

IRLMS6702

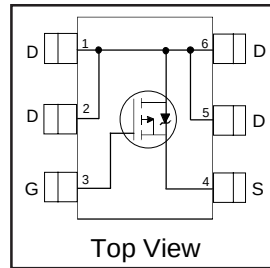
HEXFET® Power MOSFET

- Generation V Technology
- Micro6 Package Style
- Ultra Low $R_{DS(on)}$
- P-Channel MOSFET

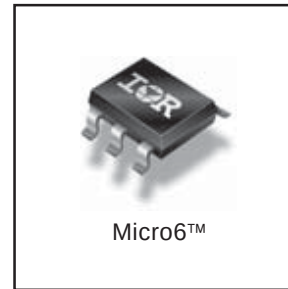
Description

Fifth Generation HEXFET® power MOSFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET® power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of 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. Its unique thermal design and $R_{DS(on)}$ reduction enables a current-handling increase of nearly 300% compared to the SOT-23.



$V_{DSS} = -20V$
$R_{DS(on)} = 0.20\Omega$



Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V$	2.4	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V$	1.9	
I_{DM}	Pulsed Drain Current ①	13	
$P_D @ T_A = 25^\circ C$	Power Dissipation	1.7	W
	Linear Derating Factor	13	mW/°C
V_{GS}	Gate to Source Voltage	± 12	V
dv/dt	Peak Diode Recovery dv/dt ②	5.0	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	55 to + 150	°C

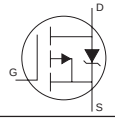
Thermal Resistance Ratings

	Parameter	Min.	Typ.	Max	Units
$R_{\theta JA}$	Maximum Junction to Ambient ④			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	20			V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient		0.005		V/ $^\circ\text{C}$	Reference to 25°C , $I_D = 1\text{mA}$
$R_{DS(on)}$	Static Drain to Source On Resistance			0.200	Ω	$V_{GS} = 4.5V, I_D = 1.6A$ ③
				0.375		$V_{GS} = 2.7V, I_D = 0.80A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	0.70			V	$V_{DS} = V_{GS}, I_D = 250\mu A$
g_{fs}	Forward Transconductance	1.5			S	$V_{DS} = 10V, I_D = 0.80A$
I_{DSS}	Drain to Source Leakage Current			1.0	μA	$V_{DS} = 16V, V_{GS} = 0V$
				25		$V_{DS} = 16V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
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		5.8	8.8	nC	$I_D = 1.6A$
Q_{gs}	Gate to Source Charge		1.8	2.6		$V_{DS} = 16V$
Q_{gd}	Gate to Drain ("Miller") Charge		2.1	3.1		$V_{GS} = 4.5V$, See Fig. 6 and 9 ③
$t_{d(on)}$	Turn On Delay Time		13		ns	$V_{DD} = 10V$
t_r	Rise Time		20			$I_D = 1.6A$
$t_{d(off)}$	Turn Off Delay Time		21			$R_G = 6.0\Omega$
t_f	Fall Time		18			$R_D = 6.1\Omega$, See Fig. 10 ③
C_{iss}	Input Capacitance		210		pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance		130			$V_{DS} = 15V$
C_{rss}	Reverse Transfer Capacitance		73			$f = 1.0\text{MHz}$, See Fig. 5

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			13		
V_{SD}	Diode Forward Voltage			1.2	V	$T_J = 25^\circ\text{C}, I_S = 1.6A, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time		25	37	ns	$T_J = 25^\circ\text{C}, I_F = 1.6A$
Q_{rr}	Reverse Recovery Charge		15	22	nC	$di/dt = 100A/\mu s$ ③

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)
- ② $I_{SD} \leq 1.6A, di/dt \leq 100A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 150^\circ\text{C}$
- ③ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.
- ④ Surface mounted on FR 4 board, $t \leq 5\text{sec}$.

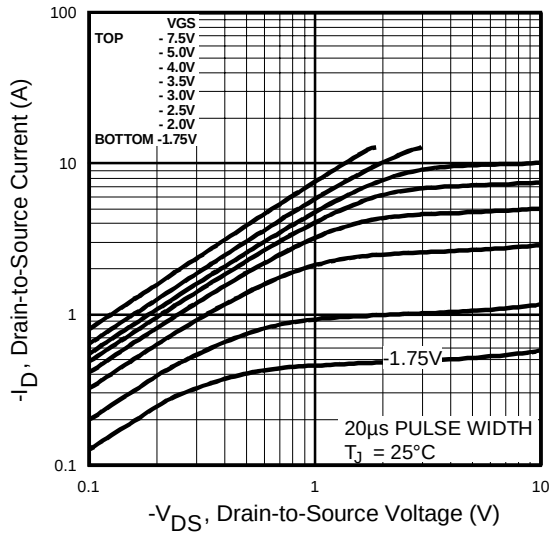


Fig 1. Typical Output Characteristics

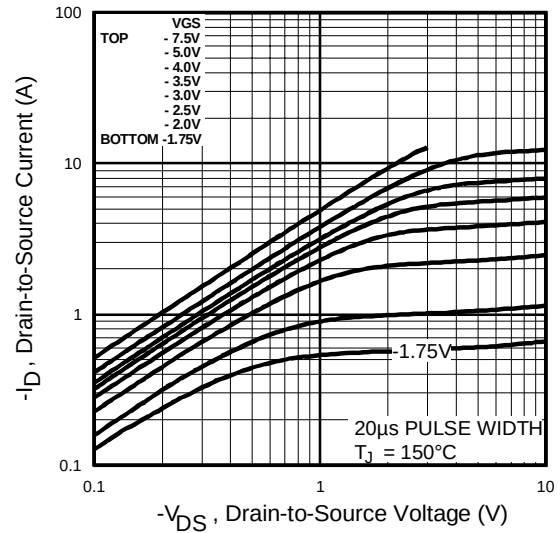


Fig 2. Typical Output Characteristics

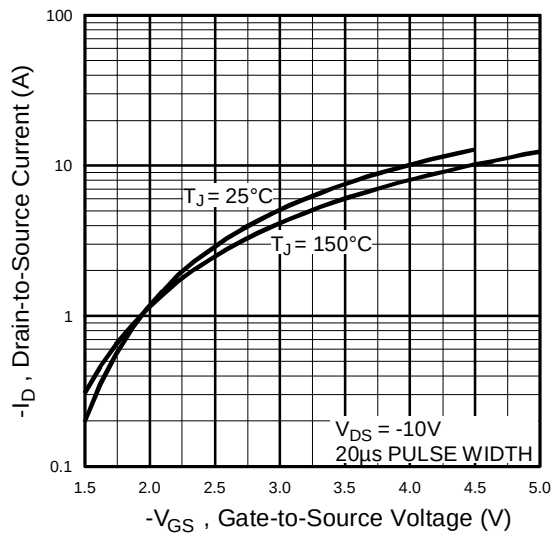


Fig 3. Typical Transfer Characteristics

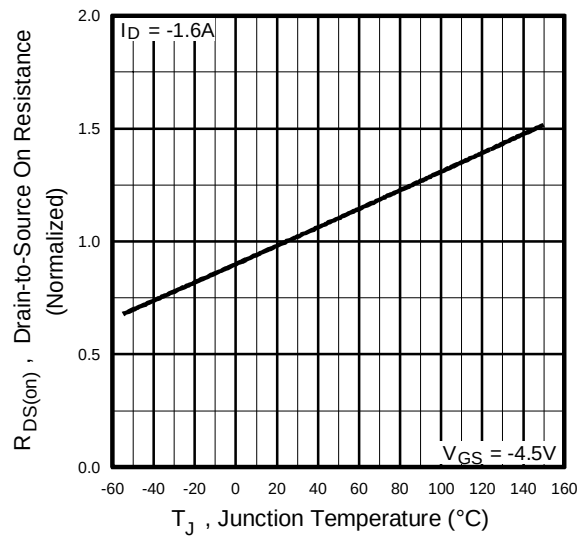


Fig 4. Normalized On-Resistance
Vs. Temperature

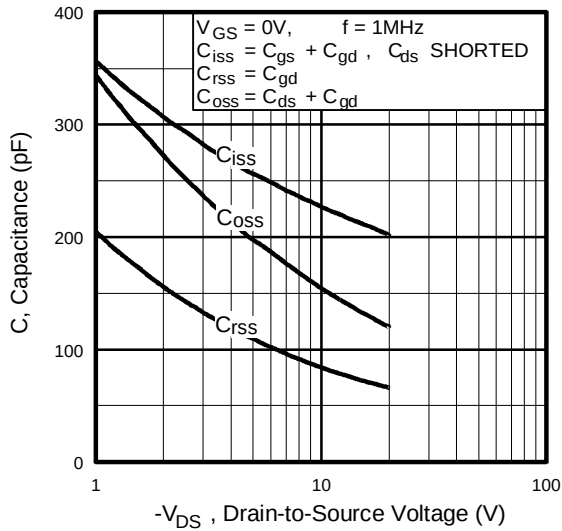


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

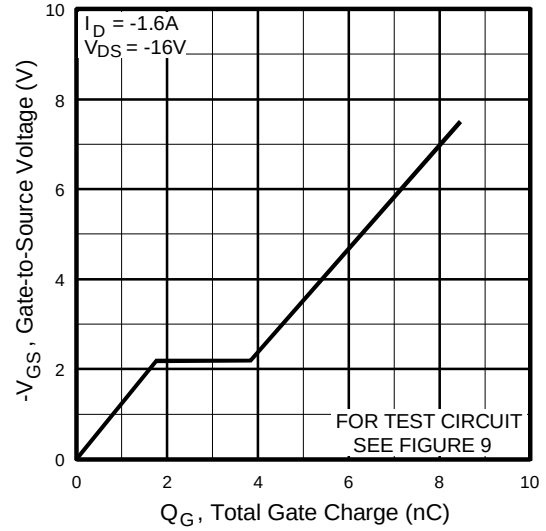


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

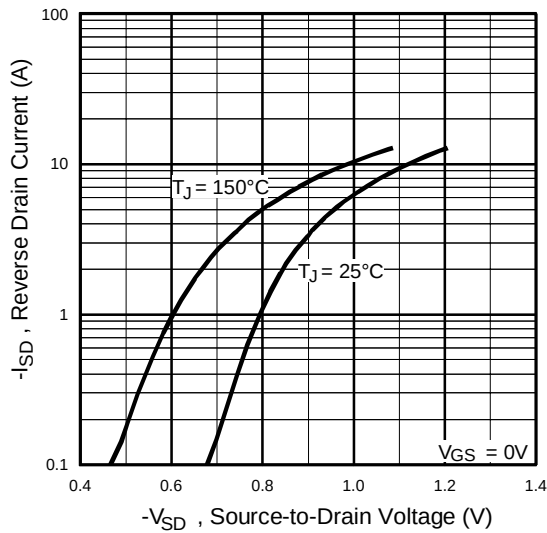


Fig 7. Typical Source-Drain Diode Forward Voltage

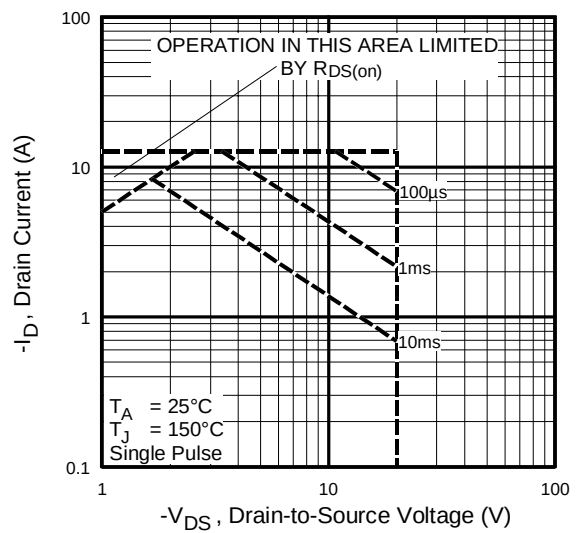


Fig 8. Maximum Safe Operating Area

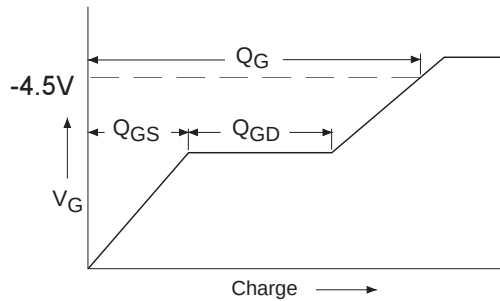


Fig 9a. Basic Gate Charge Waveform

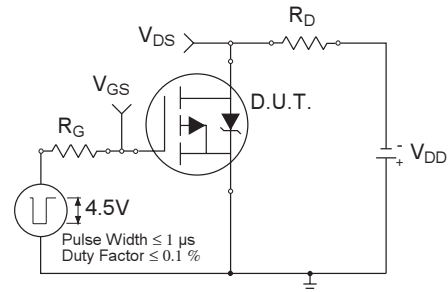


Fig 10a. Switching Time Test Circuit

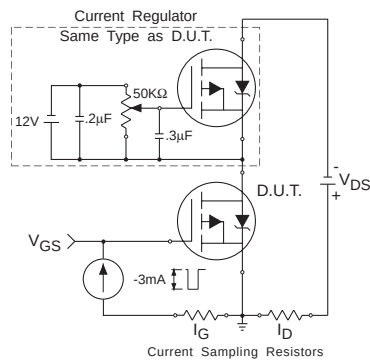


Fig 9b. Gate Charge Test Circuit

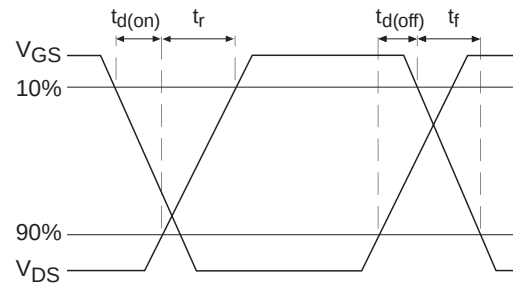


Fig 10b. Switching Time Waveforms

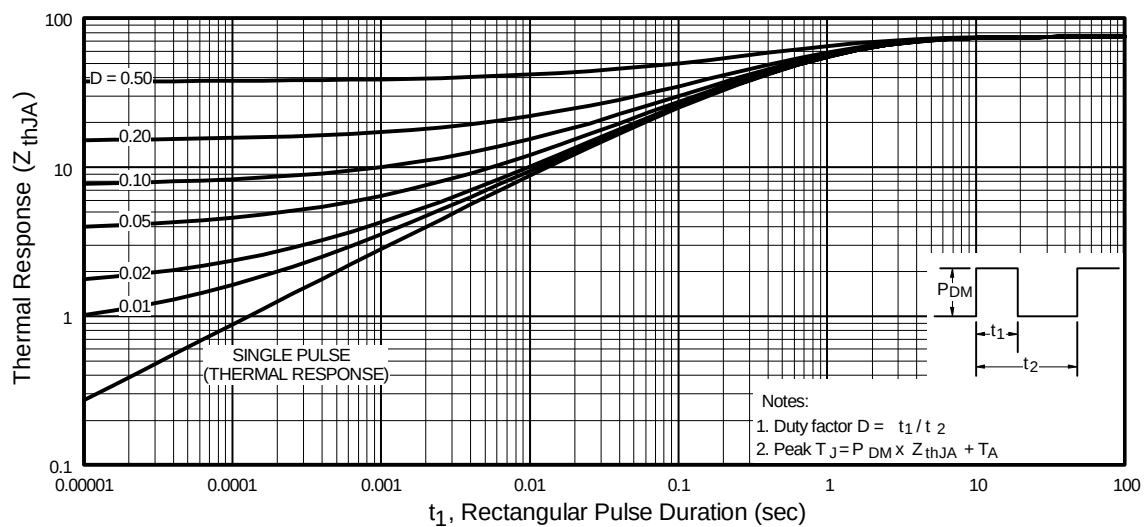
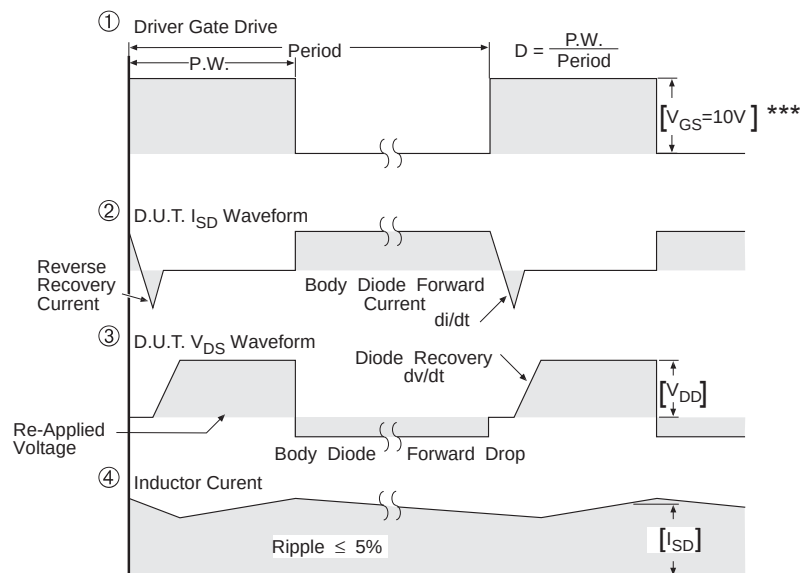
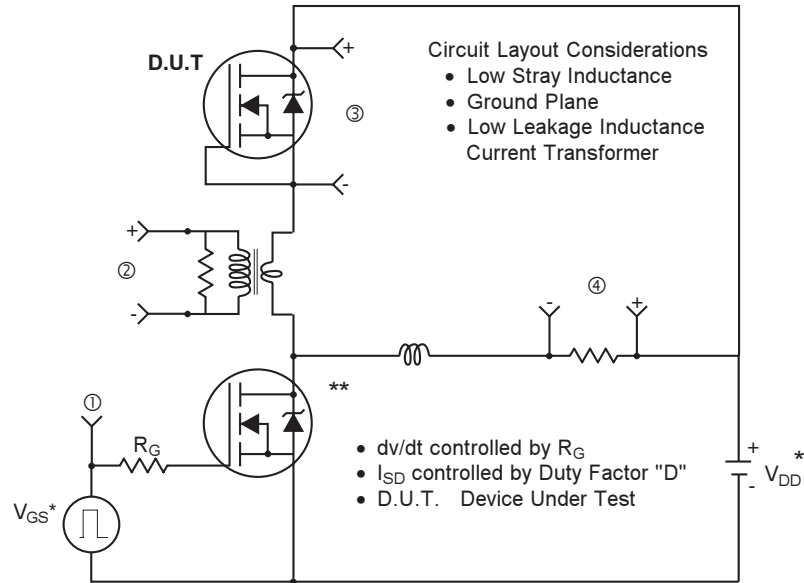


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Peak Diode Recovery dv/dt Test Circuit

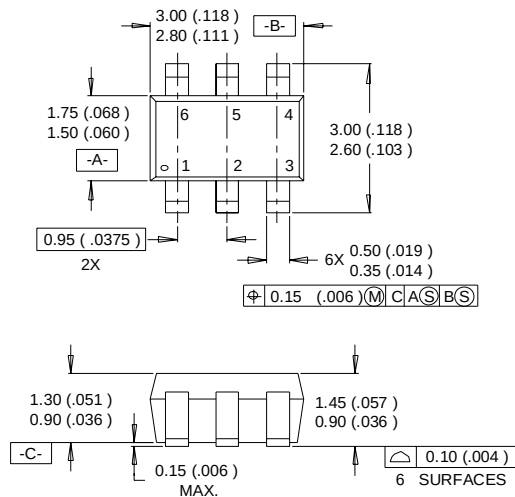


*** $V_{GS} = 5.0V$ for Logic Level and 3V Drive Devices

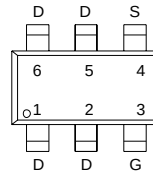
Fig 12. For P-channel HEXFET® power MOSFETs

International
IR Rectifier
Package Outline
Micro6™

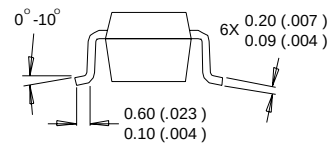
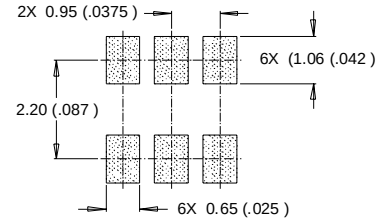
IRLMS6702



LEAD ASSIGNMENTS



RECOMMENDED FOOTPRINT



NOTES :

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

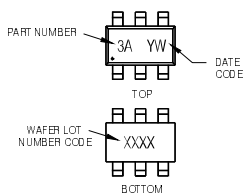
Part Marking Information

Micro6™

Notes: This part marking information applies to devices produced before 02/26/200

EXAMPLE: THIS IS AN IRLMS6702

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



PART NUMBER CODE REFERENCE:

2A - IRLMS1902
 2B - IRLMS1503
 2C - IRLMS6702
 2D - IRLMS6703
 2E - IRLMS6802
 2F - IRLMS4502
 2G - IRLMS2002
 2H - IRLMS6803

DATE CODE EXAMPLES:

YWW - 9603 - 6C
 YWW - 9632 - FF

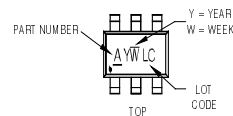
YEAR	Y	WORK WEEK	W
2001	1	01	A
2002	2	02	B
2003	3	03	C
2004	4	04	D
2005	5		
1996	6		
1997	7		
1998	8		
1999	9		
2000	0	24	X
		25	Y
		26	Z

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	50	X
2000	K	51	Y
		52	Z

Notes: This part marking information applies to devices produced after 02/26/200

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



PART NUMBER CODE REFERENCE:

A - IRLMS1902
 B - IRLMS1503
 C - IRLMS6702
 D - IRLMS6703
 E - IRLMS6802
 F - IRLMS4502
 G - IRLMS2002
 H - IRLMS6803

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

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

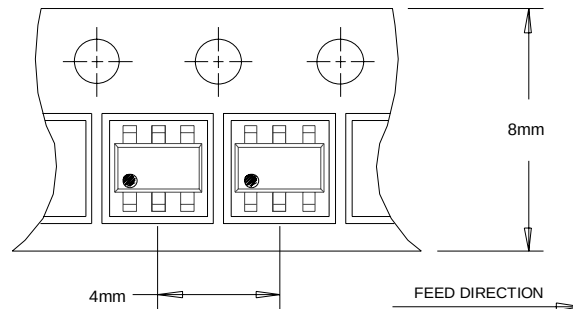
YEAR	Y	WORK WEEK	W
2001	A	27	A
2002	B	28	B
2003	C	29	C
2004	D	30	D
2005	E		
1996	F		
1997	G		
1998	H		
1999	J	50	X
2000	K	51	Y
		52	Z

IRLMS6702

International
IR Rectifier

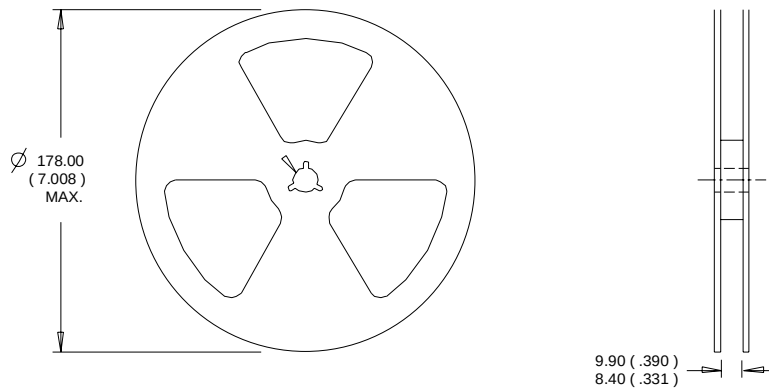
Tape & Reel Information

Micro6™



NOTES :

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



NOTES:

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

Data and specifications subject to change without notice.

International
IR Rectifier

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TAC Fax: (310) 252-7903

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