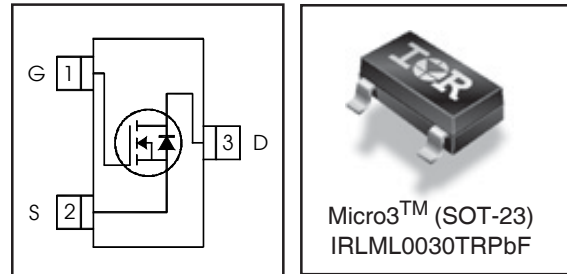




# IRLML0030TRPbF

HEXFET® Power MOSFET

$V_{DS}$	<b>30</b>	<b>V</b>
$V_{GS\ Max}$	<b>± 20</b>	<b>V</b>
$R_{DS(on)\ max}$ (@ $V_{GS} = 10V$ )	<b>27</b>	<b>mΩ</b>
$R_{DS(on)\ max}$ (@ $V_{GS} = 4.5V$ )	<b>40</b>	<b>mΩ</b>



## Application(s)

- Load/ System Switch

## Features and Benefits

### Features

Low $R_{DS(on)}$ ( $\leq 27m\Omega$ )
Industry-standard pinout
Compatible with existing Surface Mount Techniques
RoHS compliant containing no lead, no bromide and no halogen
MSL1, Industrial qualification

results in  
⇒

### Benefits

Lower switching losses
Multi-vendor compatibility
Easier manufacturing
Environmentally friendly
Increased reliability

## Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
$V_{DS}$	Drain-Source Voltage	30	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	5.3	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	4.3	
$I_{DM}$	Pulsed Drain Current	21	
$P_D @ T_A = 25^\circ C$	Maximum Power Dissipation	1.3	W
$P_D @ T_A = 70^\circ C$	Maximum Power Dissipation	0.8	
	Linear Derating Factor	0.01	
$V_{GS}$	Gate-to-Source Voltage	± 20	V
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to + 150	°C

## Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ③	—	100	°C/W
$R_{\theta JA}$	Junction-to-Ambient ( $t < 10s$ ) ④	—	99	

### ORDERING INFORMATION:

See detailed ordering and shipping information on the last page of this data sheet.

Notes ① through ④ are on page 10

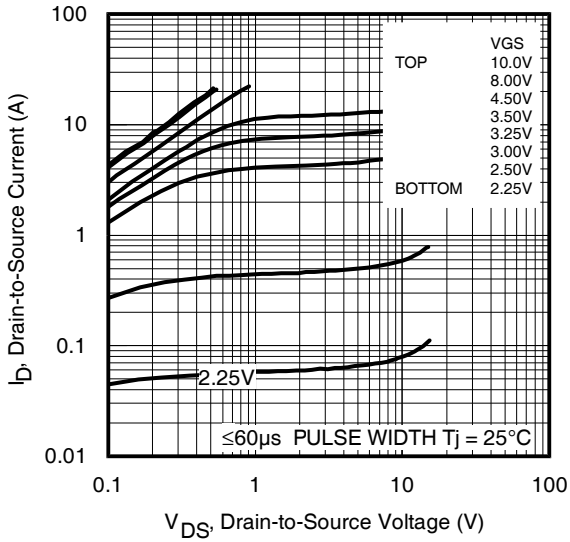
www.irf.com

## Electric Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

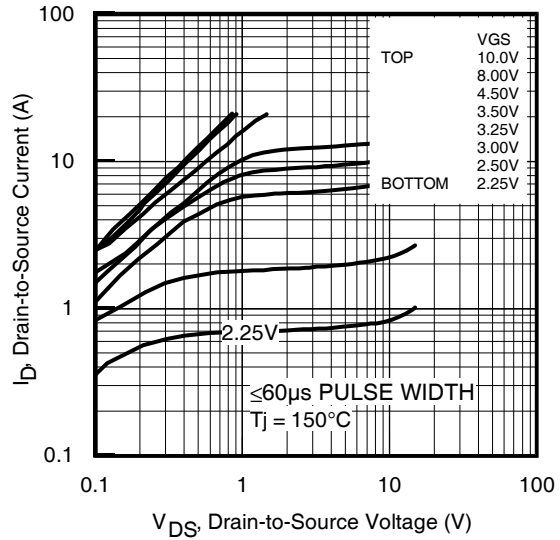
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.02	—	V/°C	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	33	40	m $\Omega$	$V_{GS} = 4.5V, I_D = 4.2A$ ②
		—	22	27		$V_{GS} = 10V, I_D = 5.2A$ ②
$V_{GS(th)}$	Gate Threshold Voltage	1.3	1.7	2.3	V	$V_{DS} = V_{GS}, I_D = 25\mu A$
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	1	$\mu A$	$V_{DS} = 24V, V_{GS} = 0V$
		—	—	150		$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 20V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -20V$
$R_G$	Internal Gate Resistance	—	2.3	—	$\Omega$	
$g_{fs}$	Forward Transconductance	9.5	—	—	S	$V_{DS} = 10V, I_D = 5.2A$
$Q_g$	Total Gate Charge	—	2.6	—	nC	$I_D = 5.2A$
$Q_{gs}$	Gate-to-Source Charge	—	0.8	—		$V_{DS} = 15V$
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	1.1	—		$V_{GS} = 4.5V$ ②
$t_{d(on)}$	Turn-On Delay Time	—	5.2	—	ns	$V_{DD} = 15V$ ②
$t_r$	Rise Time	—	4.4	—		$I_D = 1.0A$
$t_{d(off)}$	Turn-Off Delay Time	—	7.4	—		$R_G = 6.8\Omega$
$t_f$	Fall Time	—	4.4	—		$V_{GS} = 4.5V$
$C_{iss}$	Input Capacitance	—	382	—	pF	$V_{GS} = 0V$
$C_{oss}$	Output Capacitance	—	84	—		$V_{DS} = 15V$
$C_{rss}$	Reverse Transfer Capacitance	—	39	—		$f = 1.0\text{MHz}$

## Source - Drain Ratings and Characteristics

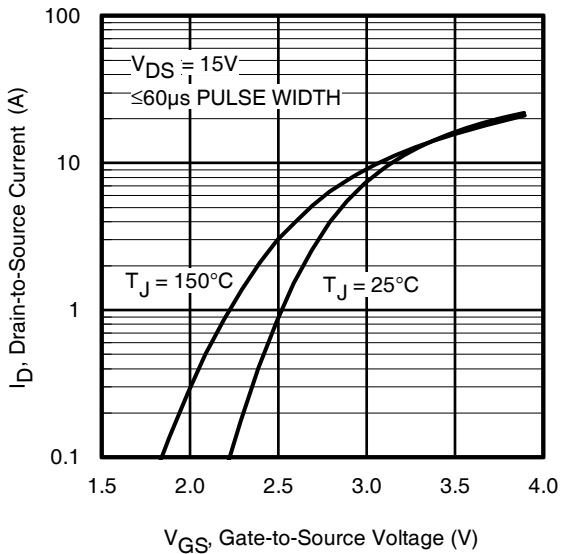
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	1.6	A	MOSFET symbol showing the integral reverse p-n junction diode.
$I_{SM}$	Pulsed Source Current (Body Diode) ①	—	—	21		
$V_{SD}$	Diode Forward Voltage	—	—	1.0	V	$T_J = 25^\circ\text{C}, I_S = 1.6A, V_{GS} = 0V$ ②
$t_{rr}$	Reverse Recovery Time	—	11	17	ns	$T_J = 25^\circ\text{C}, V_R = 15V, I_F = 1.6A$
$Q_{rr}$	Reverse Recovery Charge	—	4.0	6.0	nC	$di/dt = 100A/\mu s$ ②



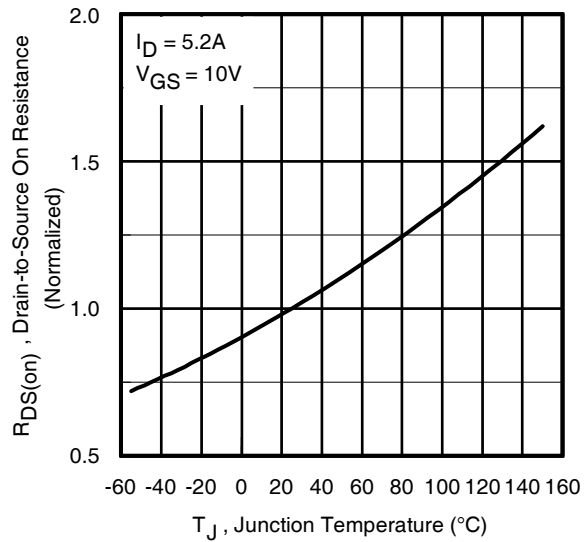
**Fig 1.** Typical Output Characteristics



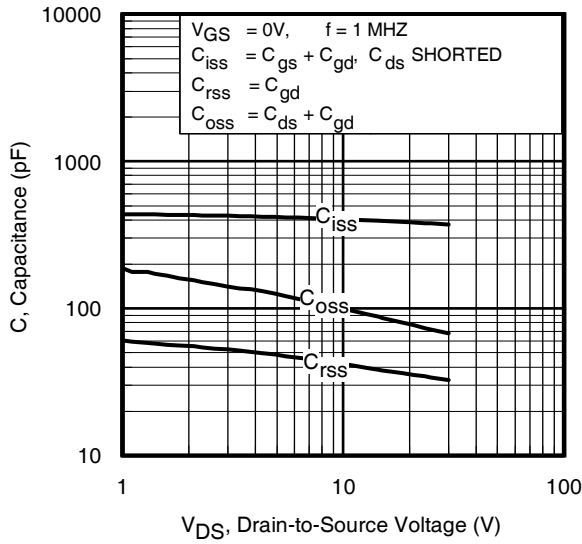
**Fig 2.** Typical Output Characteristics



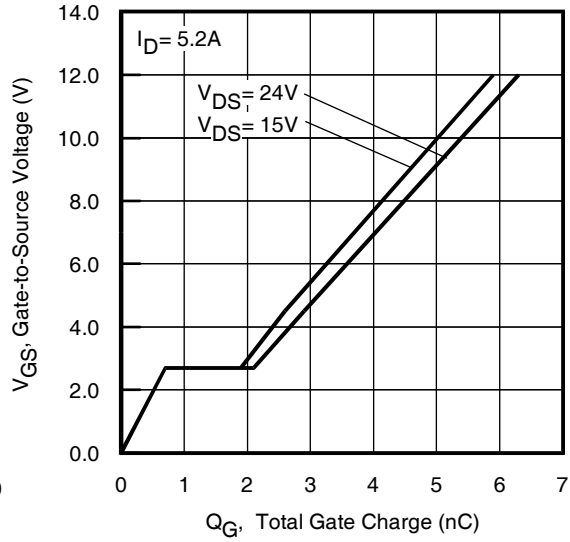
**Fig 3.** Typical Transfer Characteristics



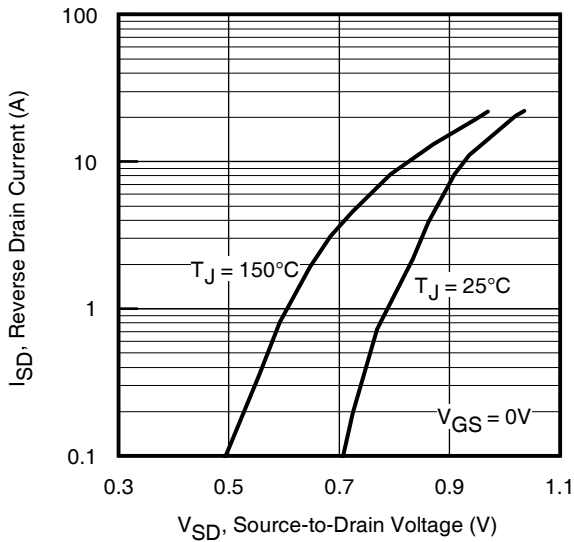
**Fig 4.** Normalized On-Resistance Vs. Temperature



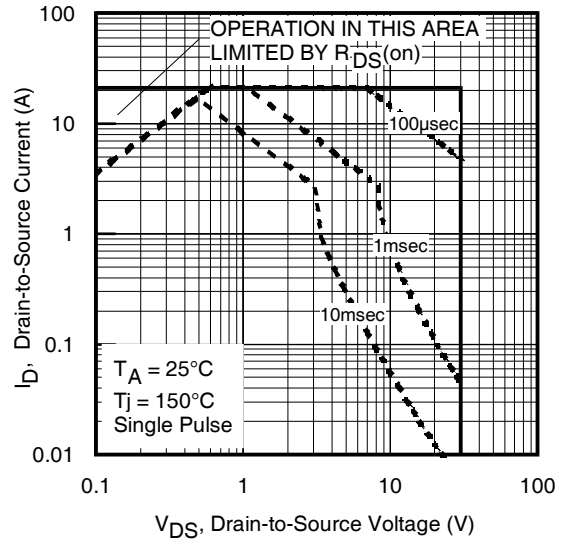
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



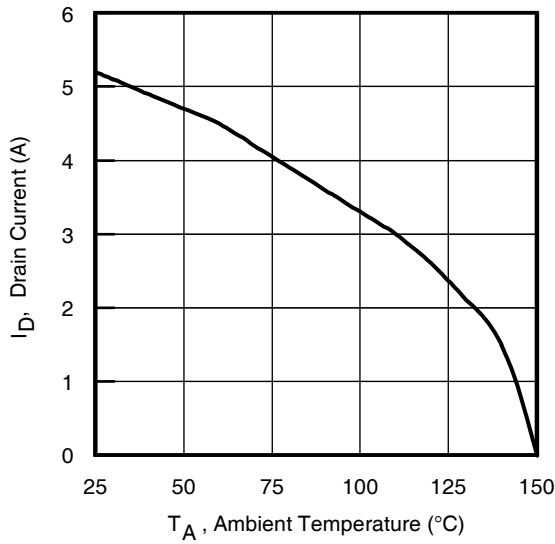
**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage



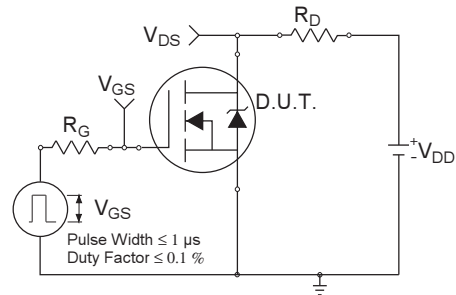
**Fig 7.** Typical Source-Drain Diode Forward Voltage



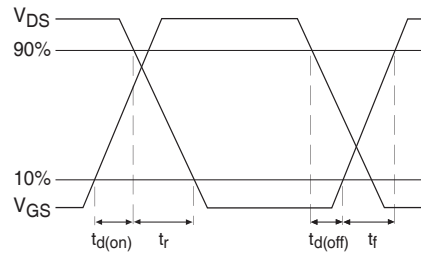
**Fig 8.** Maximum Safe Operating Area



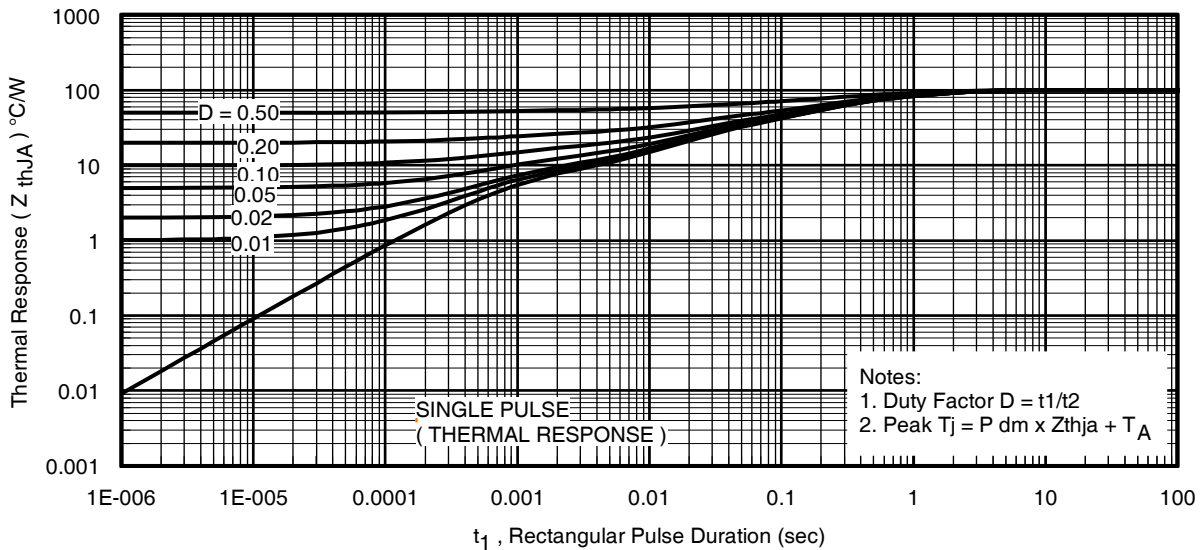
**Fig 9.** Maximum Drain Current Vs. Ambient Temperature



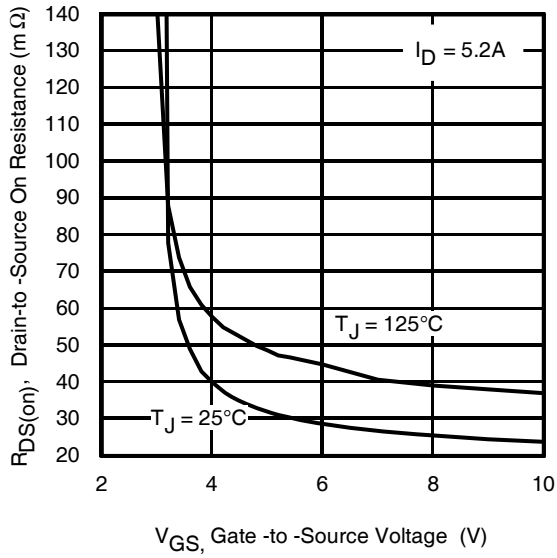
**Fig 10a.** Switching Time Test Circuit



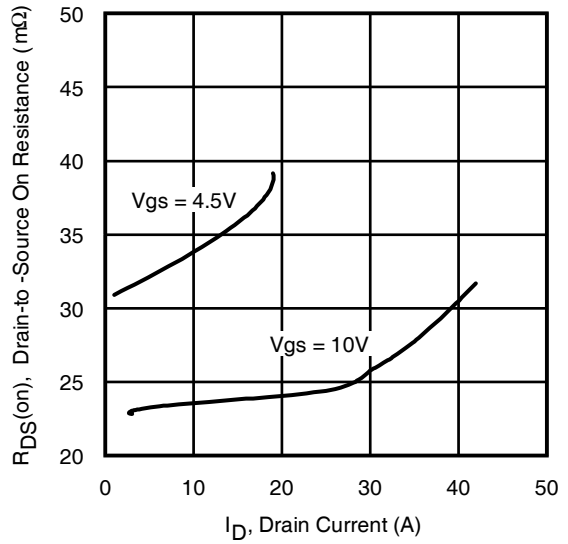
**Fig 10b.** Switching Time Waveforms



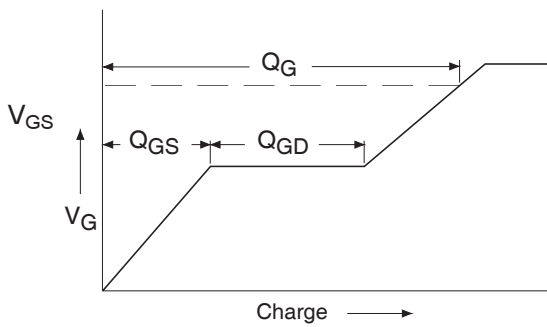
**Fig 11.** Typical Effective Transient Thermal Impedance, Junction-to-Ambient



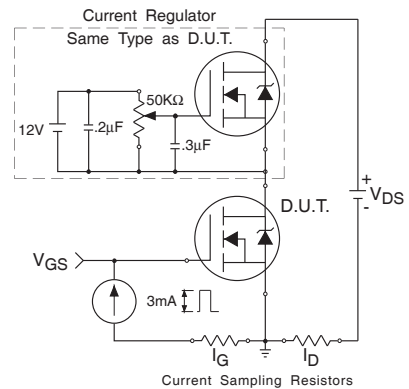
**Fig 12.** Typical On-Resistance Vs. Gate Voltage



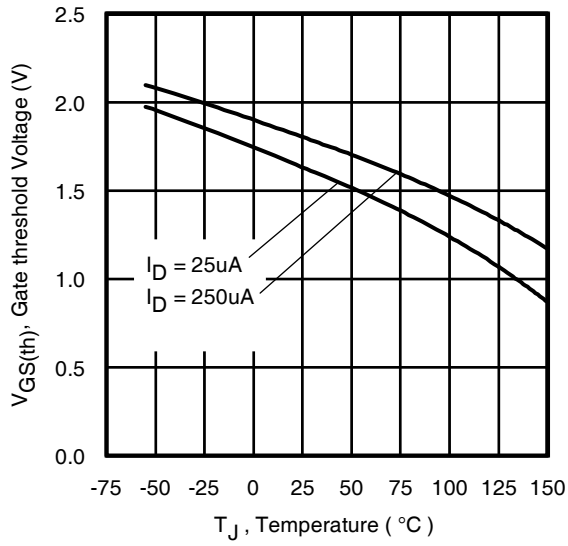
**Fig 13.** Typical On-Resistance Vs. Drain Current



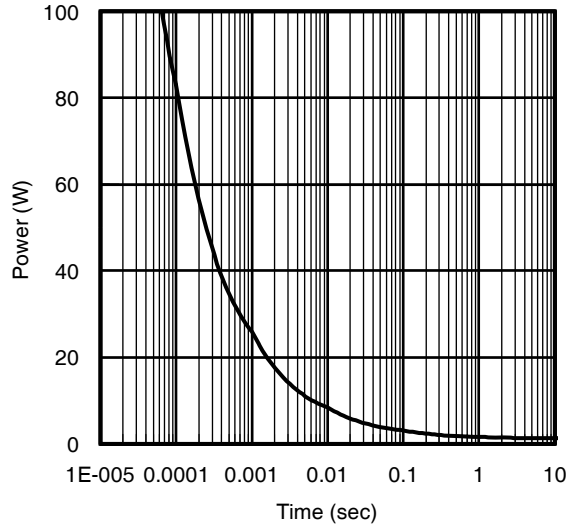
**Fig 14a.** Basic Gate Charge Waveform



**Fig 14b.** Gate Charge Test Circuit



**Fig 15.** Typical Threshold Voltage Vs. Junction Temperature



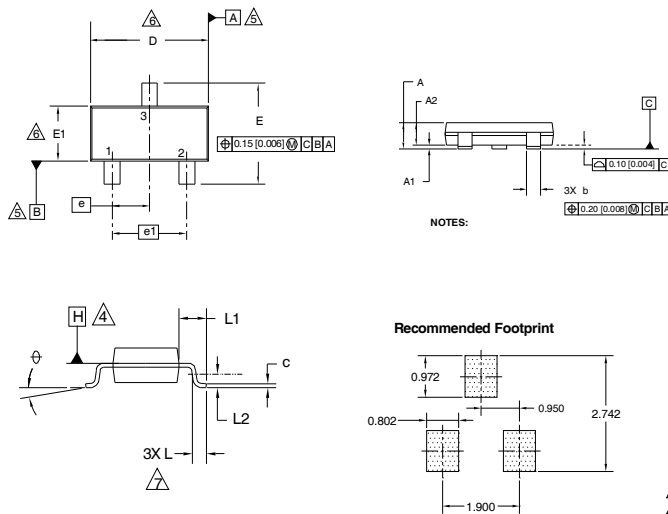
**Fig 16.** Typical Power Vs. Time

# IRLML0030TRPbF

International  
**IR** Rectifier

## Micro3 (SOT-23) Package Outline

Dimensions are shown in millimeters (inches)

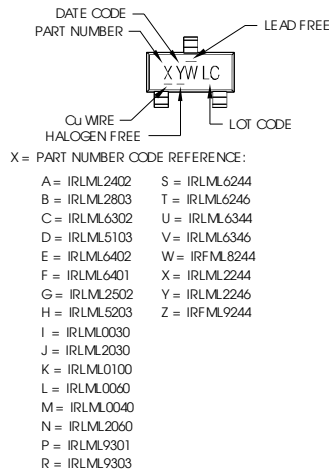


SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.89	1.12	0.035	0.044
A1	0.01	0.10	0.0004	0.004
A2	0.88	1.02	0.035	0.040
b	0.30	0.50	0.012	0.020
c	0.08	0.20	0.003	0.008
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E1	1.20	1.40	0.047	0.055
e	0.95	BSC	0.037	BSC
e1	1.90	BSC	0.075	BSC
L	0.40	0.60	0.016	0.024
L1	0.54	REF	0.021	REF
L2	0.25	BSC	0.010	BSC
⌀	0	8	0	8

1. DIMENSIONING & TOLERANCING PER ANSI Y14.5M-1994
2. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES)
3. CONTROLLING DIMENSION: MILLIMETER
4. DATUM PLANE H IS LOCATED AT THE MOLD PARTING LINE
5. DATUM A AND B TO BE DETERMINED AT DATUM PLANE H
6. DIMENSIONS D AND E1 ARE MEASURED AT DATUM PLANE H. DIMENSIONS DOES NOT INCLUDE MOLD PROTRUSIONS OR INTERLEAD FLASH. MOLD PROTRUSIONS OR INTERLEAD FLASH SHALL NOT EXCEED 0.25 MM [0.010 INCH] PER SIDE.
7. DIMENSION L IS THE LEAD LENGTH FOR SOLDERING TO A SUBSTRATE.
8. OUTLINE CONFORMS TO JEDEC OUTLINE TO-236 AB.

## Micro3 (SOT-23/TO-236AB) Part Marking Information

Notes: This part marking information applies to devices produced after 02/26/2001



X = PART NUMBER CODE REFERENCE:

- |               |               |
|---------------|---------------|
| A = IRLML2402 | S = IRLML6244 |
| B = IRLML2803 | T = IRLML6246 |
| C = IRLML6302 | U = IRLML6344 |
| D = IRLML5103 | V = IRLML6346 |
| E = IRLML6402 | W = IRFML8244 |
| F = IRLML6401 | X = IRLML2244 |
| G = IRLML2502 | Y = IRLML2246 |
| H = IRLML5203 | Z = IRFML9244 |
| I = IRLML0030 |               |
| J = IRLML2030 |               |
| K = IRLML0100 |               |
| L = IRLML0060 |               |
| M = IRLML0040 |               |
| N = IRLML2060 |               |
| P = IRLML9301 |               |
| R = IRLML9303 |               |

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

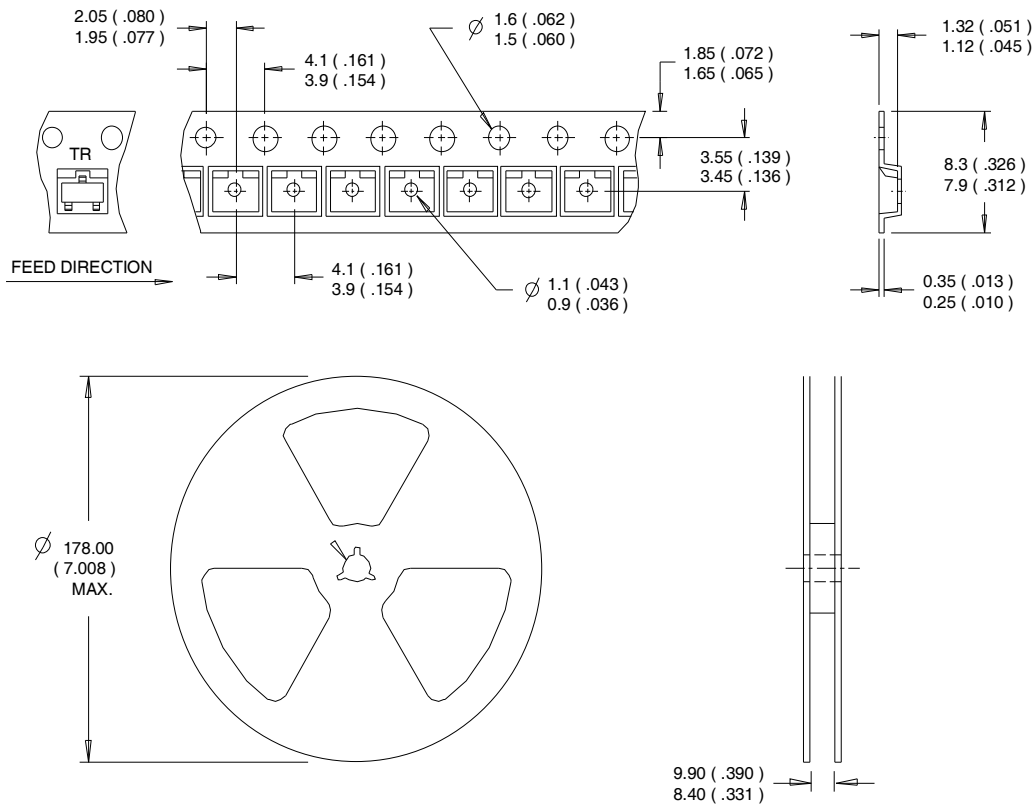
WW = (27-52) IF PRECEDED BY A LETTER

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 IR website at: <http://www.irf.com/package/>

## Micro3™ (SOT-23) Tape & Reel Information

Dimensions are shown in millimeters (inches)



- 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/>

# IRLML0030TRPbF

International  
**IR** Rectifier

Orderable part number	Package Type	Standard Pack		Note
		Form	Quantity	
IRLML0030TRPbF	Micro3 (SOT-23)	Tape and Reel	3000	

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

Qualification level	Consumer <sup>††</sup> (per JEDEC JES D47F <sup>†††</sup> guidelines )	
Moisture Sensitivity Level	Micro3 (SOT-23)	MSL1 (per IPC/JEDEC J-STD-020D <sup>†††</sup> )
RoHS compliant	Yes	

- † Qualification standards can be found at International Rectifier's web site  
<http://www.irf.com/product-info/reliability>
- †† Higher qualification ratings may be available should the user have such requirements.  
Please contact your International Rectifier sales representative for further information:  
<http://www.irf.com/whoto-call/salesrep/>
- ††† Applicable version of JEDEC standard at the time of product release.

## Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width  $\leq 400\mu\text{s}$ ; duty cycle  $\leq 2\%$ .
- ③ Surface mounted on 1 in square Cu board
- ④ Refer to [application note #AN-994](#).

Data and specifications subject to change without notice.

International  
**IR** Rectifier

**IR WORLD HEADQUARTERS:** 101N.Sepulveda blvd, El Segundo, California 90245, USA Tel: (310) 252-7105  
TAC Fax: (310) 252-7903

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