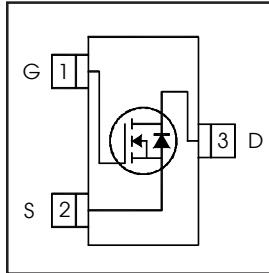


# IRLML6246TRPbF

HEXFET® Power MOSFET

<b>V<sub>DS</sub></b>	<b>20</b>	<b>V</b>
<b>V<sub>GS Max</sub></b>	<b>± 12</b>	<b>V</b>
<b>R<sub>DS(on) max</sub></b> (@V <sub>GS</sub> = 4.5V)	<b>46</b>	<b>mΩ</b>
<b>R<sub>DS(on) max</sub></b> (@V <sub>GS</sub> = 2.5V)	<b>66</b>	<b>mΩ</b>



## Application(s)

- Load/ System Switch

## Features and Benefits

### Features

Industry-standard SOT-23 Package	Multi-vendor compatibility
RoHS compliant containing no lead, no bromide and no halogen	results in Environmentally friendly

### Benefits

## Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
V <sub>DS</sub>	Drain-Source Voltage	20	V
I <sub>D</sub> @ T <sub>A</sub> = 25°C	Continuous Drain Current, V <sub>GS</sub> @ 10V	4.1	A
I <sub>D</sub> @ T <sub>A</sub> = 70°C	Continuous Drain Current, V <sub>GS</sub> @ 10V	3.3	
I <sub>DM</sub>	Pulsed Drain Current	16	
P <sub>D</sub> @ T <sub>A</sub> = 25°C	Maximum Power Dissipation	1.3	W
P <sub>D</sub> @ T <sub>A</sub> = 70°C	Maximum Power Dissipation	0.8	
	Linear Derating Factor	0.01	W/°C
V <sub>GS</sub>	Gate-to-Source Voltage	± 12	V
T <sub>J</sub> , T <sub>STG</sub>	Junction and Storage Temperature Range	-55 to + 150	°C

## Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
R <sub>θJA</sub>	Junction-to-Ambient ③	—	100	°C/W
R <sub>θJA</sub>	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](http://www.irf.com)

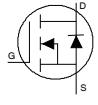
# IRLML6246TRPbF

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**IR** Rectifier

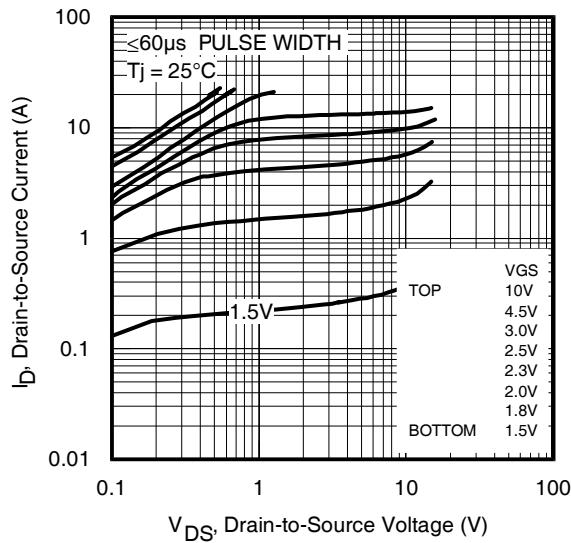
## Electric Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(\text{BR})\text{DSS}}$	Drain-to-Source Breakdown Voltage	20	—	—	V	$V_{GS} = 0V, I_D = 250\mu\text{A}$
$\Delta V_{(\text{BR})\text{DSS}/\Delta T_J}$	Breakdown Voltage Temp. Coefficient	—	0.03	—	V/ $^{\circ}\text{C}$	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
$R_{DS(\text{on})}$	Static Drain-to-Source On-Resistance	—	30	46	$\text{m}\Omega$	$V_{GS} = 4.5V, I_D = 4.1\text{A}$ ②
		—	45	66		$V_{GS} = 2.5V, I_D = 3.3\text{A}$ ②
$V_{GS(\text{th})}$	Gate Threshold Voltage	0.5	0.8	1.1	V	$V_{DS} = V_{GS}, I_D = 5\mu\text{A}$
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	1.0	$\mu\text{A}$	$V_{DS} = 16V, V_{GS} = 0V$
		—	—	10		$V_{DS} = 16V, V_{GS} = 0V, T_J = 55^\circ\text{C}$
		—	—	150		$V_{DS} = 16V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	100	$\text{nA}$	$V_{GS} = 12V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -12V$
$R_G$	Internal Gate Resistance	—	4.0	—	$\Omega$	
$gfs$	Forward Transconductance	10	—	—	S	$V_{DS} = 10V, I_D = 4.1\text{A}$
$Q_g$	Total Gate Charge	—	3.5	—	$\text{nC}$	$I_D = 4.1\text{A}$
$Q_{gs}$	Gate-to-Source Charge	—	0.26	—		$V_{DS} = 10V$
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	1.7	—		$V_{GS} = 4.5V$ ②
$t_{d(on)}$	Turn-On Delay Time	—	3.6	—	$\text{ns}$	$V_{DD} = 10V$ ②
$t_r$	Rise Time	—	4.9	—		$I_D = 1.0\text{A}$
$t_{d(off)}$	Turn-Off Delay Time	—	11	—		$R_G = 6.8\Omega$
$t_f$	Fall Time	—	6.0	—		$V_{GS} = 4.5V$
$C_{iss}$	Input Capacitance	—	290	—	$\text{pF}$	$V_{GS} = 0V$
$C_{oss}$	Output Capacitance	—	64	—		$V_{DS} = 16V$
$C_{rss}$	Reverse Transfer Capacitance	—	41	—		$f = 1.0\text{MHz}$

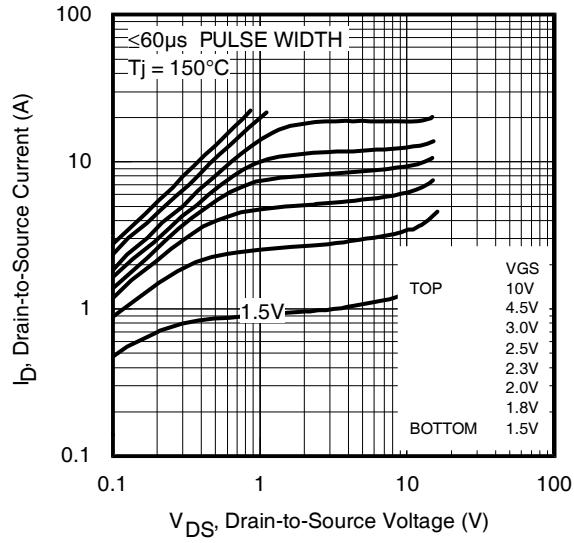
## Source - Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_s$	Continuous Source Current (Body Diode)	—	—	1.3	A	MOSFET symbol showing the integral reverse p-n junction diode.
	Pulsed Source Current (Body Diode) ①	—	—	16		
$V_{SD}$	Diode Forward Voltage	—	—	1.2	V	$T_J = 25^\circ\text{C}, I_s = 4.1\text{A}, V_{GS} = 0V$ ②
$t_{rr}$	Reverse Recovery Time	—	8.6	13	ns	$T_J = 25^\circ\text{C}, V_R = 15V, I_F = 1.3\text{A}$
$Q_{rr}$	Reverse Recovery Charge	—	2.8	4.2	nC	$dI/dt = 100\text{A}/\mu\text{s}$ ②

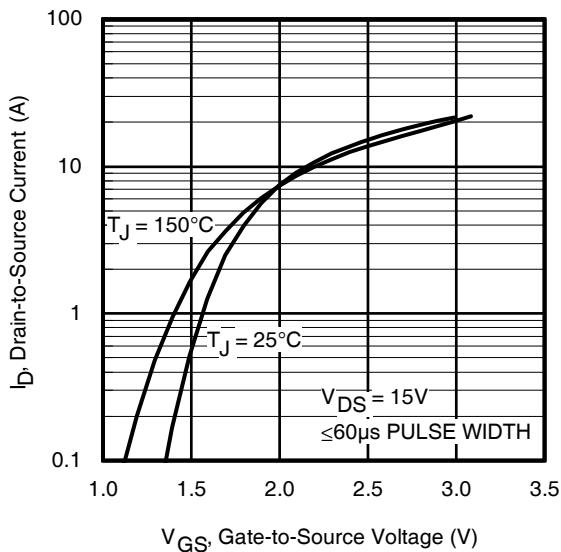
## IRML6246TRPbF



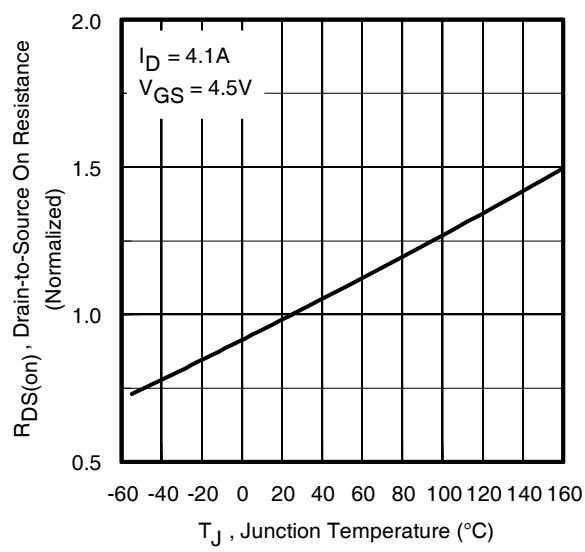
**Fig 1.** Typical Output Characteristics



**Fig 2.** Typical Output Characteristics



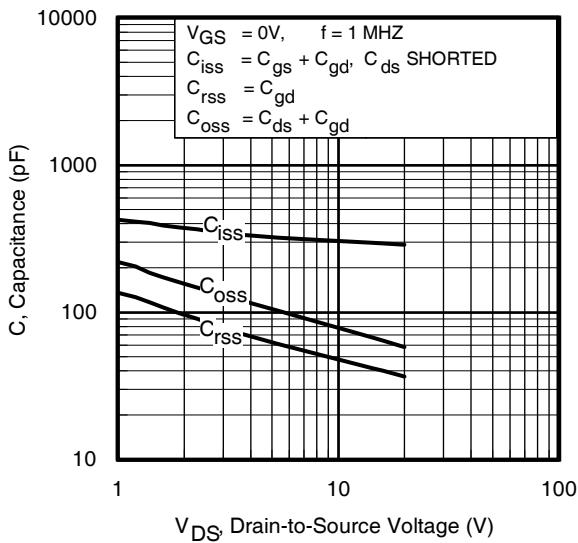
**Fig 3.** Typical Transfer Characteristics



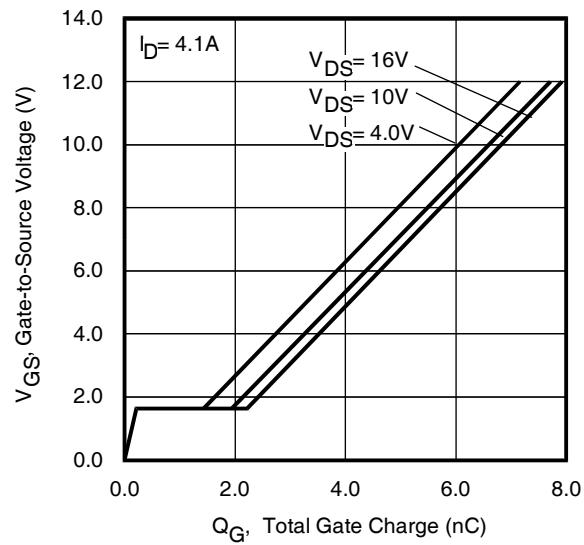
**Fig 4.** Normalized On-Resistance  
Vs. Temperature

# IRLML6246TRPbF

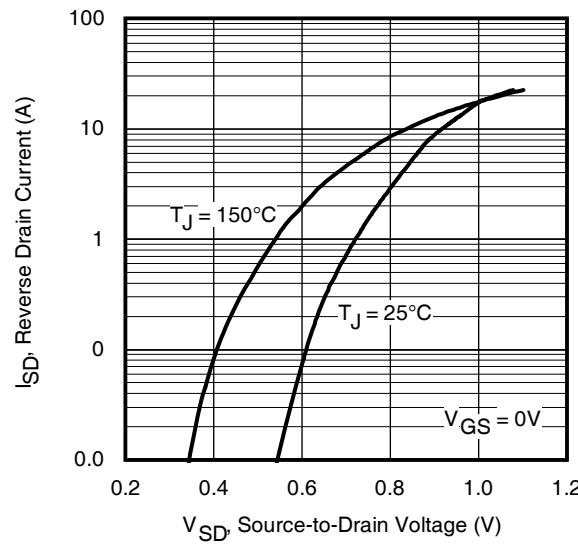
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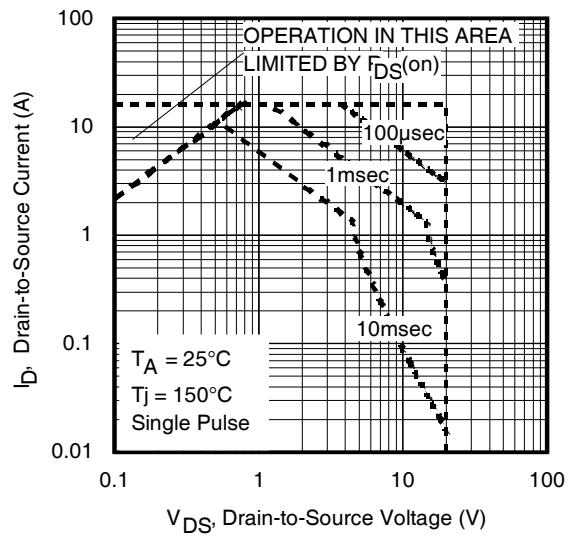
**Fig 5.** Typical Capacitance Vs.  
Drain-to-Source Voltage



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

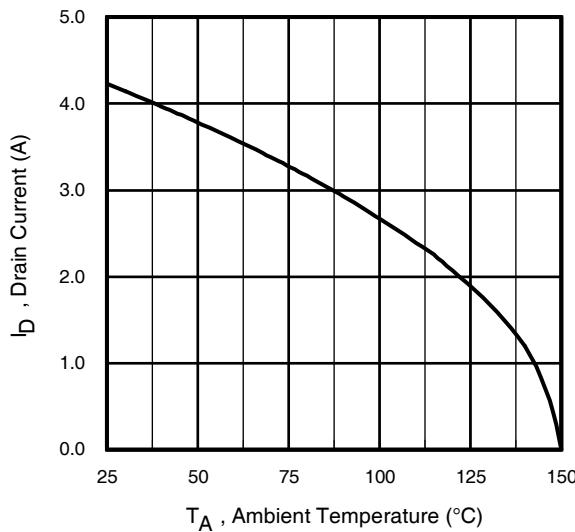


**Fig 7.** Typical Source-Drain Diode  
Forward Voltage

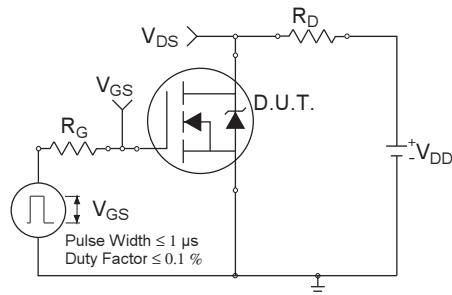


**Fig 8.** Maximum Safe Operating Area

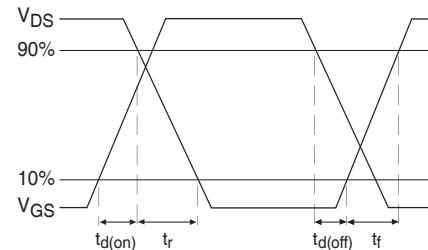
## IRML6246TRPbF



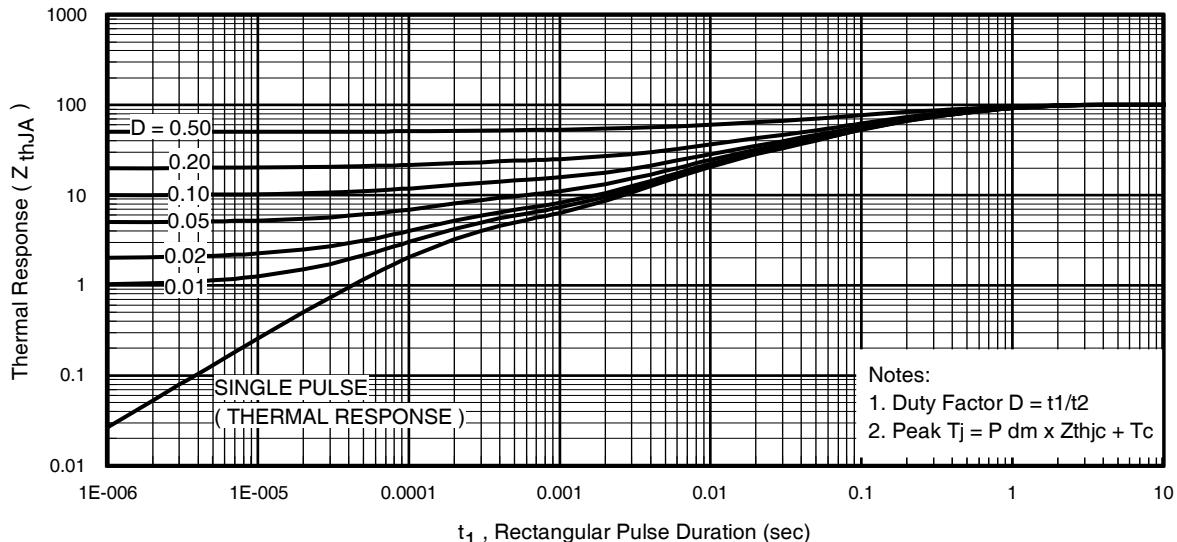
**Fig 9.** Maximum Drain Current Vs.  
Ambient Temperature



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



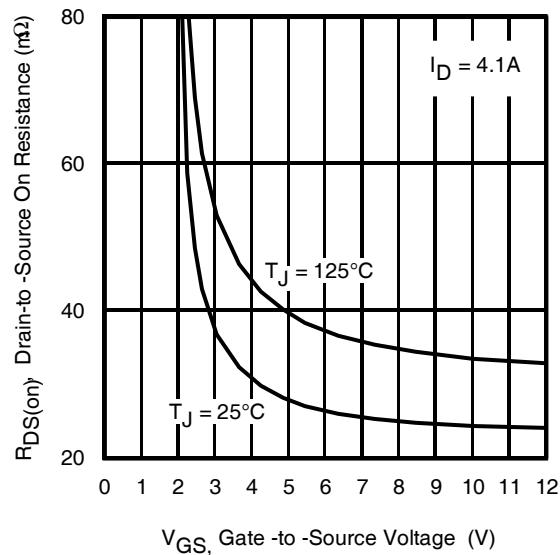
**Fig 10b.** Switching Time Waveforms



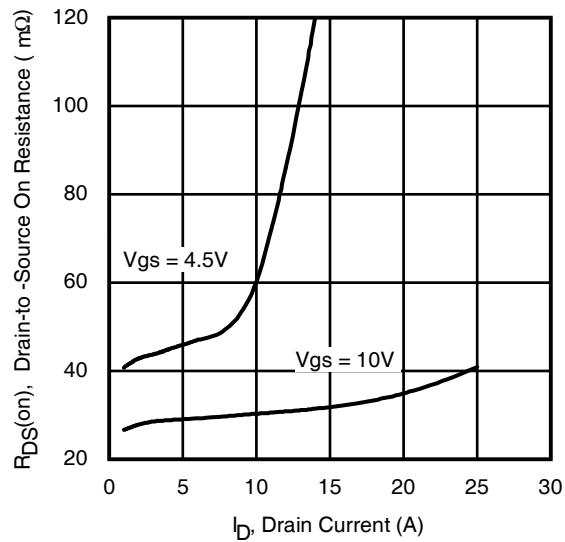
**Fig 11.** Typical Effective Transient Thermal Impedance, Junction-to-Ambient

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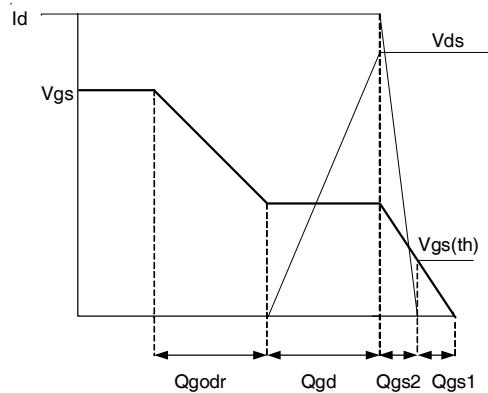
International  
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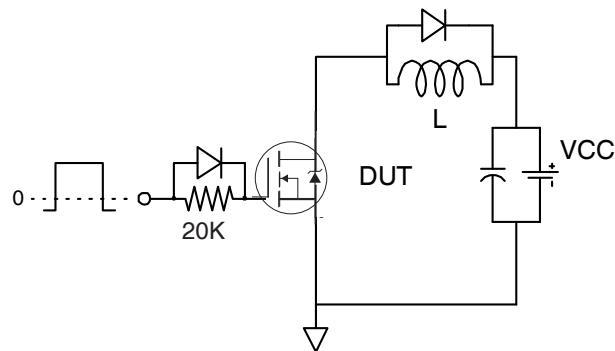
**Fig 12.** Typical On-Resistance Vs. Gate Voltage



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

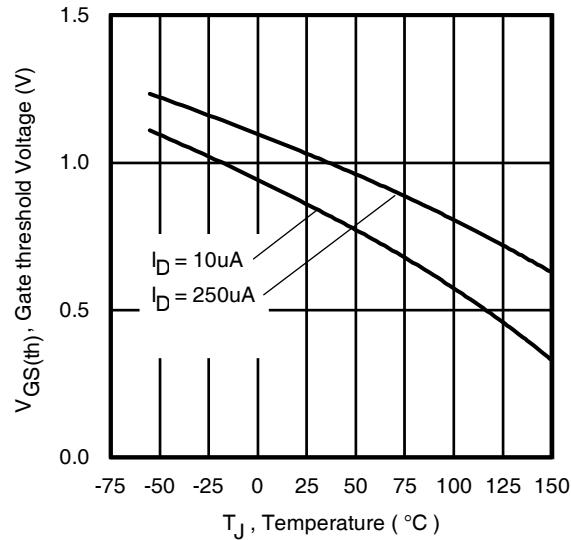


**Fig 14a.** Basic Gate Charge Waveform

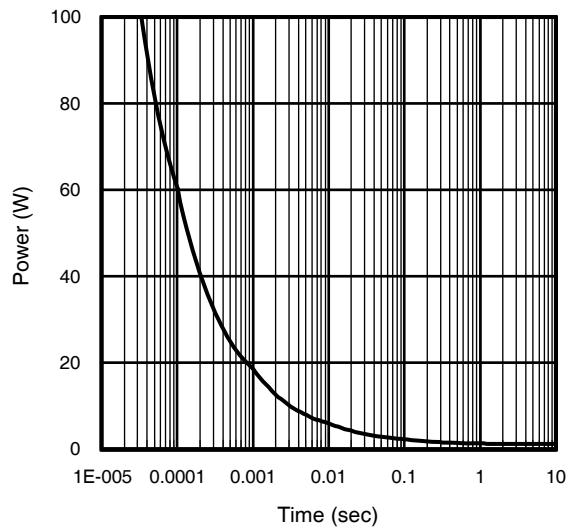


**Fig 14b.** Gate Charge Test Circuit

## IRML6246TRPbF



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



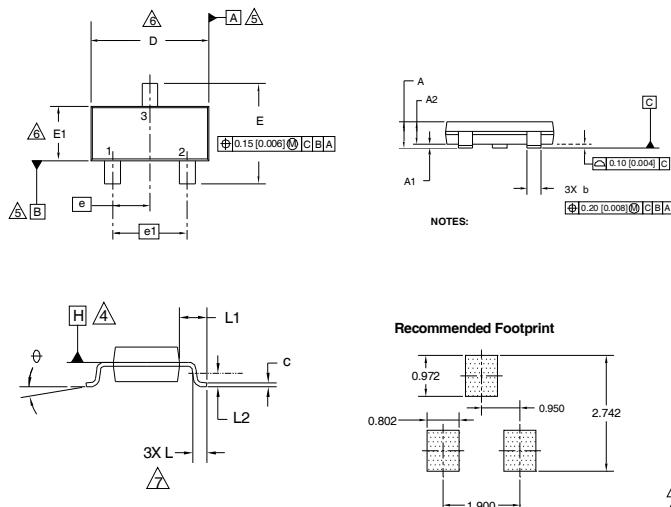
**Fig 16.** Typical Power Vs. Time

# IRLML6246TRPbF

International  
**IR** Rectifier

## Micro3™(SOT-23) Package Outline

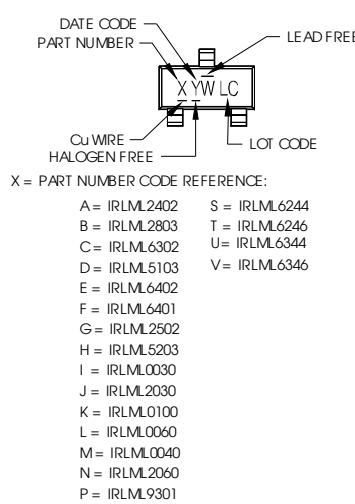
Dimensions are shown in millimeters (inches)



SYMBOL	DIMENSIONS			
	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
θ	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 L1 IS THE LEAD LENGTH FOR SOLDERING TO A SUBSTRATE.
8. OUTLINE CONFORMS TO JEDEC OUTLINE TO-236 AB.

## Micro3™(SOT-23) Part Marking Information



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

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

YEAR	Y	WORK WEEK	W
2001	1	01	A
2002	2	02	B
2003	3	03	C
2004	4	04	D
2005	5		
2006	6		
2007	7		
2008	8		
2009	9		
2010	0	24	X
		25	Y
		26	Z

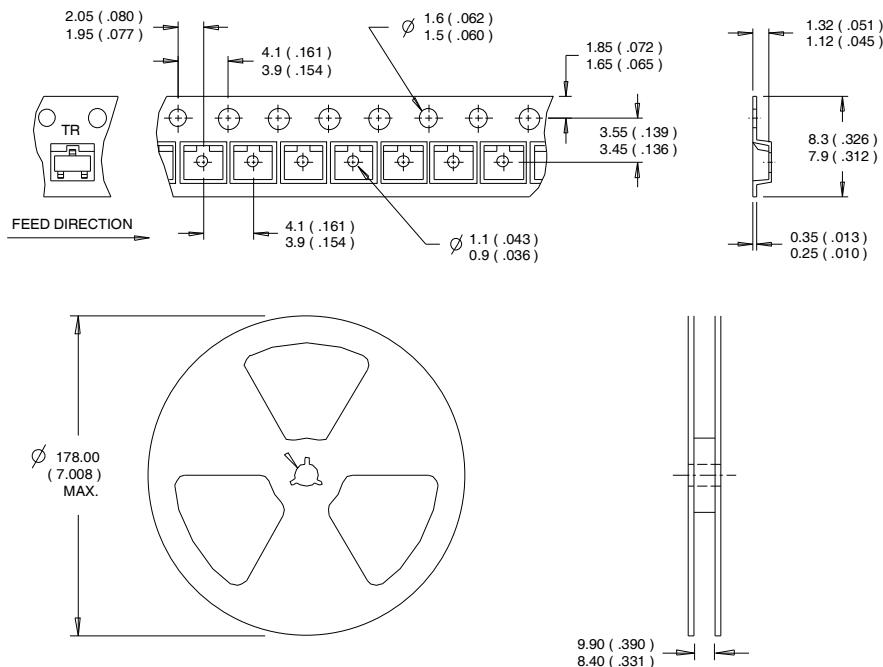
W = (27-52) IF PRECEDED BY A LETTER

YEAR	Y	WORK WEEK	W
2001	A	27	A
2002	B	28	B
2003	C	29	C
2004	D	30	D
2005	E		
2006	F		
2007	G		
2008	H		
2009	J	50	X
2010	K	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/>

# IRLML6246TRPbF

International  
**IR** Rectifier

Orderable part number	Package Type	Standard Pack		Note
		Form	Quantity	
IRLML6246TRPbF	Micro3™(SOT-23)	Tape and Reel	3000	

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

Qualification level	Consumer <sup>††</sup> (per JEDEC JESD47F <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  $\leq 400\mu s$ ; duty cycle  $\leq 2\%$ .
- ③ Surface mounted on 1 in square Cu board
- ④ Refer to [application note #AN-994](#).

## Revision History

Date	Comments
10/12/2012	Added IDSS @ 16V, $T_J = 55C$ -pg2

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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