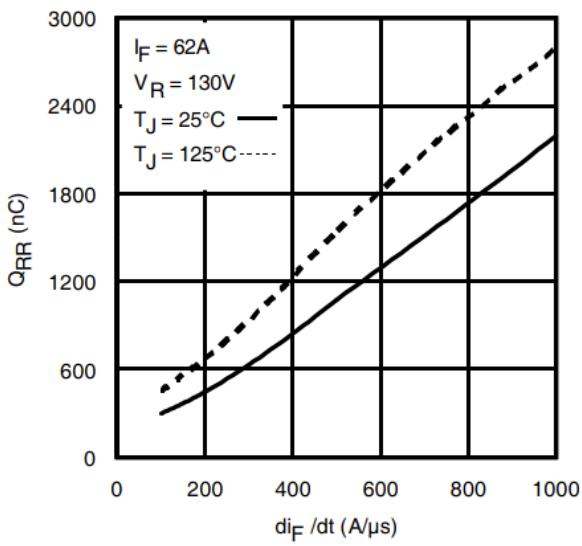


Fig. 18. - Typical Stored Charge vs. dif/dt

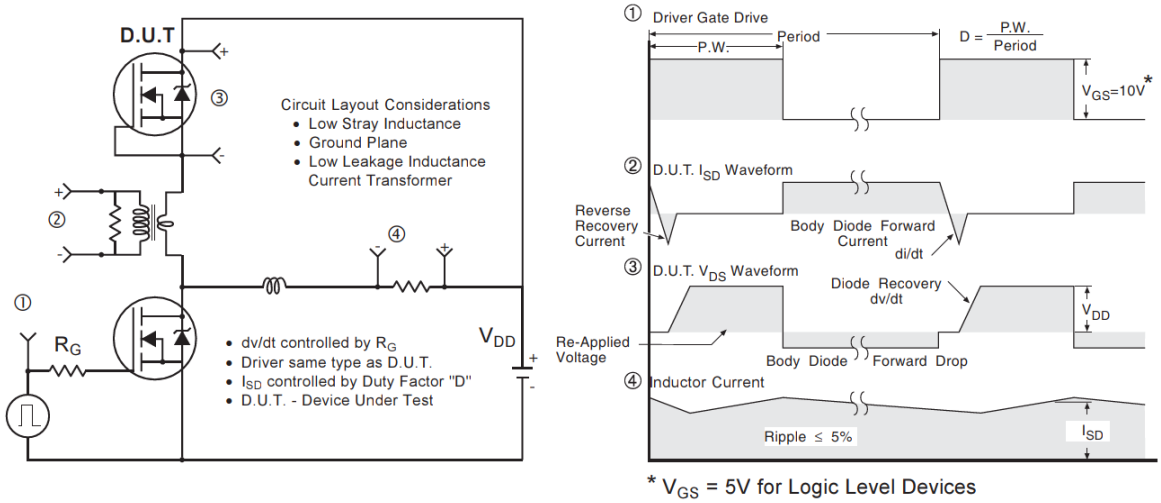


Fig 19. Peak Diode Recovery dv/dt Test Circuit for N-Channel HEXFET® Power MOSFETs

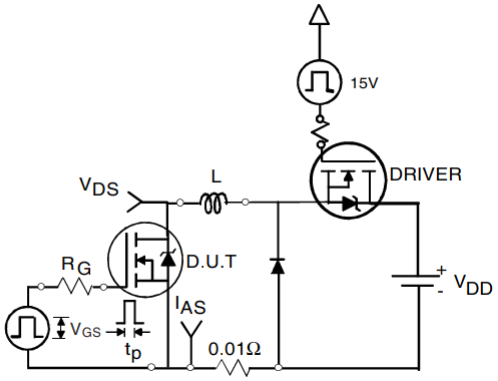


Fig 20a. Unclamped Inductive Test Circuit

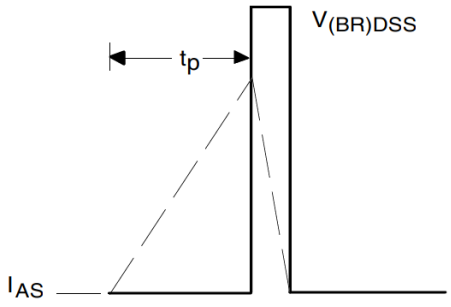


Fig 20b. Unclamped Inductive Waveforms

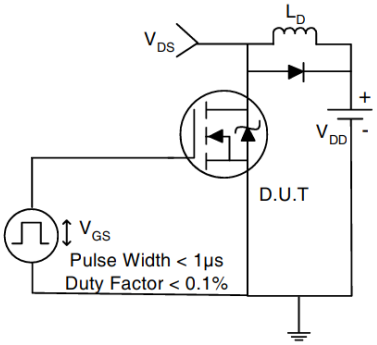


Fig 21a. Switching Time Test Circuit

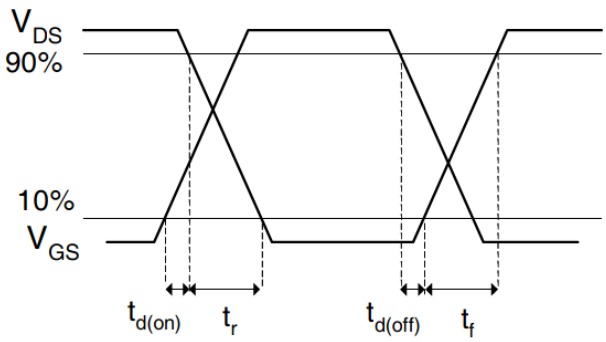


Fig 21b. Switching Time Waveforms

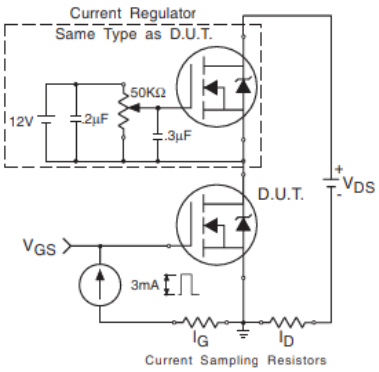


Fig 22a. Gate Charge Test Circuit

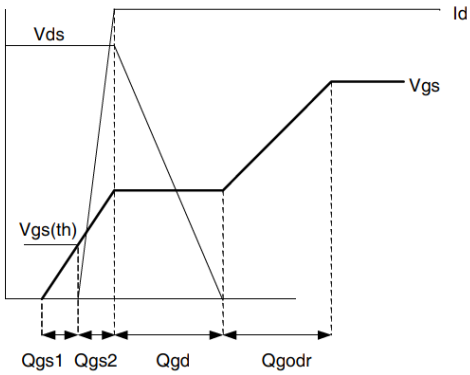
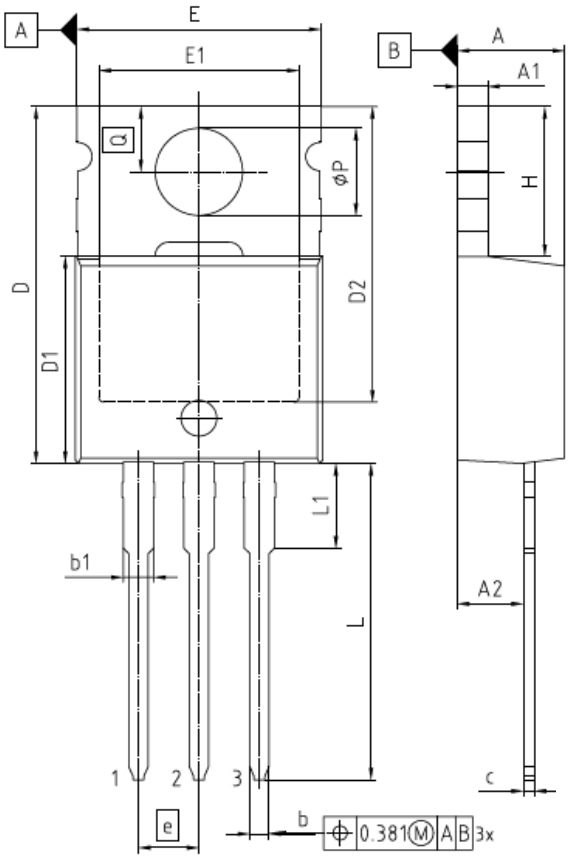


Fig 22b. Gate Charge Waveform

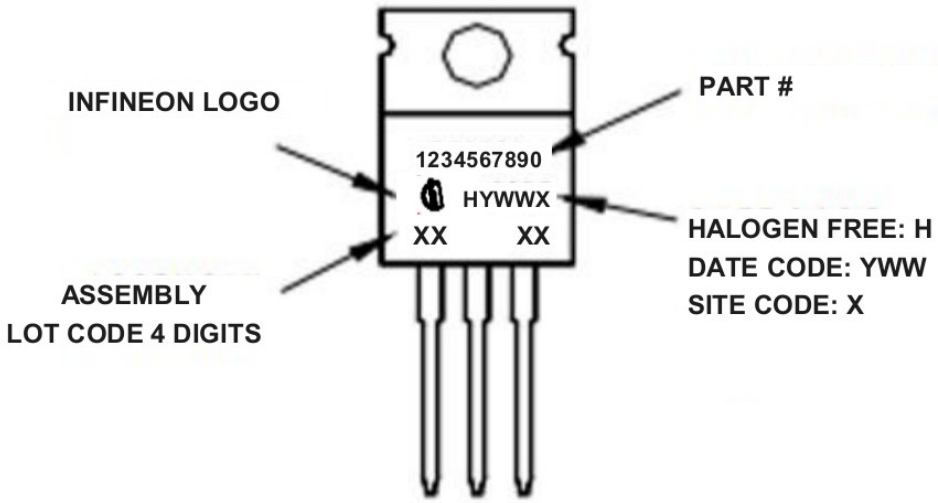
TO-220 Package Outline (Dimensions are shown in millimeters (inches))



NOTES:
DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSION OR GATE BURRS
GATE BURRS ARE LESS THAN 0.5 mm

PACKAGE - GROUP NUMBER:	PG-TO220-3-U05	
DIMENSIONS	MILLIMETERS	
	MIN.	MAX.
A	3.56	4.83
A1	1.14	1.40
A2	2.03	2.92
b	0.38	1.01
b1	1.14	1.78
c	0.36	0.61
D	14.22	16.51
D1	8.38	9.20
D2	11.68	12.88
E	9.65	10.67
E1	6.86	8.89
e	2.54	
N	3	
H	5.84	6.86
L	12.70	14.73
L1	3.56	4.06
øP	3.54	4.08
Q	2.54	3.42

TO-220 Part Marking Information



TO-220 packages are not recommended for Surface Mount Application.

Qualification Information†

Qualification Level	Industrial (per JEDEC JESD47F) ††	
Moisture Sensitivity Level	TO-220	N/A
RoHS Compliant	Yes	

† Qualification standards can be found at International Rectifier's web site: https://www.infineon.com/

†† Applicable version of JEDEC standard at the time of product release.

Revision History

Date	Rev.	Comments
2026-08-03	2.1	• Update datasheet to Infineon format • Updated Package Outline and Part marking –page 8 • Added disclaimer on last page.

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