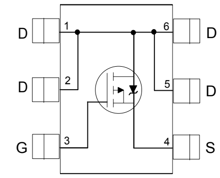
IRF5803PbF

HEXFET® Power MOSFET

V_{DSS}	$R_{DS(on)}$ (max)	I_D
- 40V	112mΩ @ V_{GS} = -10V	-3.4A
	190mΩ @ V_{GS} = -4.5V	-2.7A

- Ultra Low On-Resistance
- P-Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- Low Gate Charge
- Lead-Free
- Halogen-Free



Top View


TSOP-6
IRF5803PbF

G	D	S
Gate	Drain	Source

Description

These P-channel HEXFET® Power MOSFETs from International Rectifier utilize advanced processing techniques to achieve the extremely low on-resistance per silicon area. This benefit provides the designer with an extremely efficient device for use in battery and load management applications.

The TSOP-6 package with its customized lead frame produces a HEXFET® power MOSFET with RDS(on) 60% less than a similar size SOT-23. This package is ideal for applications where printed circuit board space is at a premium. It's unique thermal design and $R_{DS(on)}$ reduction enables a current-handling increase of nearly 300% compared to the SOT-23.

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRF5803PbF	TSOP-6	Tape and Reel	3000	IRF5803TRPbF

Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	-40	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ -10V	- 3.4	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ -10V	-2.7	
I_{DM}	Pulsed Drain Current ①	- 27	
P_D @T_A= 25°C	Maximum Power Dissipation ③	2.0	W
P_D @T_A= 70°C	Maximum Power Dissipation ③	1.3	
	Linear Derating Factor	16	mW/°C
V_{GS}	Gate-to-Source Voltage	± 20	
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

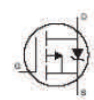
Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ③	——	62.5	°C/W

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-40	—	—	V	V_{GS} = 0V, I_D = -250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	-0.03	—	V/°C	Reference to 25°C, I_D = -1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	112	mΩ	V_{GS} = -10V, I_D = -3.4A
		—	—	190		V_{GS} = -4.5V, I_D = -2.7A
$V_{GS(th)}$	Gate Threshold Voltage	-1.0	—	- 3.0	V	V_{DS} = V_{GS}, I_D = -250μA
gfs	Forward Trans conductance	4.0	—	—	S	V_{DS} = -10V, I_D = -3.4A
I_{DSS}	Drain-to-Source Leakage Current	—	—	-10	μA	V_{DS} = -32V, V_{GS} = 0V
		—	—	-25		V_{DS} = -32V,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
Q_g	Total Gate Charge	—	25	37	nC	I_D = -3.4A
Q_{gs}	Gate-to-Source Charge	—	4.5	6.8		V_{DS} = -20V
Q_{gd}	Gate-to-Drain ('Miller') Charge	—	3.5	5.3		V_{GS} = -10V
$t_{d(on)}$	Turn-On Delay Time	—	43	—	ns	V_{DD} = -20V②
t_r	Rise Time	—	550	—		I_D = -1.0A
$t_{d(off)}$	Turn-Off Delay Time	—	88	—		R_G = 6.0Ω
t_f	Fall Time	—	50	—		V_{GS} = -10V
C_{iss}	Input Capacitance	—	1110	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	93	—		V_{DS} = -25V
C_{rss}	Reverse Transfer Capacitance	—	73	—		f = 100KHz

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-2.0	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	-27		
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	T_J = 25°C,I_S = -2.0A,V_{GS} = 0V ②
t_{rr}	Reverse Recovery Time	—	27	40	ns	T_J = 25°C ,I_F = -2.0A
Q_{rr}	Reverse Recovery Charge	—	34	50	nC	di/dt = 100A/μs ②

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.
② Pulse width ≤ 400μs; duty cycle ≤ 2%.
③ Surface mounted on 1 in square Cu board

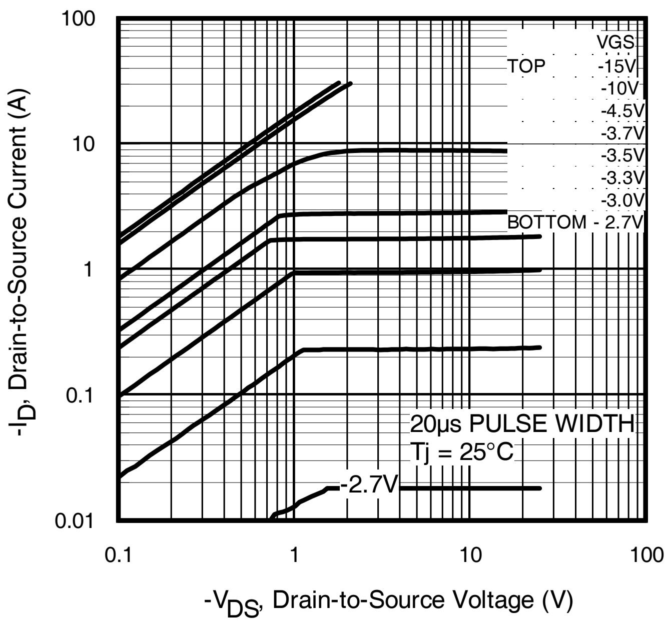


Fig. 1 Typical Output Characteristics

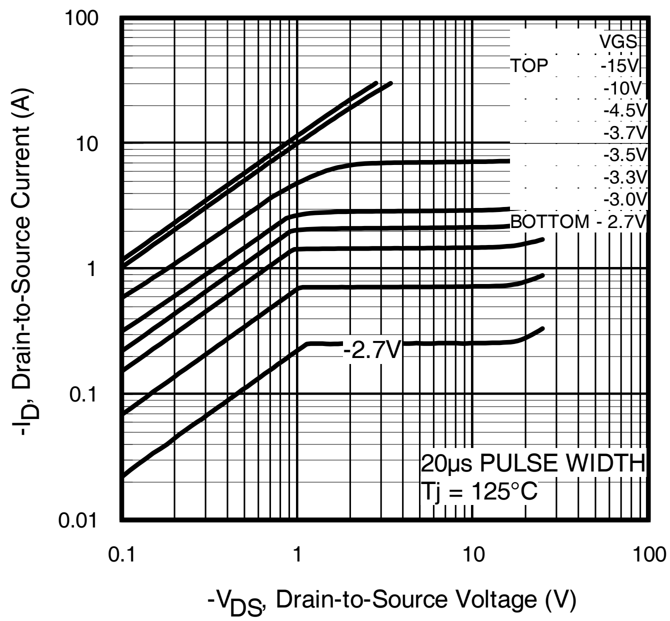


Fig. 2 Typical Output Characteristics

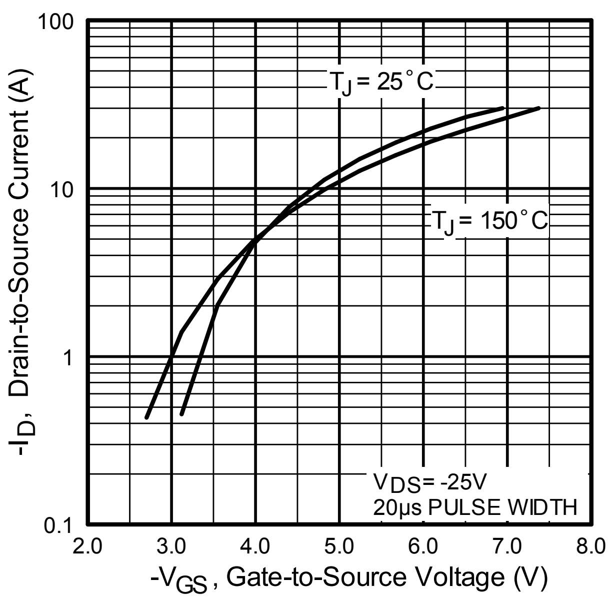


Fig. 3 Typical Transfer Characteristics

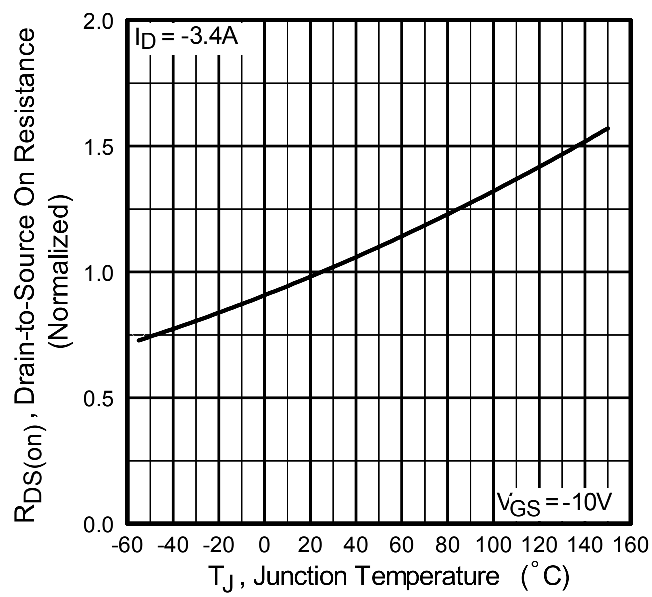


Fig. 4 Normalized On-Resistance vs. Temperature

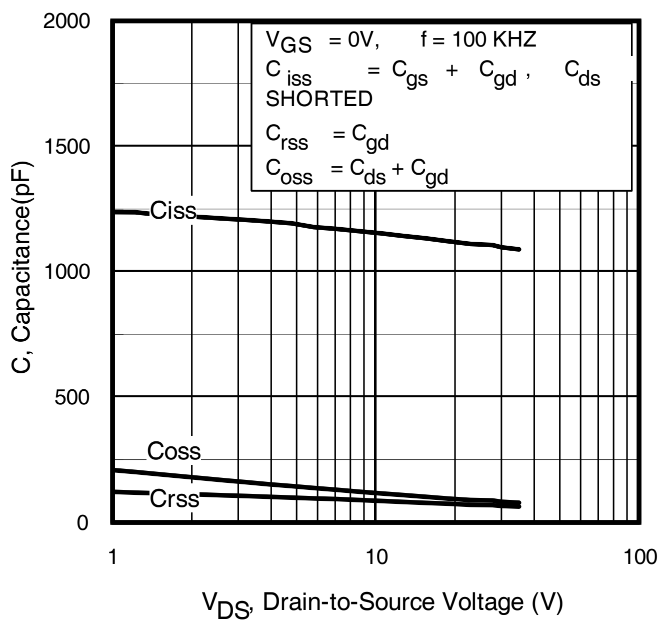


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

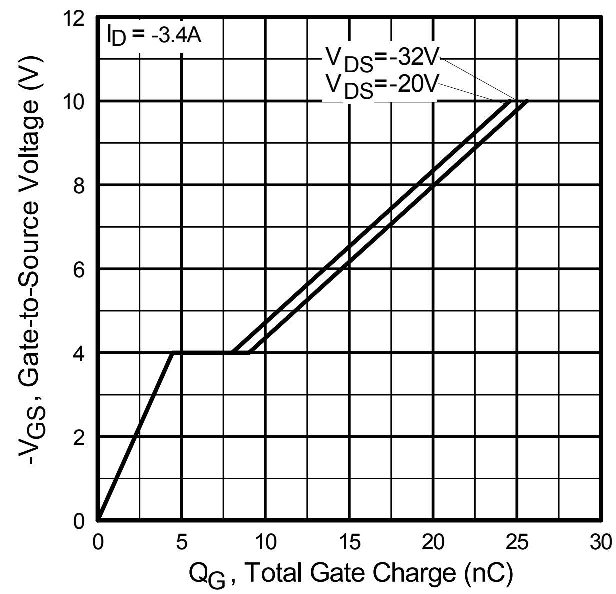


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

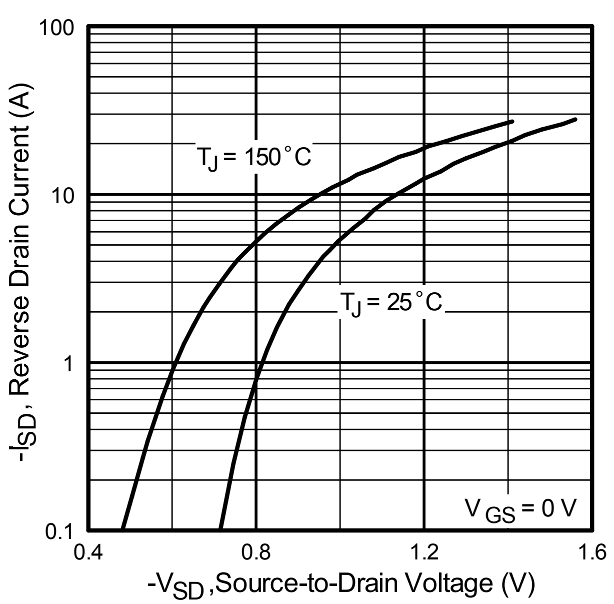


Fig. 7 Typical Source-to-Drain Diode Forward Voltage

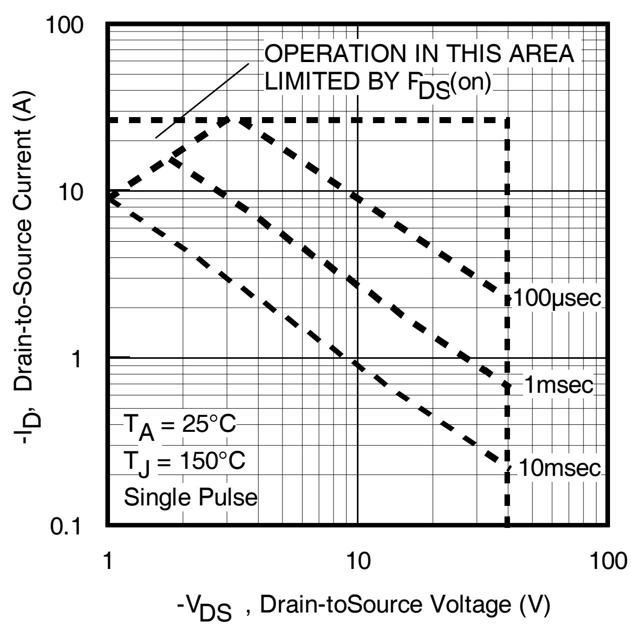


Fig 8. Maximum Safe Operating Area

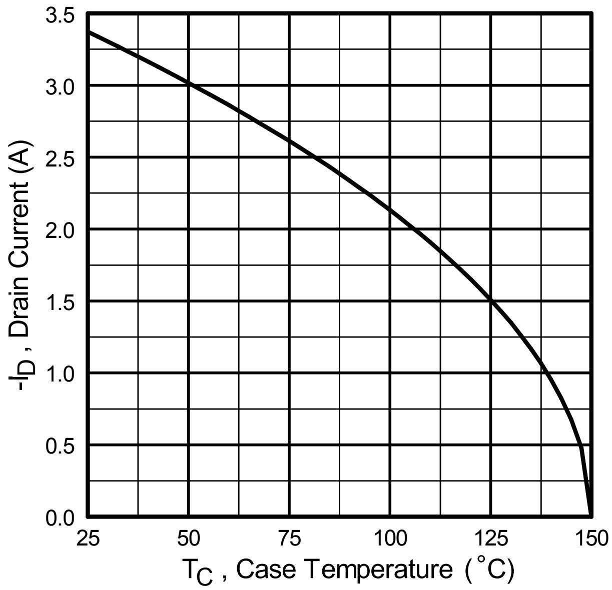


Fig 9. Maximum Drain Current vs. Case Temperature

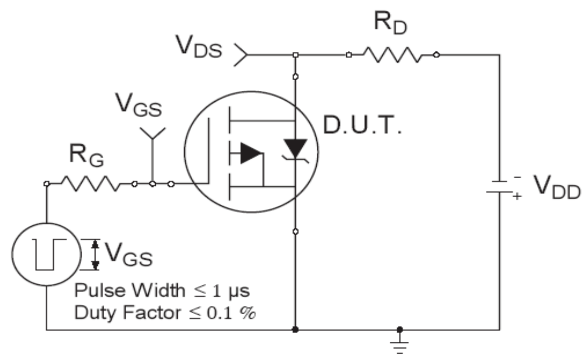


Fig 10a. Switching Time Test Circuit

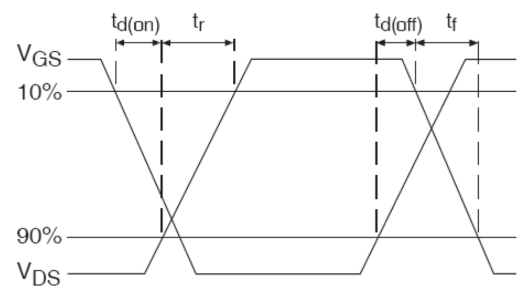


Fig 10b. Switching Time Waveforms

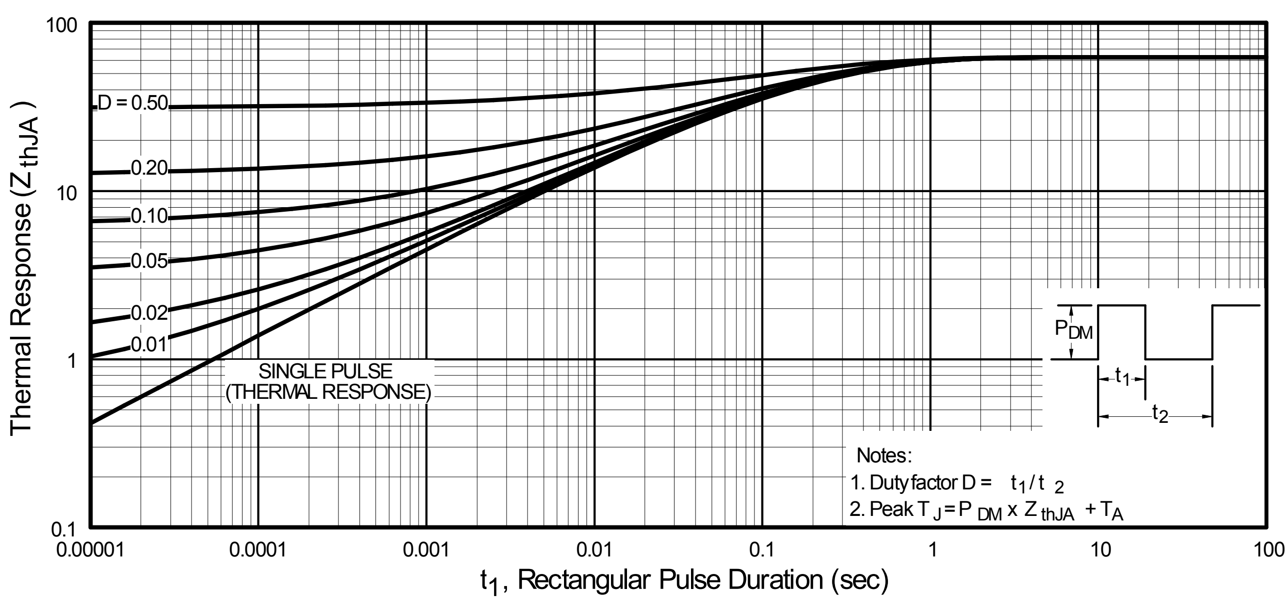


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

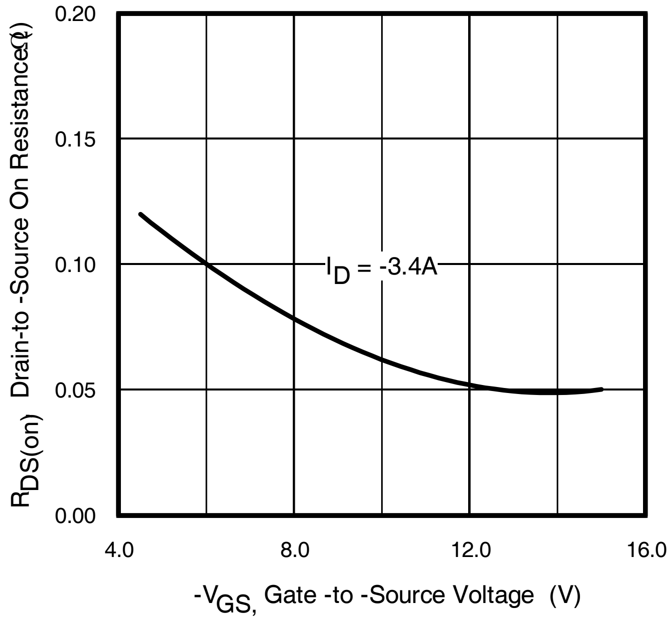


Fig 12. Typical On-Resistance Vs. Gate Voltage

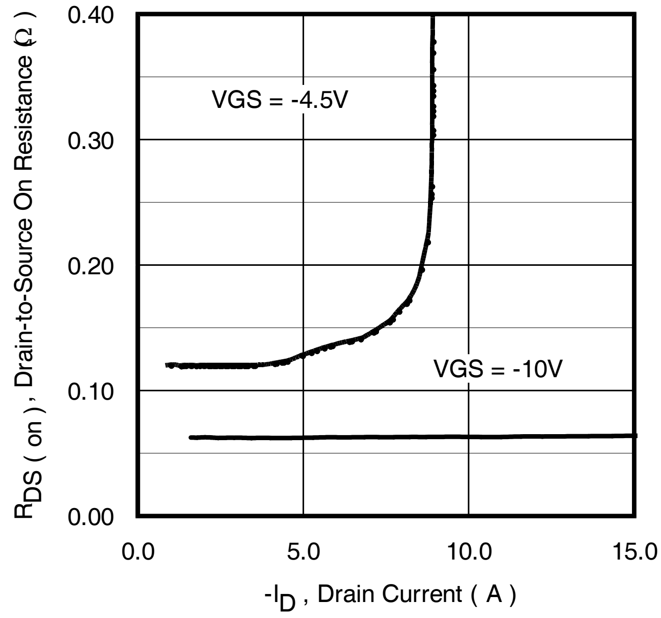


Fig 13. Typical On-Resistance Vs. Drain Current

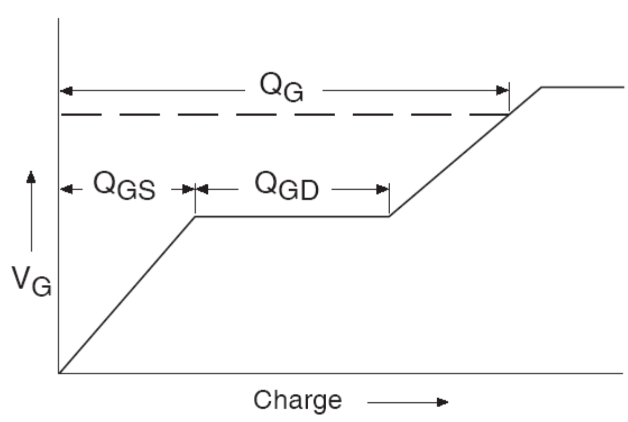


Fig 14a. Basic Gate Charge Waveform

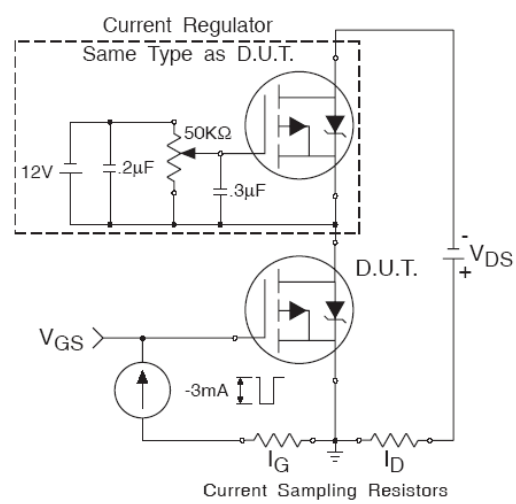


Fig 14b. Gate Charge Test Circuit

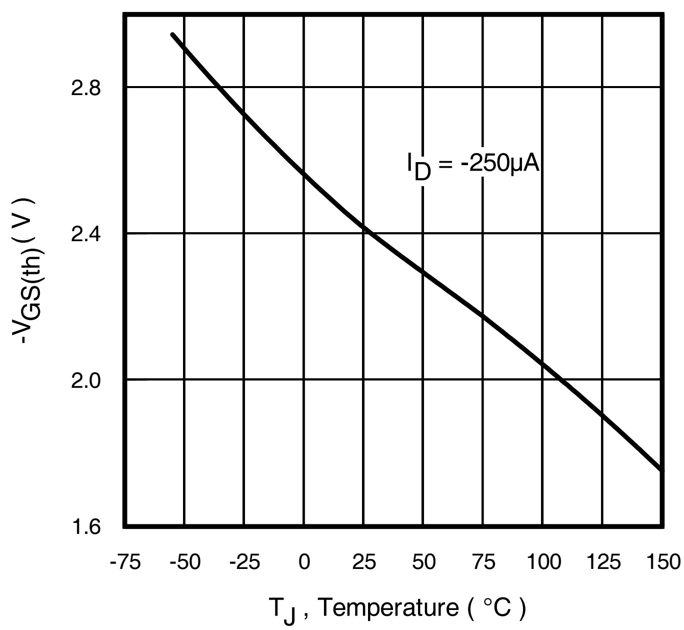


Fig 15. Typical Threshold Voltage Vs. Junction Temperature

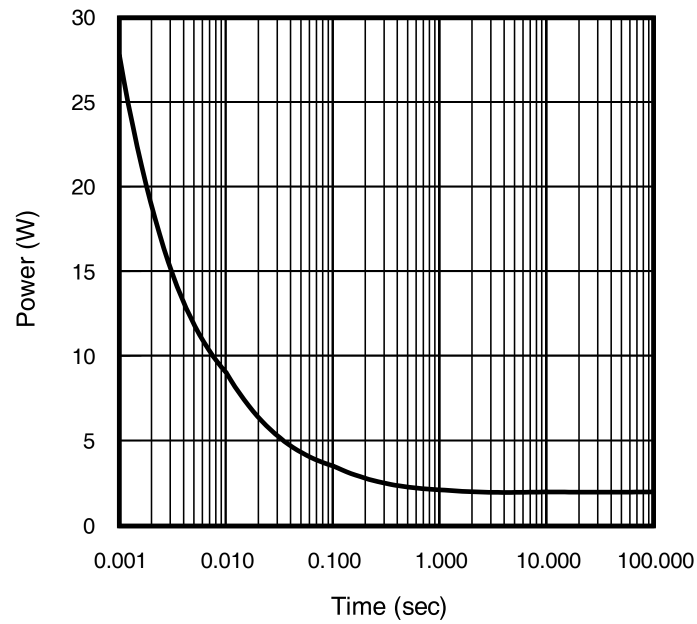
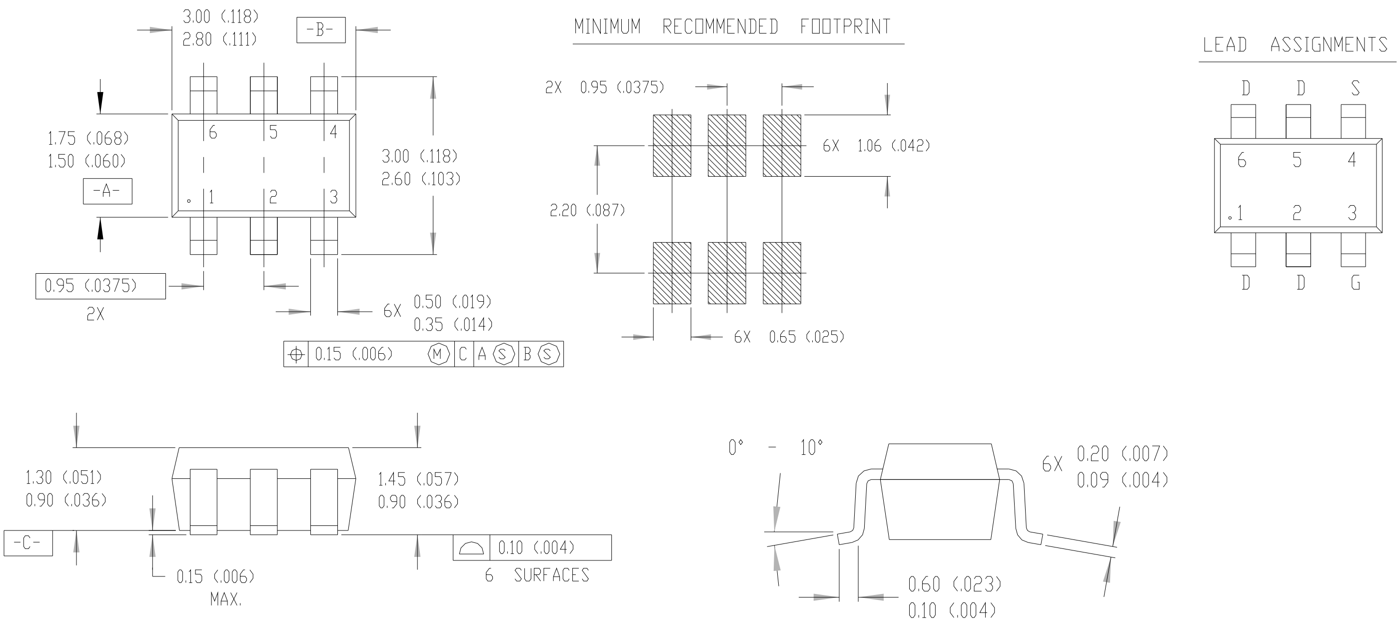
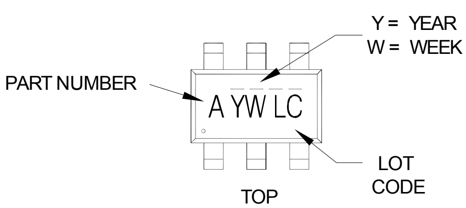


Fig 16. Typical Power Vs. Time

TSOP-6 Package Outline



TSOP-6 Part Marking Information



PART NUMBER CODE REFERENCE:

A = SI3443DV
B = IRF5800
C = IRF5850
D = IRF5851
E = IRF5852
F = IRF5801
G = IRF5803
H = IRF5804
I = IRF5805
J = IRF5806
K = IRF5810
N = IRF5802
O = IRLTS6342TRPBF
P = IRFTS8342TRPBF
R = IRFTS9342TRPBF
S = Not applicable
T = IRLTS2242TRPBF

Note: A line above the work week
(as shown here) indicates Lead-Free.

DATE CODE MARKING INSTRUCTIONS

WW = (1-26) IF PRECEDED BY LAST DIGIT OF CALENDAR YEAR

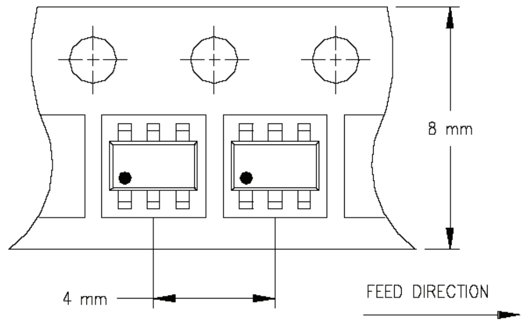
YEAR		Y	WORK WEEK	W
2011	2001	1	01	A
2012	2002	2	02	B
2013	2003	3	03	C
2014	2004	4	04	D
2015	2005	5		
2016	2006	6	↓	↓
2017	2007	7		
2018	2008	8		
2019	2009	9		
2020	2010	0	24	X
			25	Y
			26	Z

WW = (27-52) IF PRECEDED BY A LETTER

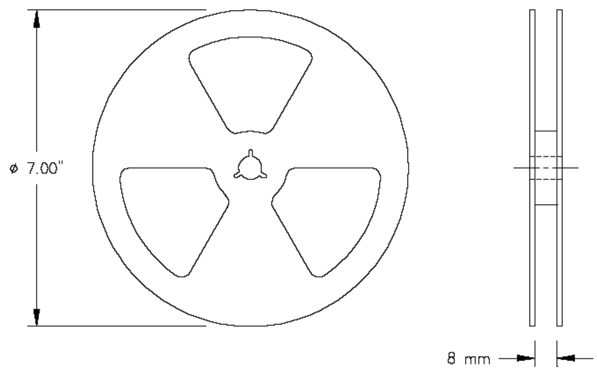
YEAR		Y	WORK WEEK	W
2011	2001	A	27	A
2012	2002	B	28	B
2013	2003	C	29	C
2014	2004	D	30	D
2015	2005	E		
2016	2006	F	↓	↓
2017	2007	G		
2018	2008	H		
2019	2009	J		
2020	2010	K	50	X
			51	Y
			52	Z

Note: For the most current drawing please refer to Infineon's web site www.infineon.com

TSOP-6 Tape & Reel Information



NOTES:
1. OUTLINE CONFORMS TO EIA-481 & EIA-541.



NOTES:
1. OUTLINE CONFORMS TO EIA-481 & EIA-541.

Note: For the most current drawing please refer to Infineon's web site www.infineon.com

Qualification Information

Qualification Level	Consumer (per JEDEC JESD47F) †	
Moisture Sensitivity Level	TSOP-6	MSL1 (per JEDEC J-STD-020D) †
RoHS Compliant	Yes	

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

Revision History

Date	Comments
01/27/2017	• Changed datasheet with Infineon logo-all pages • Updated package outline and part marking on page 8. • Added disclaimer on last page.

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Document reference
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