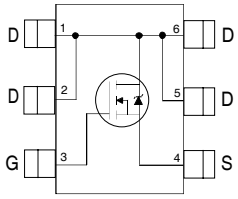
International
IOR Rectifier

IRLMS1503PbF-1

HEXFET® Power MOSFET

V_{DS}	30	V
$R_{DS(on)\ max}$ ($@V_{GS}$ = 10V)	0.10	Ω
$R_{DS(on)\ max}$ ($@V_{GS}$ = 4.5V)	0.20	Ω
$Q_{g\ (typical)}$	6.4	nC
I_D ($@T_A$ = 25°C)	3.2	A



Top View


Micro6™

Features

Industry-standard pinout Micro-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	
IRLMS1503TRPbF-1	Micro6™	Tape and Reel	3000	IRLMS1503TRPbF-1

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	3.2	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	2.6	
I_{DM}	Pulsed Drain Current ①	18	
P_D @T_A = 25°C	Power Dissipation	1.7	W
	Linear Derating Factor	13	mW/°C
V_{GS}	Gate-to-Source Voltage	± 20	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

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Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	30	–––	–––	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	–––	0.037	–––	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	–––	–––	0.100	Ω	V_{GS} = 10V, I_D = 2.2A ③
		–––	–––	0.20		V_{GS} = 4.5V, I_D = 1.1A ③
$V_{GS(th)}$	Gate Threshold Voltage	1.0	–––	–––	V	V_{DS} = V_{GS}, I_D = 250µA
g_{fs}	Forward Transconductance	1.1	–––	–––	S	V_{DS} = 10V, I_D = 1.1A
I_{DSS}	Drain-to-Source Leakage Current	–––	–––	1.0	µA	V_{DS} = 24V, V_{GS} = 0V
		–––	–––	25		V_{DS} = 24V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	–––	–––	-100	nA	V_{GS} = -20V
	Gate-to-Source Reverse Leakage	–––	–––	100		V_{GS} = 20V
Q_g	Total Gate Charge	–––	6.4	9.6	nC	I_D = 2.2A
Q_{gs}	Gate-to-Source Charge	–––	1.1	1.7		V_{DS} = 24V
Q_{gd}	Gate-to-Drain ("Miller") Charge	–––	1.9	2.8		V_{GS} = 10V, See Fig. 6 and 9 ③
$t_{d(on)}$	Turn-On Delay Time	–––	4.6	–––	ns	V_{DD} = 15V
t_r	Rise Time	–––	4.4	–––		I_D = 2.2A
$t_{d(off)}$	Turn-Off Delay Time	–––	10	–––		R_G = 6.0Ω
t_f	Fall Time	–––	2.0	–––		R_D = 6.7Ω, See Fig. 10 ③
C_{iss}	Input Capacitance	–––	210	–––	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	–––	90	–––		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	–––	32	–––		f = 1.0MHz, 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	–––	–––	18		
V_{SD}	Diode Forward Voltage	–––	–––	1.2	V	T_J = 25°C, I_S = 2.2A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	–––	36	54	ns	T_J = 25°C, I_F = 2.2A
Q_{rr}	Reverse RecoveryCharge	–––	39	58	nC	di/dt = 100A/µs ③

Notes:

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

② I_{SD} ≤ 2.2A, di/dt ≤ 150A/µs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C

③ Pulse width ≤ 300µs; duty cycle ≤ 2%.

④ Surface mounted on FR-4 board, t ≤ 5sec.

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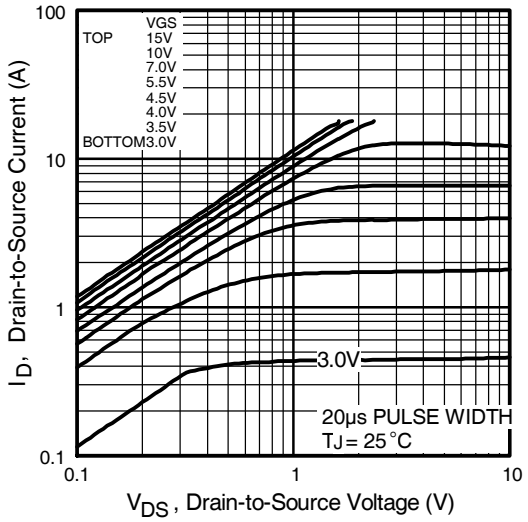

Fig 1. Typical Output Characteristics

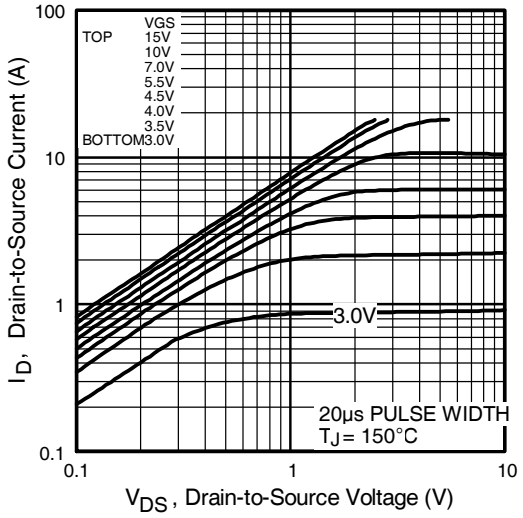

Fig 2. Typical Output Characteristics

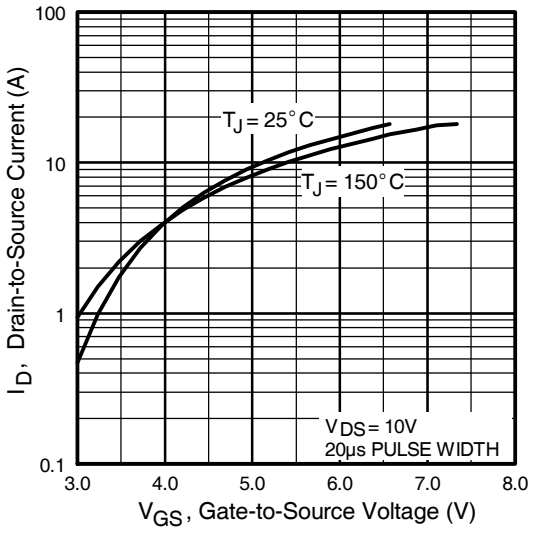

Fig 3. Typical Transfer Characteristics

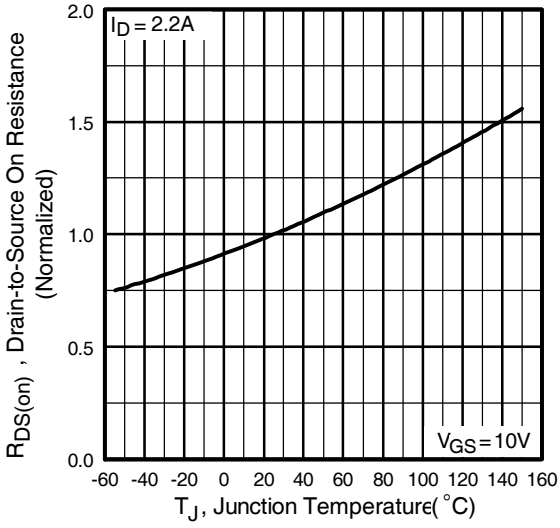

Fig 4. Normalized On-Resistance Vs. Temperature

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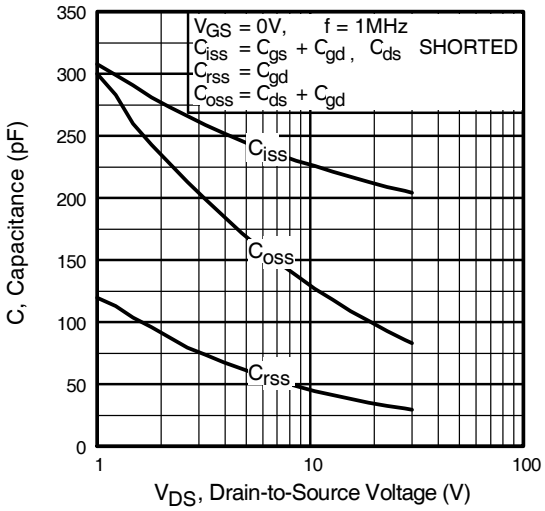

Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

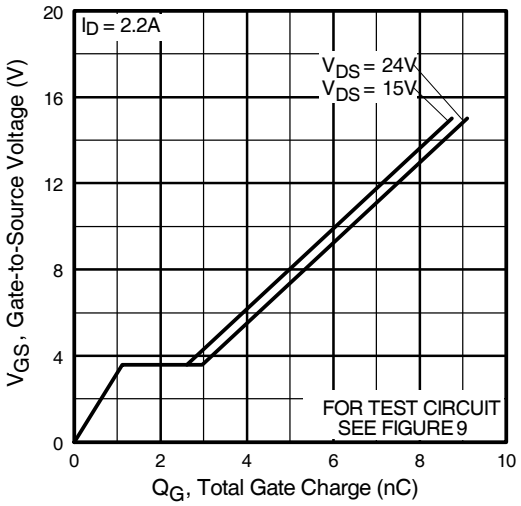

Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

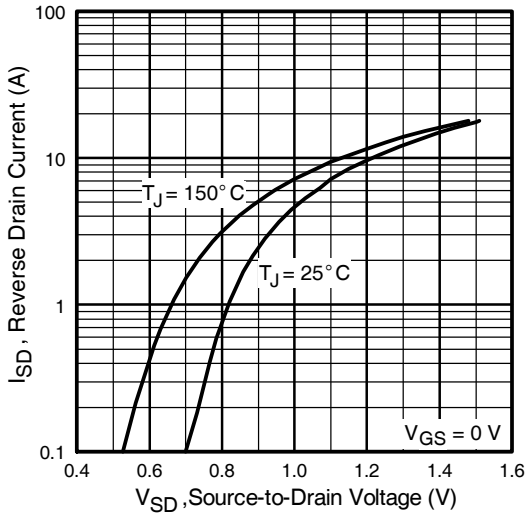

Fig 7. Typical Source-Drain Diode Forward Voltage

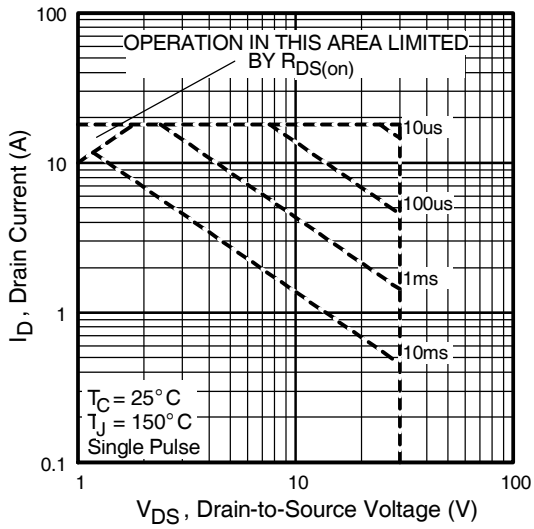

Fig 8. Maximum Safe Operating Area

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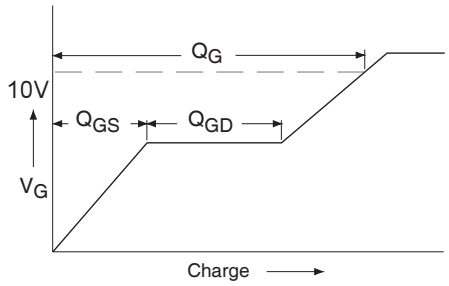

Fig 9a. Basic Gate Charge Waveform

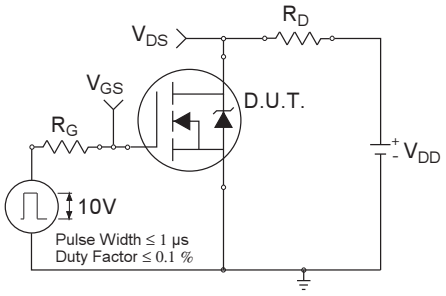

Fig 10a. Switching Time Test Circuit

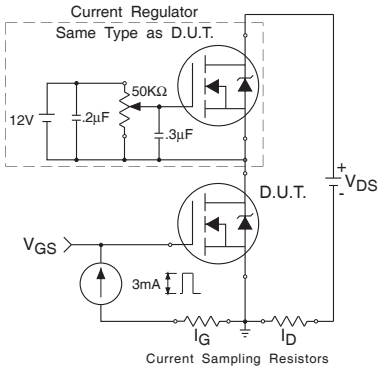

Fig 9b. Gate Charge Test Circuit

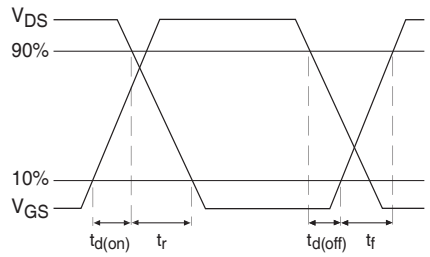

Fig 10b. Switching Time Waveforms

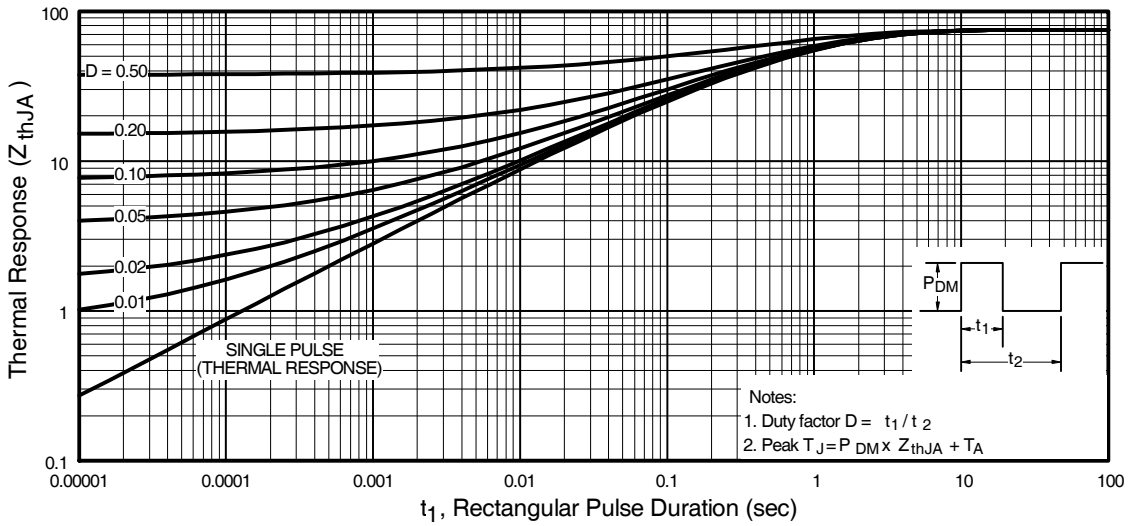

Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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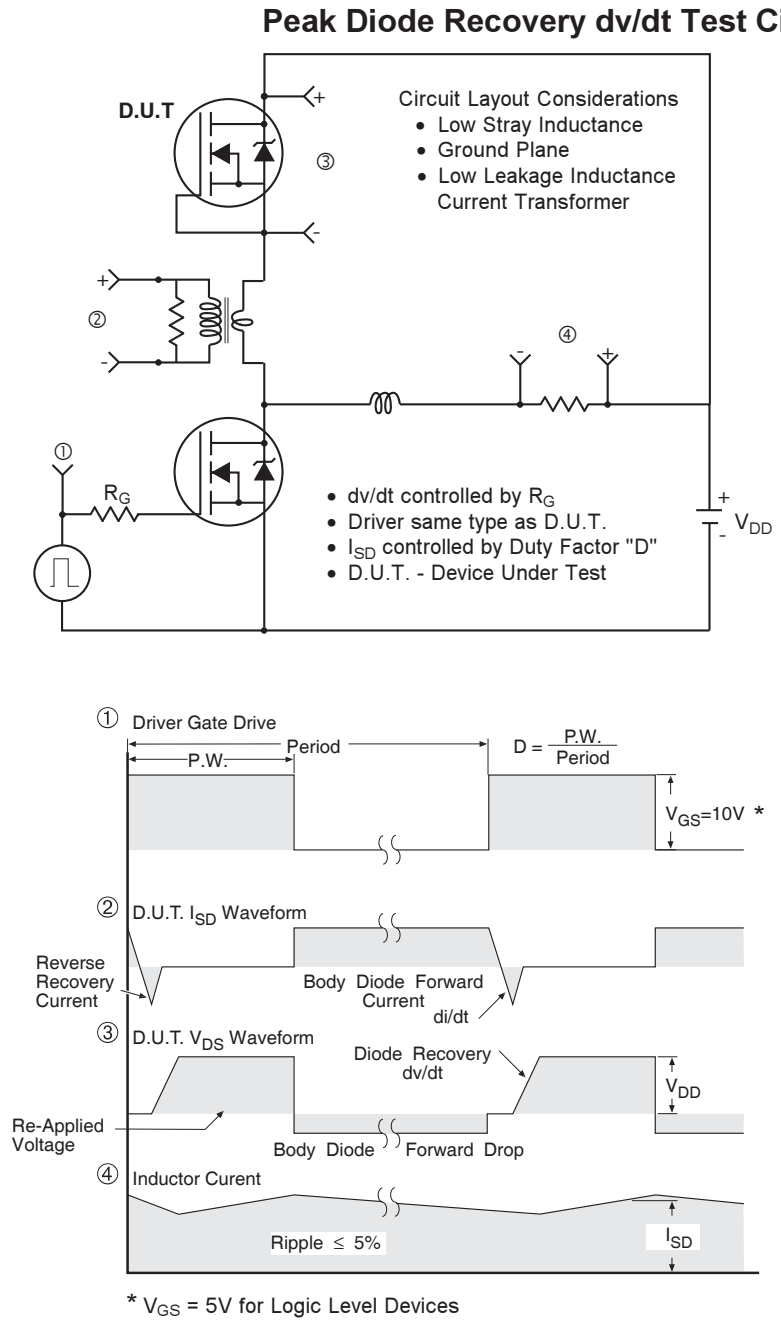

Fig 13. For N-channel HEXFET® power MOSFET s

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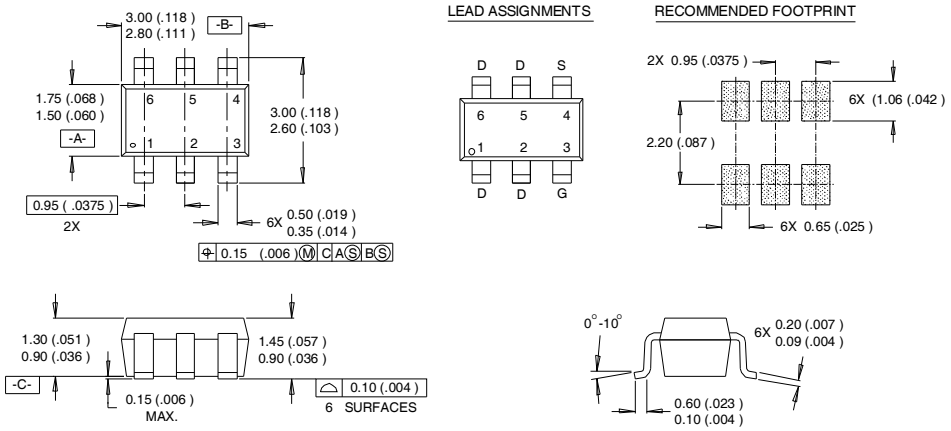
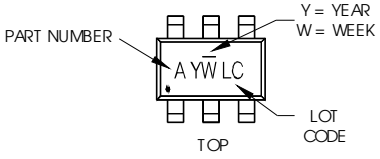
Micro6 (SOT23 6L) Package Outline

Dimensions are shown in milimeters (inches)



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

Micro6 (SOT23 6L) Part Marking Information



PART NUMBER CODE REFERENCE:

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

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		
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/

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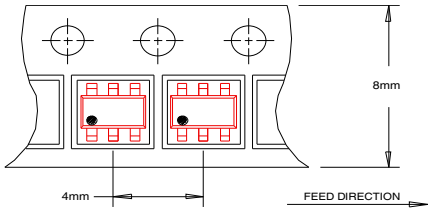
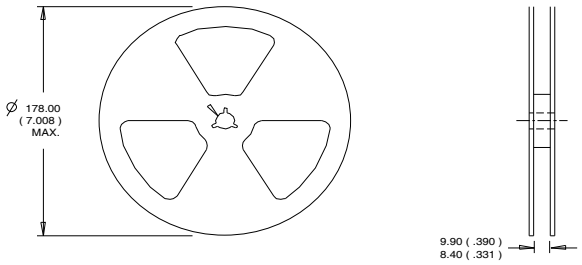
Micro6 Tape & Reel Information (Dimensions are shown in milimeters (inches))



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/

Qualification information†

Qualification level	Industrial (per JEDEC JESD47F†† guidelines)	
Moisture Sensitivity Level	Micro6™	MSL1 (per JEDEC J-STD-020D††)
RoHS compliant	Yes	

† Qualification standards can be found at International Rectifier's web site: http://www.irf.com/product-info/reliability
†† Applicable version of JEDEC standard at the time of product release

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