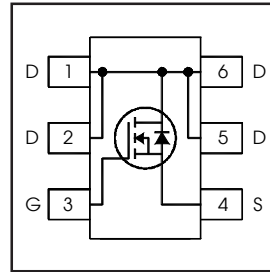


HEXFET® Power MOSFET

$V_{DS}$	<b>200</b>	<b>V</b>
$R_{DS(on) max}$ (@ $V_{GS} = 10V$ )	<b>2.20</b>	$\Omega$
$Q_g$ (typical)	<b>3.9</b>	<b>nC</b>
$I_D$ (@ $T_A = 25^\circ C$ )	<b>0.6</b>	<b>A</b>



**Features**

Industry-standard pinout TSOP-6 Package
Compatible with Existing Surface Mount Techniques
RoHS Compliant, Halogen-Free
MSL1, Industrial qualification



**Benefits**

Multi-Vendor Compatibility
Easier Manufacturing
Environmentally Friendlier
Increased Reliability

Base Part Number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRF5801TRPbF-1	TSOP-6	Tape and Reel	3000	IRF5801TRPbF-1

**Absolute Maximum Ratings**

	Parameter	Max.	Units
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	0.6	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	0.48	
$I_{DM}$	Pulsed Drain Current ①	4.8	
$P_D @ T_A = 25^\circ C$	Power Dissipation	2.0	W
	Linear Derating Factor	0.016	W/°C
$V_{GS}$	Gate-to-Source Voltage	$\pm 30$	V
$dv/dt$	Peak Diode Recovery $dv/dt$ ②	9.6	V/ns
$T_J$ $T_{STG}$	Operating Junction and Storage Temperature Range	-55 to + 150	°C
	Soldering Temperature, for 10 seconds	300 (1.6mm from case )	

**Thermal Resistance**

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ④	—	62.5	°C/W

Notes ① through ⑥ are on page 8

**Static @ T<sub>J</sub> = 25°C (unless otherwise specified)**

	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)DSS</sub>	Drain-to-Source Breakdown Voltage	200	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
ΔV <sub>(BR)DSS/ΔT<sub>J</sub></sub>	Breakdown Voltage Temp. Coefficient	—	0.26	—	V/°C	Reference to 25°C, I <sub>D</sub> = 1mA ③
R <sub>DS(on)</sub>	Static Drain-to-Source On-Resistance	—	—	2.2	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 0.36A ③
V <sub>GS(th)</sub>	Gate Threshold Voltage	3.0	—	5.5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
I <sub>DSS</sub>	Drain-to-Source Leakage Current	—	—	25	μA	V <sub>DS</sub> = 200V, V <sub>GS</sub> = 0V
		—	—	250		V <sub>DS</sub> = 160V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 150°C
I <sub>GSS</sub>	Gate-to-Source Forward Leakage	—	—	100	nA	V <sub>GS</sub> = 30V
	Gate-to-Source Reverse Leakage	—	—	-100		V <sub>GS</sub> = -30V

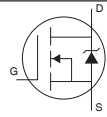
**Dynamic @ T<sub>J</sub> = 25°C (unless otherwise specified)**

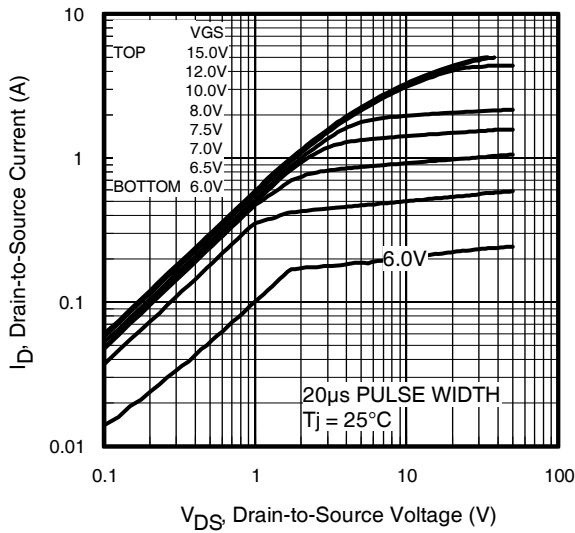
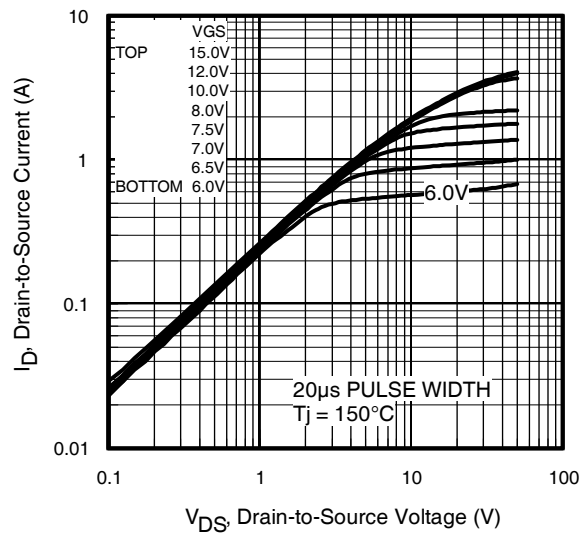
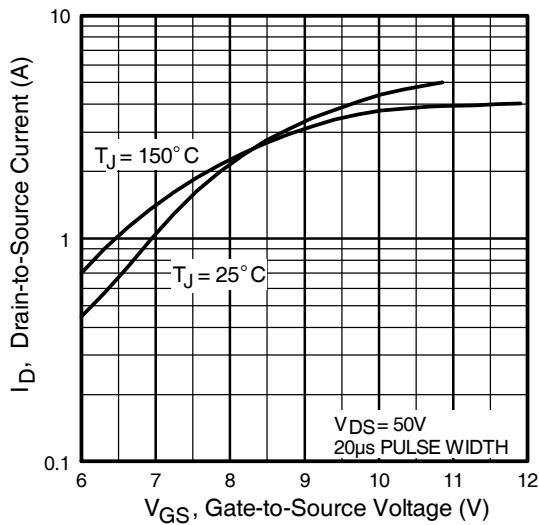
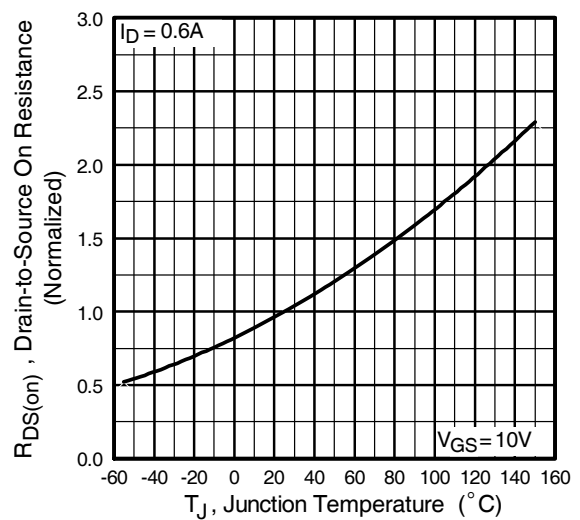
	Parameter	Min.	Typ.	Max.	Units	Conditions
g <sub>fs</sub>	Forward Transconductance	0.44	—	—	S	V <sub>DS</sub> = 50V, I <sub>D</sub> = 0.36A
Q <sub>g</sub>	Total Gate Charge	—	3.9	—	nC	I <sub>D</sub> = 0.36A V <sub>DS</sub> = 160V V <sub>GS</sub> = 10V
Q <sub>gs</sub>	Gate-to-Source Charge	—	0.8	—		
Q <sub>gd</sub>	Gate-to-Drain ("Miller") Charge	—	2.2	—		
t <sub>d(on)</sub>	Turn-On Delay Time	—	6.5	—	ns	V <sub>DD</sub> = 100V I <sub>D</sub> = 0.36A R <sub>G</sub> = 53Ω V <sub>GS</sub> = 10V ③
t <sub>r</sub>	Rise Time	—	8.0	—		
t <sub>d(off)</sub>	Turn-Off Delay Time	—	8.8	—		
t <sub>f</sub>	Fall Time	—	19	—		
C <sub>iss</sub>	Input Capacitance	—	88	—	pF	V <sub>GS</sub> = 0V V <sub>DS</sub> = 25V f = 1.0MHz V <sub>GS</sub> = 0V, V <sub>DS</sub> = 1.0V, f = 1.0MHz V <sub>GS</sub> = 0V, V <sub>DS</sub> = 160V, f = 1.0MHz V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V to 160V ③
C <sub>oss</sub>	Output Capacitance	—	18	—		
C <sub>rss</sub>	Reverse Transfer Capacitance	—	6.3	—		
C <sub>oss</sub>	Output Capacitance	—	102	—		
C <sub>oss</sub>	Output Capacitance	—	8.4	—		
C <sub>oss eff.</sub>	Effective Output Capacitance	—	26	—		

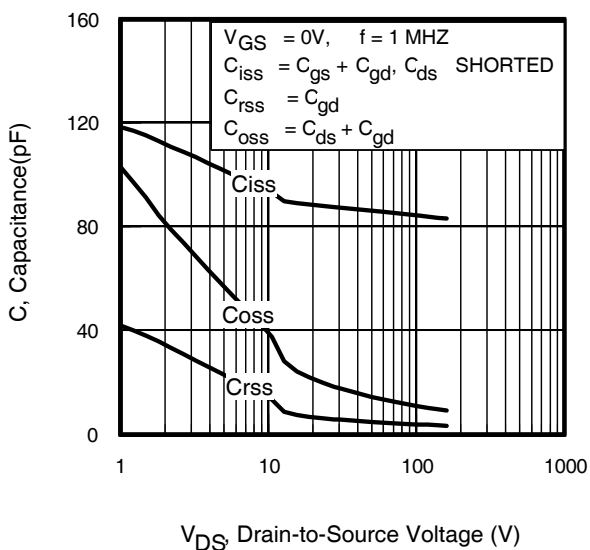
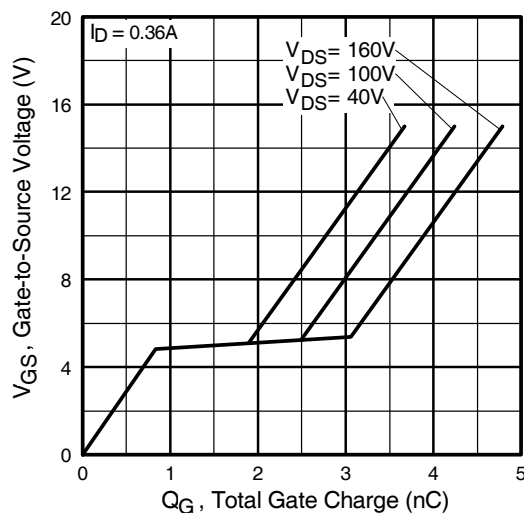
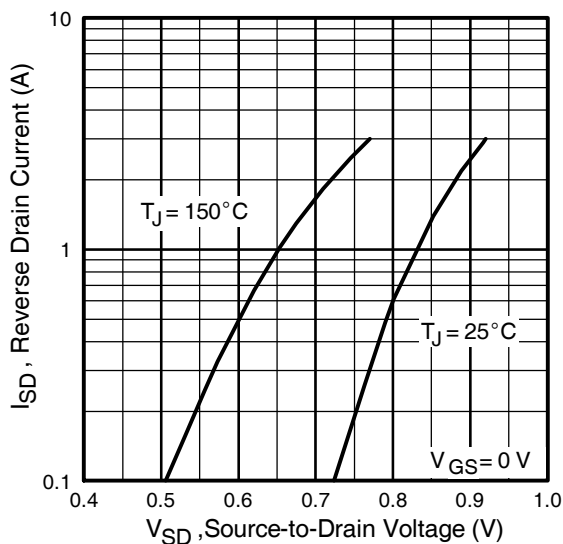
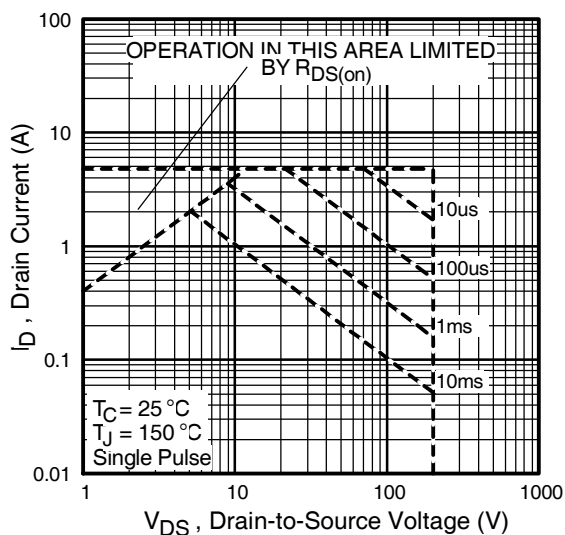
**Avalanche Characteristics**

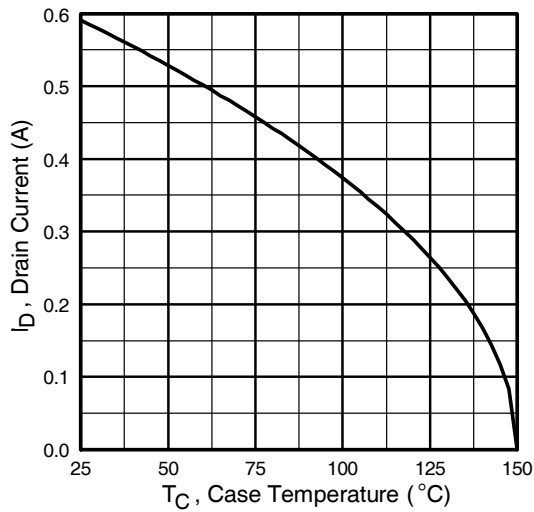
	Parameter	Typ.	Max.	Units
E <sub>AS</sub>	Single Pulse Avalanche Energy②	—	9.9	mJ
I <sub>AR</sub>	Avalanche Current①	—	0.6	A

**Diode Characteristics**

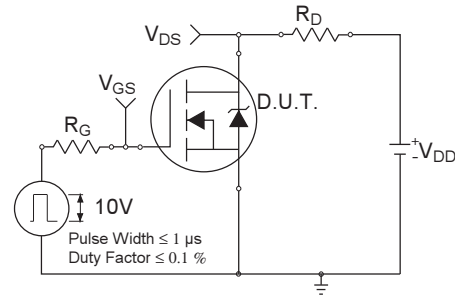
	Parameter	Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	—	—	1.8	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I <sub>SM</sub>	Pulsed Source Current (Body Diode) ①	—	—	4.8		
V <sub>SD</sub>	Diode Forward Voltage	—	—	1.3	V	T <sub>J</sub> = 25°C, I <sub>S</sub> = 0.36A, V <sub>GS</sub> = 0V ③
t <sub>rr</sub>	Reverse Recovery Time	—	45	—	ns	T <sub>J</sub> = 25°C, I <sub>F</sub> = 0.36A
Q <sub>rr</sub>	Reverse Recovery Charge	—	54	—	nC	di/dt = 100A/μs ③


**Fig 1. Typical Output Characteristics**

**Fig 2. Typical Output Characteristics**

**Fig 3. Typical Transfer Characteristics**

**Fig 4. Normalized On-Resistance Vs. Temperature**

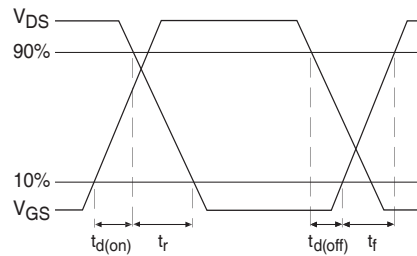

**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage

**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage

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

**Fig 8.** Maximum Safe Operating Area



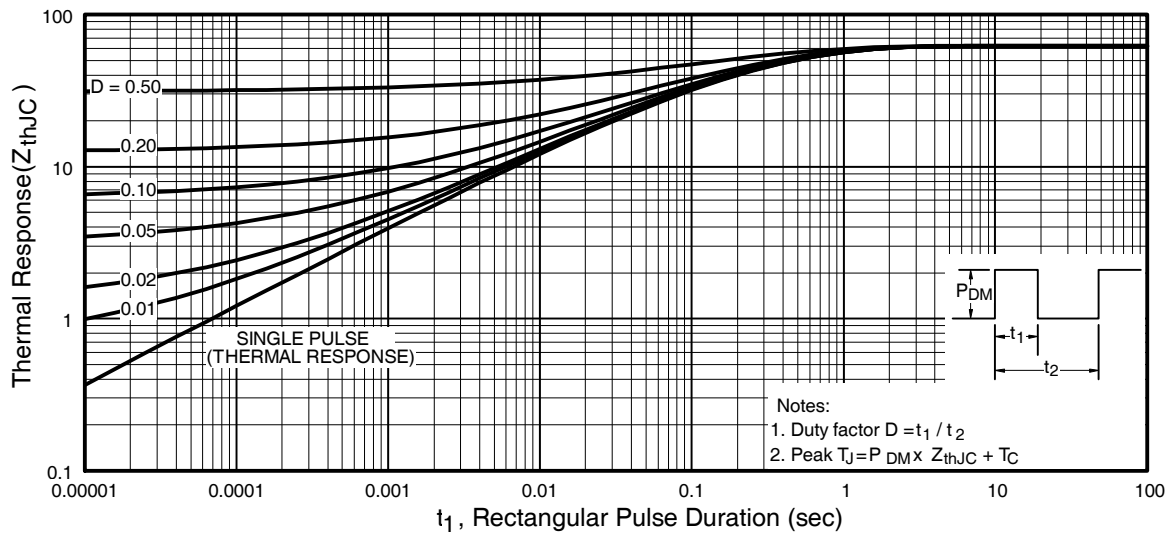
**Fig 9.** Maximum Drain Current Vs. Case Temperature



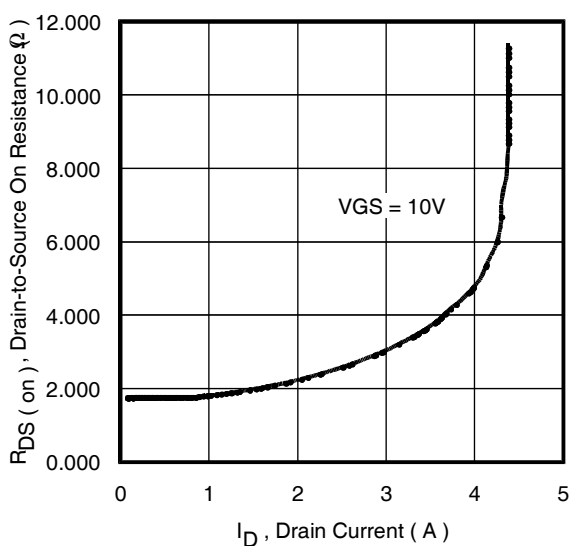
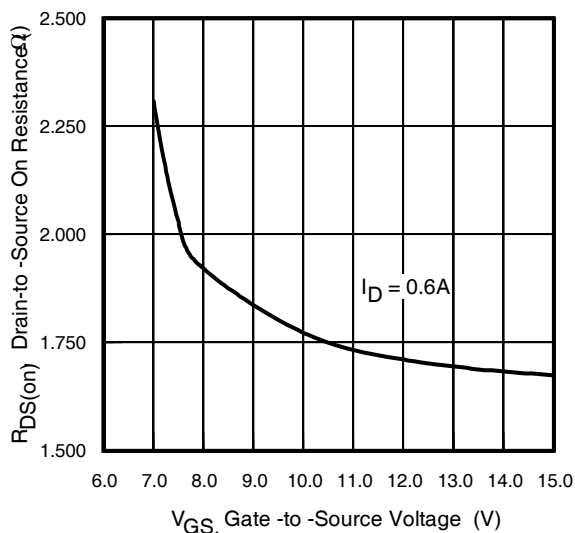
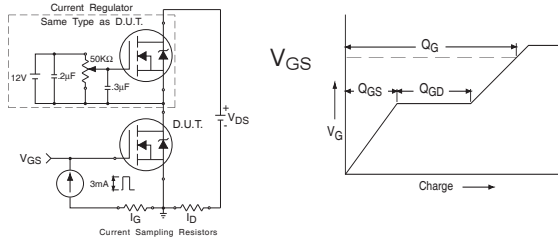
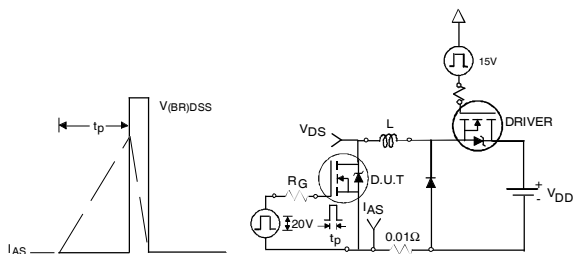
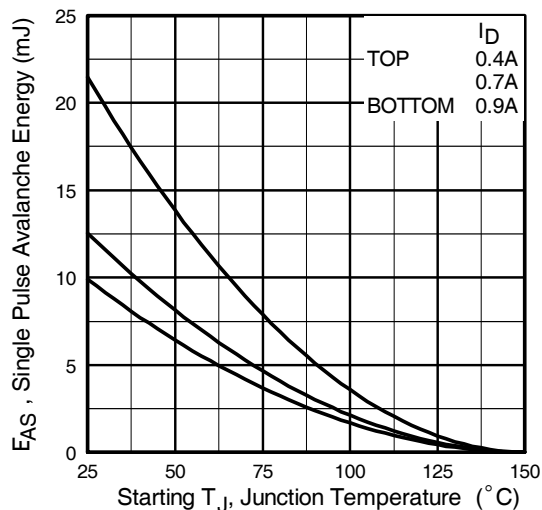
**Fig 10a.** Switching Time Test Circuit



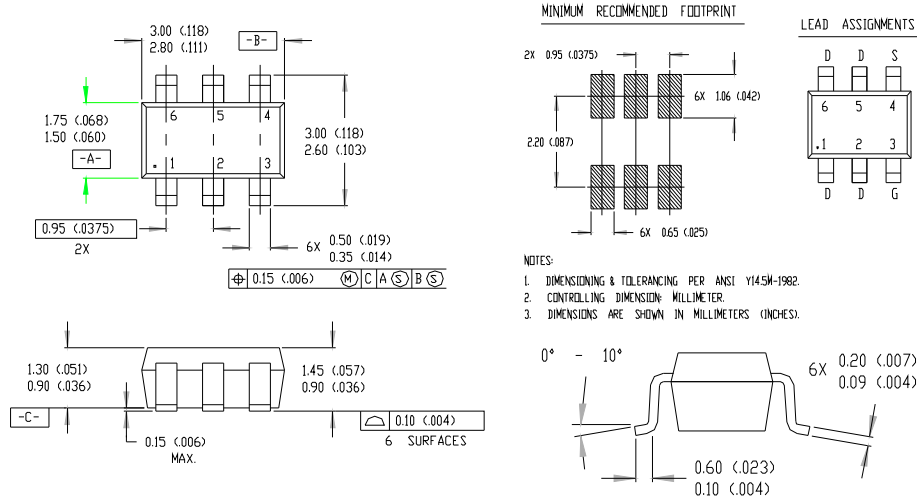
**Fig 10b.** Switching Time Waveforms



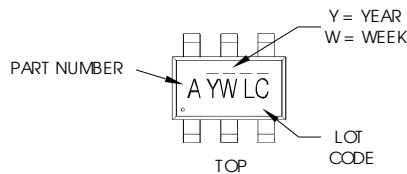
**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient


**Fig 12. On-Resistance Vs. Drain Current**

**Fig 13. On-Resistance Vs. Gate Voltage**

**Fig 14a&b. Basic Gate Charge Test Circuit and Waveform**

**Fig 15a&b. Unclamped Inductive Test circuit and Waveforms**

**Fig 15c. Maximum Avalanche Energy Vs. Drain Current**

## TSOP-6 Package Outline



## TSOP-6 Part Marking Information



### PART NUMBER CODE REFERENCE:

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

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

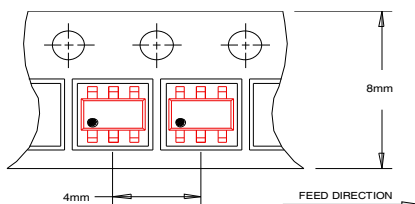
YEAR	Y	WCRK WEEK	W
2011	2001	1 01	A
2012	2002	2 02	B
2013	2003	3 03	C
2014	2004	4 04	D
2015	2005	5	
2016	2006	6	
2017	2007	7	
2018	2008	8	
2019	2009	9	
2020	2010	0 24	X
		25	Y
		26	Z

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

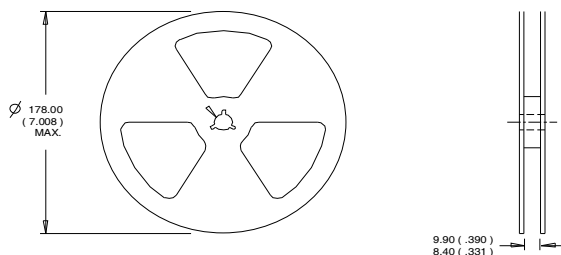
YEAR	Y	WCRK WEEK	W
2011	2001	A 27	A
2012	2002	B 28	B
2013	2003	C 29	C
2014	2004	D 30	D
2015	2005	E	
2016	2006	F	
2017	2007	G	
2018	2008	H	
2019	2009	J	
2020	2010	K 50	X
		51	Y
		52	Z

Note: For the most current drawing please refer to IR website at: <http://www.irf.com/package/>

## TSOP-6 Tape & Reel Information



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



NOTES:  
1. CONTROLLING DIMENSION : MILLIMETER.  
2. OUTLINE CONFORMS TO EIA-481 & EIA-541.

**Note:** For the most current drawing please refer to IR website at: <http://www.irf.com/package/>

### Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting  $T_J = 25^\circ\text{C}$ ,  $L = 27\text{mH}$ ,  $R_G = 25\Omega$ ,  $I_{AS} = 0.36\text{A}$ .
- ③ Pulse width  $\leq 400\mu\text{s}$ ; duty cycle  $\leq 2\%$ .
- ④ When mounted on 1 inch square copper board,  $t < 10\text{sec}$ .
- ⑤  $C_{OSS}$  eff. 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  $I_{SD} \leq 0.36\text{A}$ ,  $di/dt \leq 93\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J \leq 150^\circ\text{C}$ .

### Qualification information<sup>†</sup>

Qualification level	Industrial (per JEDEC JESD47 <sup>††</sup> guidelines)	
Moisture Sensitivity Level	TSOP-6	MSL1 (per JEDEC J-STD-020D <sup>††</sup> )
RoHS compliant	Yes	

<sup>†</sup> Qualification standards can be found at International Rectifier's web site: <http://www.irf.com/product-info/reliability>

<sup>††</sup> Applicable version of JEDEC standard at the time of product release

International  
 Rectifier

**IR WORLD HEADQUARTERS:** 101 N. Sepulveda Blvd., El Segundo, California 90245, USA  
 To contact International Rectifier, please visit <http://www.irf.com/whoto-call/>