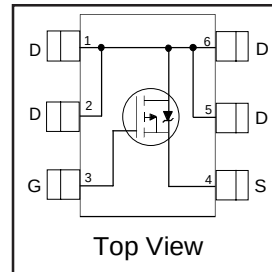


IRLMS4502

HEXFET® Power MOSFET

- Ultra Low On-Resistance
- P-Channel MOSFET
- Surface Mount
- Available in Tape & Reel



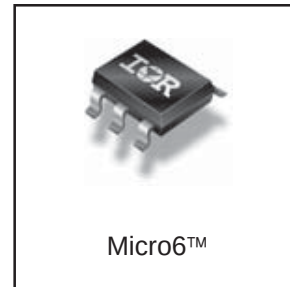
$$V_{DS} = -12V$$

$$R_{DS(on)} = 0.042\Omega$$

Description

These P-Channel 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 Micro6 package with its customized leadframe produces a HEXFET power MOSFET with $R_{DS(on)}$ 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.



Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain- Source Voltage	-12	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V$	-5.5	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V$	-4.4	
I_{DM}	Pulsed Drain Current ①	-44	
$P_D @ T_A = 25^\circ C$	Power Dissipation	1.7	W
$P_D @ T_A = 70^\circ C$	Power Dissipation	1.1	
	Linear Derating Factor	0.013	W/°C
E_{AS}	Single Pulse Avalanche Energy④	28	mJ
V_{GS}	Gate-to-Source Voltage	± 12	V
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

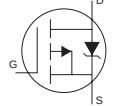
Thermal Resistance

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient③	75	°C/W

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-12	—	—	V	$V_{GS} = 0V$, $I_D = -250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	-0.003	—	V/ $^\circ\text{C}$	Reference to 25°C , $I_D = -1mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.042	Ω	$V_{GS} = -4.5V$, $I_D = -5.5A$ ②
		—	—	0.075		$V_{GS} = -2.5V$, $I_D = -4.7A$ ②
$V_{GS(th)}$	Gate Threshold Voltage	-0.60	—	—	V	$V_{DS} = V_{GS}$, $I_D = -250\mu A$
g_{fs}	Forward Transconductance	8.8	—	—	S	$V_{DS} = -10V$, $I_D = -5.5A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	-1.0	μA	$V_{DS} = -12V$, $V_{GS} = 0V$
		—	—	-25		$V_{DS} = -9.6V$, $V_{GS} = 0V$, $T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	-100	nA	$V_{GS} = -12V$
	Gate-to-Source Reverse Leakage	—	—	100		$V_{GS} = 12V$
Q_g	Total Gate Charge	—	22	33	nC	$I_D = -5.5A$
Q_{gs}	Gate-to-Source Charge	—	3.9	5.8		$V_{DS} = -10V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	11	16		$V_{GS} = -5.0V$ ②
$t_{d(on)}$	Turn-On Delay Time	—	18	—	ns	$V_{DD} = -6.0V$
t_r	Rise Time	—	460	—		$I_D = -1.0A$
$t_{d(off)}$	Turn-Off Delay Time	—	130	—		$R_G = 4.5\Omega$
t_f	Fall Time	—	250	—		$R_D = 6.0\Omega$ ②
C_{iss}	Input Capacitance	—	1820	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	1110	—		$V_{DS} = -10V$
C_{rss}	Reverse Transfer Capacitance	—	1070	—		$f = 1.0kHz$

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-1.7	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	-44		
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	$T_J = 25^\circ\text{C}$, $I_S = -1.7A$, $V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time	—	31	46	ns	$T_J = 25^\circ\text{C}$, $I_F = -5.5A$
Q_{rr}	Reverse Recovery Charge	—	21	32	nC	$di/dt = -100A/\mu s$ ②

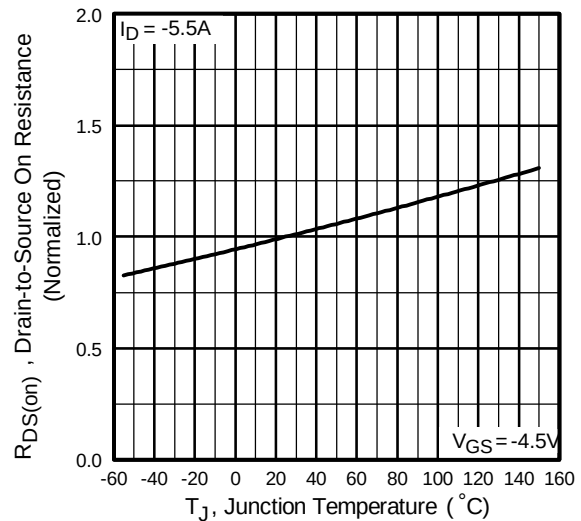
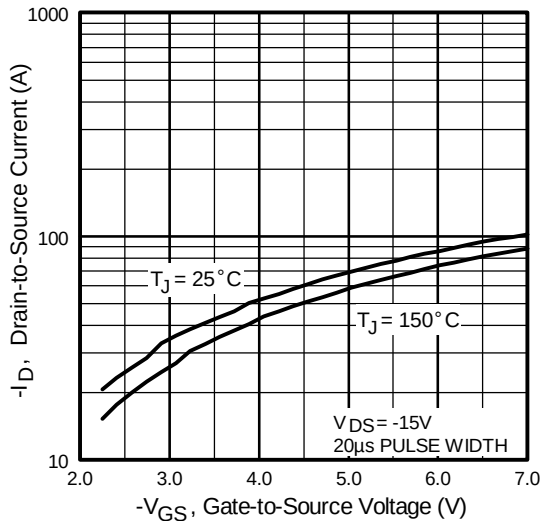
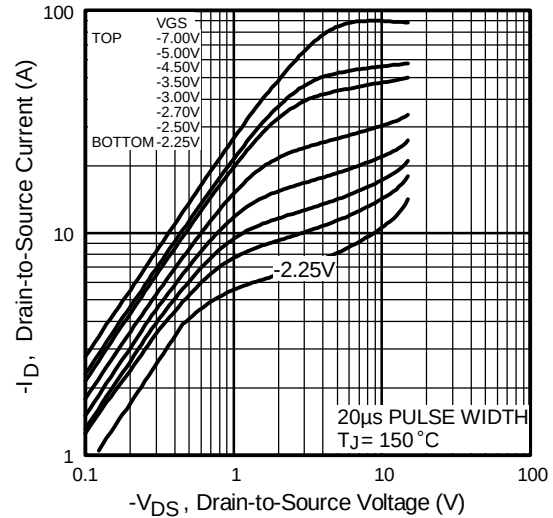
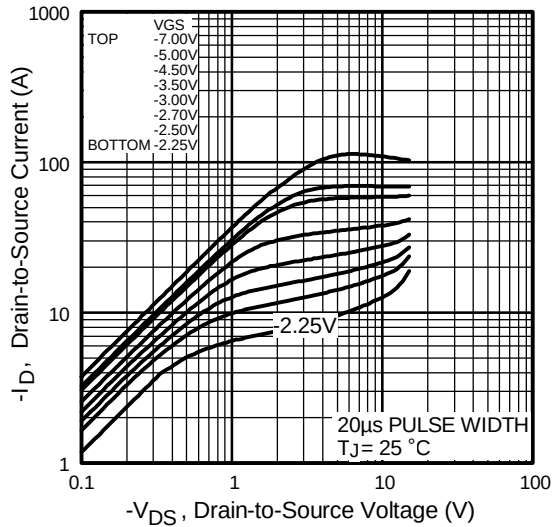
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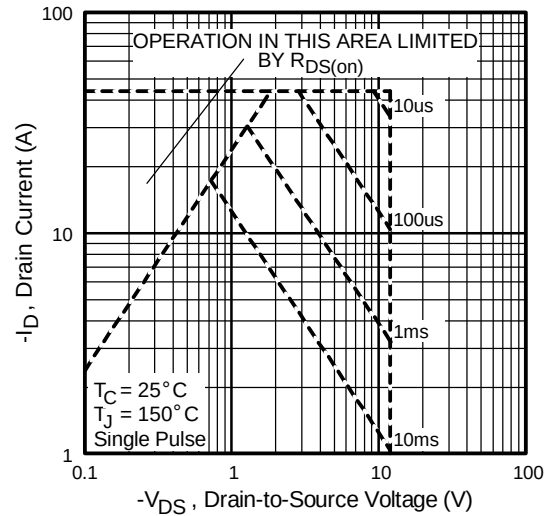
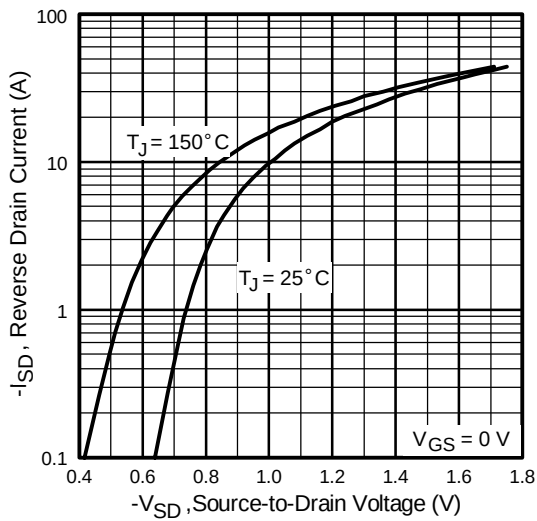
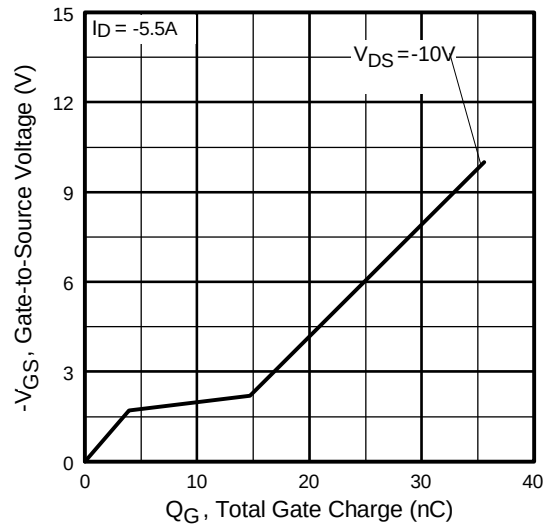
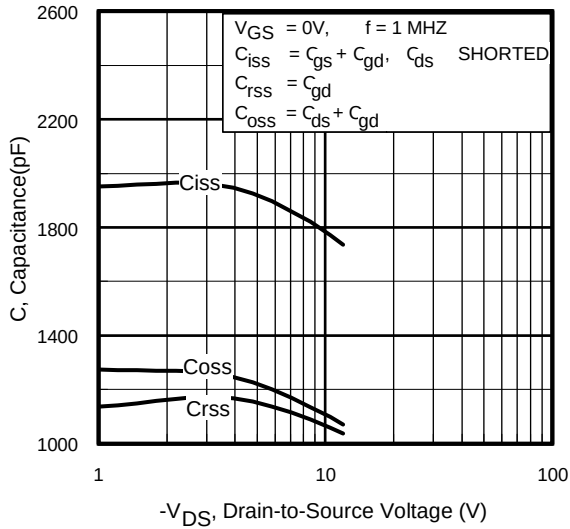
① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)

② Pulse width $\leq 400\mu s$; duty cycle $\leq 2\%$.

③ Surface mounted on FR-4 board, $t \leq 5sec$.

④ Starting $T_J = 25^\circ\text{C}$, $L = 1.8mH$
 $R_G = 25\Omega$, $I_{AS} = -5.5A$. (See Figure 12)





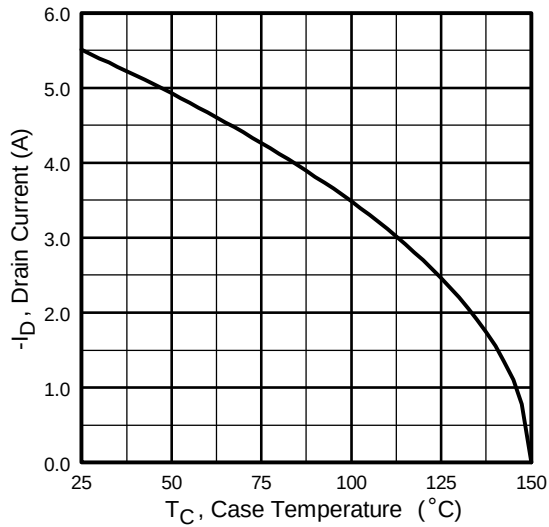


Fig 9. Maximum Drain Current Vs. Case Temperature

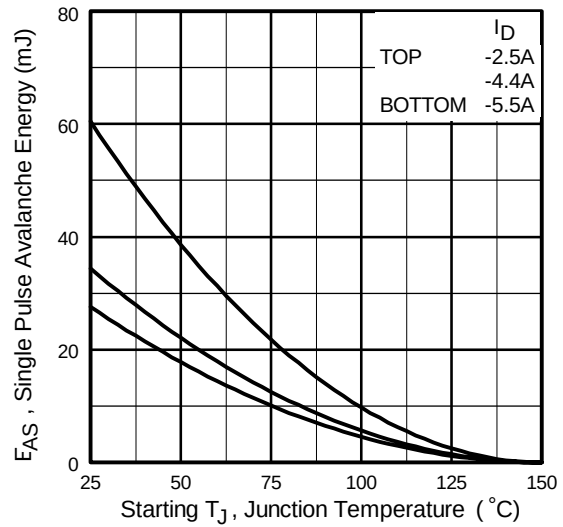


Fig 10. Maximum Avalanche Energy Vs. Drain Current

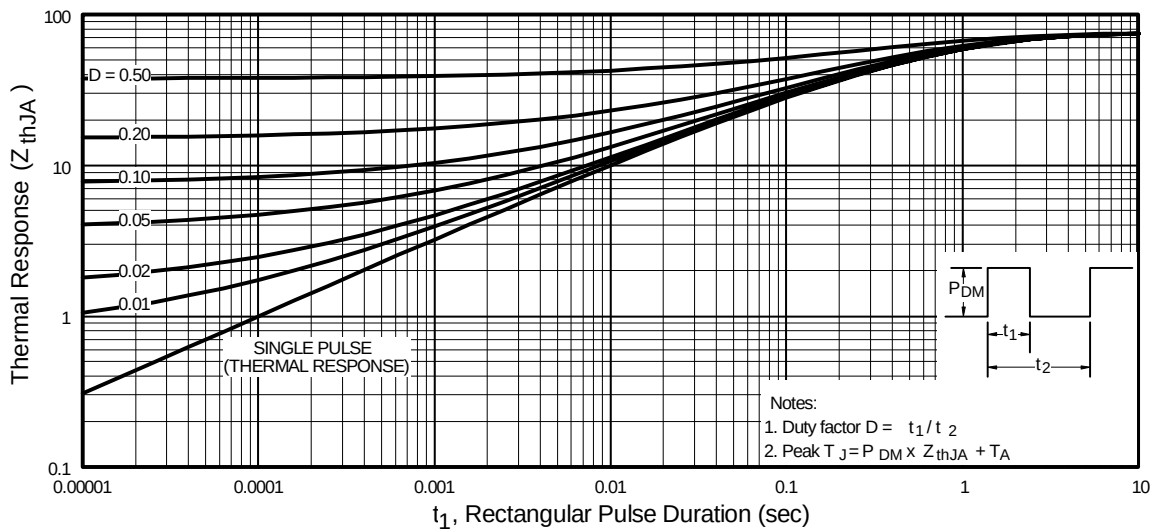
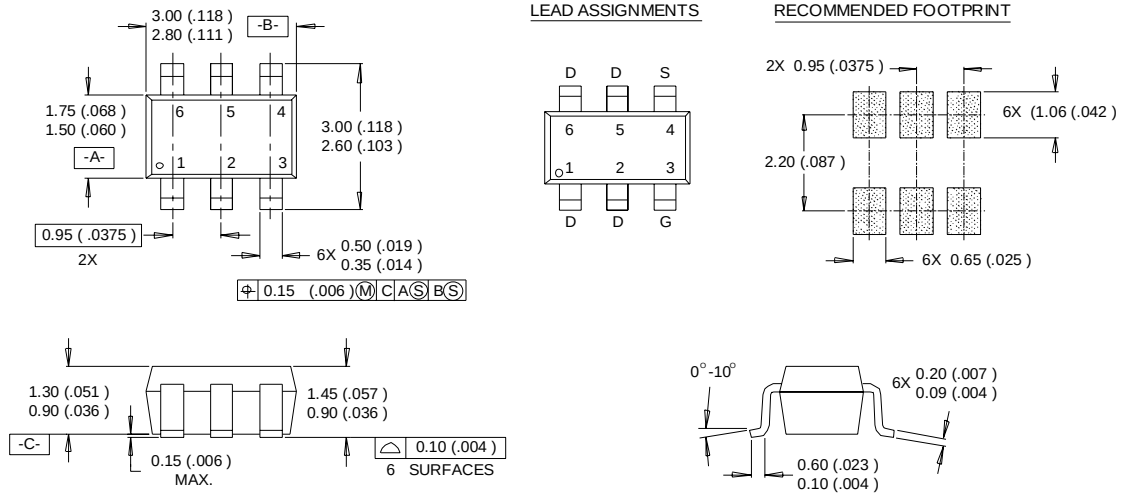


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

IRLMS4502

International
IR Rectifier

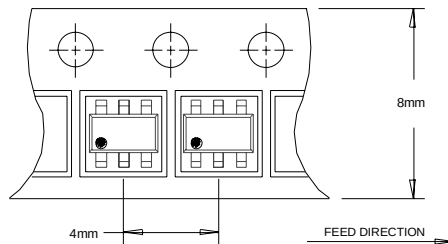
Micro6™ Package Outline



NOTES :

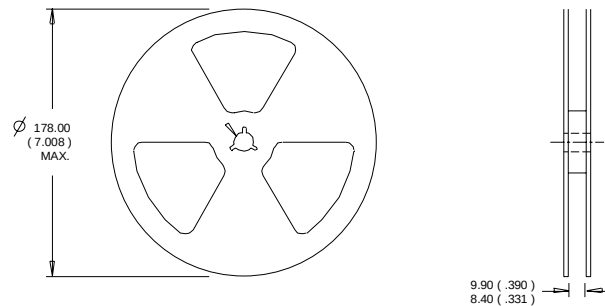
1. DIMENSIONING & TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION : MILLIMETER.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).

Micro6™ 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.

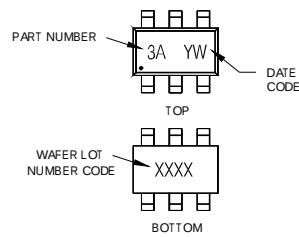
Micro6™ Part Marking Information

IRLMS4502

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

EXAMPLE: THIS IS AN IRLMS6702

WW = (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		
1996	6		
1997	7		
1998	8		
1999	9		
2000	0	24	X
		25	Y
		26	Z

PART NUMBER CODE REFERENCE:

2A = IRLMS1902
2B = IRLMS1503
2C = IRLMS6702
2D = IRLMS5703
2E = IRLMS6802
2F = IRLMS4502
2G = IRLMS2002
2H = IRLMS6803

DATE CODE EXAMPLES:

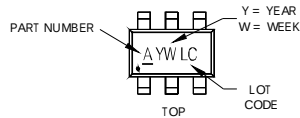
YWW = 9603 = 6C
YWW = 9632 = FF

WW = (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		
1996	F		
1997	G		
1998	H		
1999	J		
2000	K	50	X
		51	Y
		52	Z

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

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



PART NUMBER CODE REFERENCE:

A = IRLMS1902
B = IRLMS1503
C = IRLMS6702
D = IRLMS5703
E = IRLMS6802
F = IRLMS4502
G = IRLMS2002
H = IRLMS6803

YEAR	Y	WORK WEEK	W
2001	1	01	A
2002	2	02	B
2003	3	03	C
2004	4	04	D
2005	5		
1996	6		
1997	7		
1998	8		
1999	9		
2000	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		
1996	F		
1997	G		
1998	H		
1999	J		
2000	K	50	X
		51	Y
		52	Z

This product has been designed and qualified for the consumer market.
Qualification Standards can be found on IR's Web site.

International
IR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7903

Visit us at www.irf.com for sales contact information.

Data and specifications subject to change without notice. 01/03