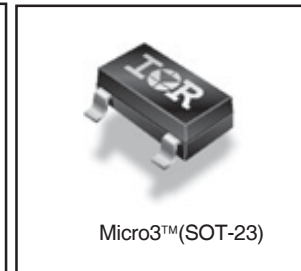
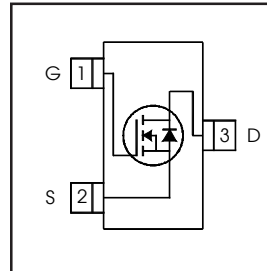


HEXFET® Power MOSFET

V_{DS}	20	V
$R_{DS(on) \max}$ (@ $V_{GS} = 4.5V$)	0.045	Ω
Q_g (typical)	8.0	nC
I_D (@ $T_A = 25^\circ C$)	4.2	A



Features

Industry-standard pinout SOT-23 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	
IRLML2502TRPbF-1	Micro3™ (SOT-23)	Tape and Reel	3000	IRLML2502TRPbF-1

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain- Source Voltage	20	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V$	4.2	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V$	3.4	
I_{DM}	Pulsed Drain Current ①	33	
$P_D @ T_A = 25^\circ C$	Power Dissipation	1.25	W
$P_D @ T_A = 70^\circ C$	Power Dissipation	0.8	
	Linear Derating Factor	0.01	
V_{GS}	Gate-to-Source Voltage	± 12	V
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	$^\circ C$

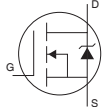
Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient②	75	100	$^\circ C/W$

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

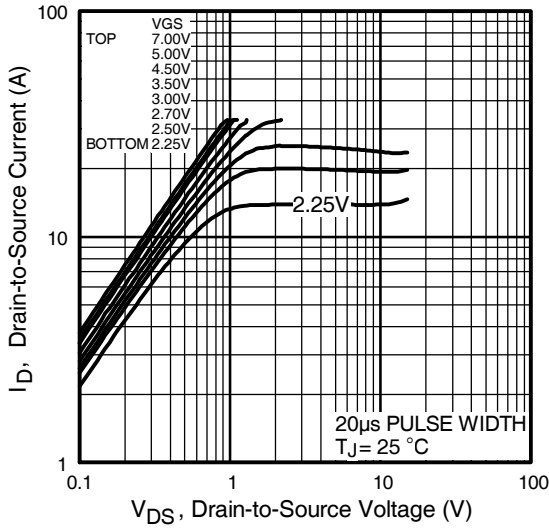
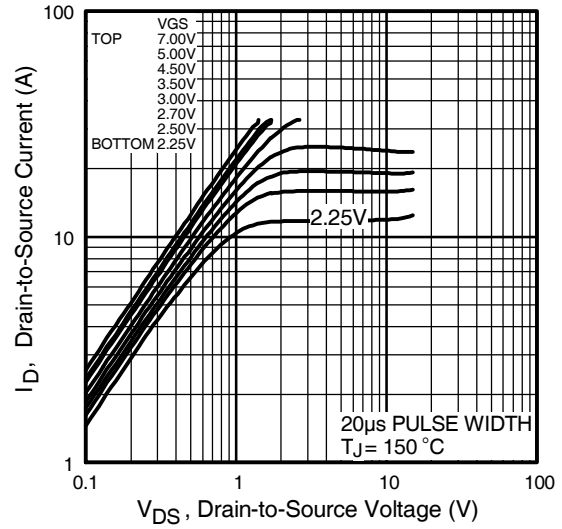
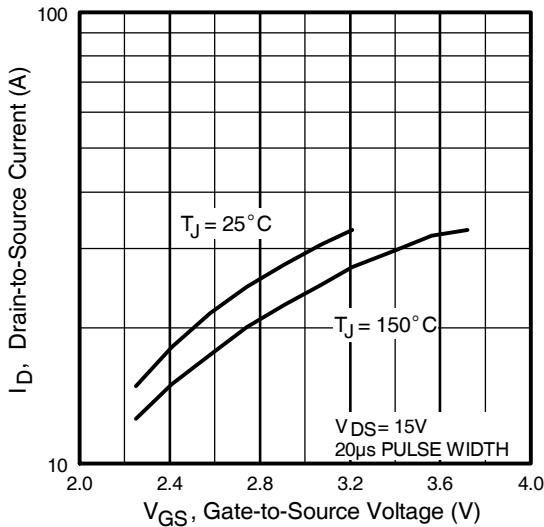
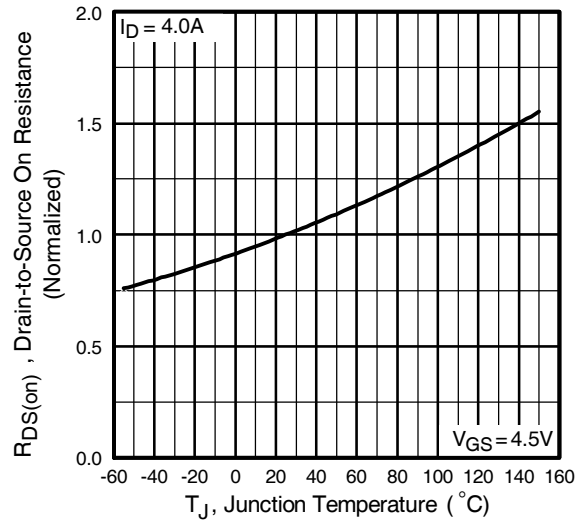
	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	20	—	—	V	V _{GS} = 0V, I _D = 250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	—	0.01	—	V/°C	Reference to 25°C, I _D = 1.0mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	0.035	0.045	Ω	V _{GS} = 4.5V, I _D = 4.2A ②
		—	0.050	0.080		V _{GS} = 2.5V, I _D = 3.6A ②
V _{GS(th)}	Gate Threshold Voltage	0.60	—	1.2	V	V _{DS} = V _{GS} , I _D = 250μA
ΔV _{GS(th)}	Gate Threshold Voltage Coefficient	—	-3.2	—	mV/°C	
g _{fs}	Forward Transconductance	5.8	—	—	S	V _{DS} = 10V, I _D = 4.0A
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 = 70°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	—	8.0	12	nC	I _D = 4.0A
Q _{gs}	Gate-to-Source Charge	—	1.8	2.7		V _{DS} = 10V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	1.7	2.6		V _{GS} = 5.0V ②
t _{d(on)}	Turn-On Delay Time	—	7.5	—	ns	V _{DD} = 10V
t _r	Rise Time	—	10	—		I _D = 1.0A
t _{d(off)}	Turn-Off Delay Time	—	54	—		R _G = 6Ω
t _f	Fall Time	—	26	—		R _D = 10Ω ②
C _{iss}	Input Capacitance	—	740	—	pF	V _{GS} = 0V
C _{oss}	Output Capacitance	—	90	—		V _{DS} = 15V
C _{rss}	Reverse Transfer Capacitance	—	66	—		f = 1.0MHz

Source-Drain Rating and Characteristics

	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. 
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	33		
V _{SD}	Diode Forward Voltage	—	—	1.2	V	T _J = 25°C, I _S = 1.3A, V _{GS} = 0V ②
t _{rr}	Reverse Recovery Time	—	16	24	ns	T _J = 25°C, I _F = 1.3A
Q _{rr}	Reverse Recovery Charge	—	8.6	13	nC	di/dt = 100A/μs ②

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)
- ② Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ③ Surface mounted on FR-4 board, t ≤ 5sec.


Fig 1. Typical Output Characteristics

Fig 2. Typical Output Characteristics

Fig 3. Typical Transfer Characteristics

Fig 4. Normalized On-Resistance Vs. Temperature

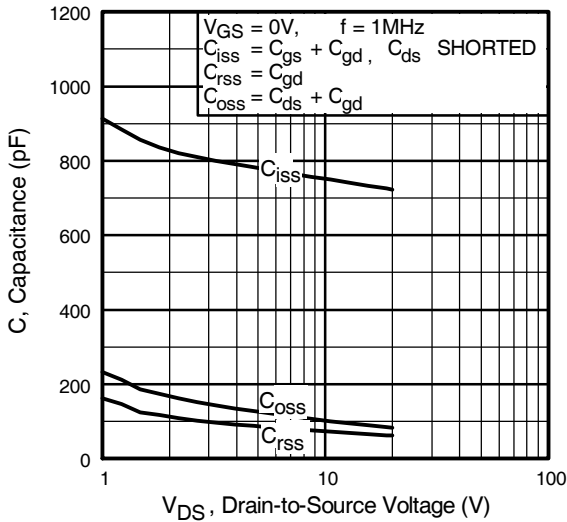


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

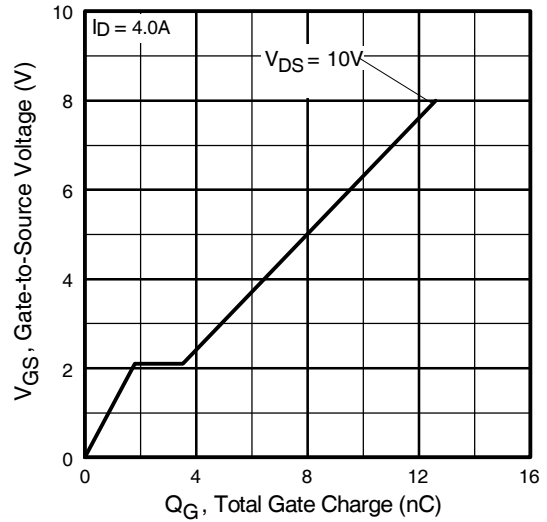


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

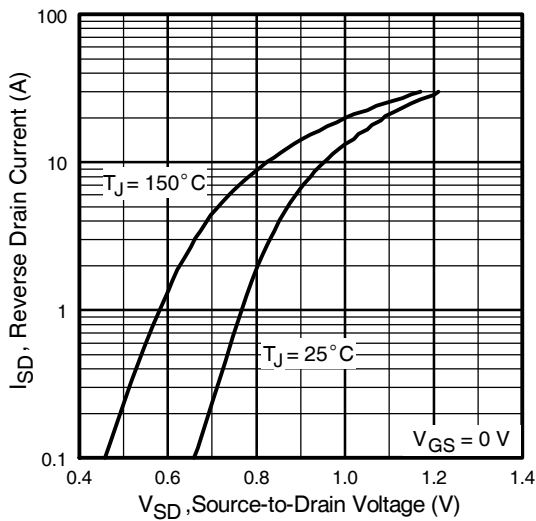


Fig 7. Typical Source-Drain Diode Forward Voltage

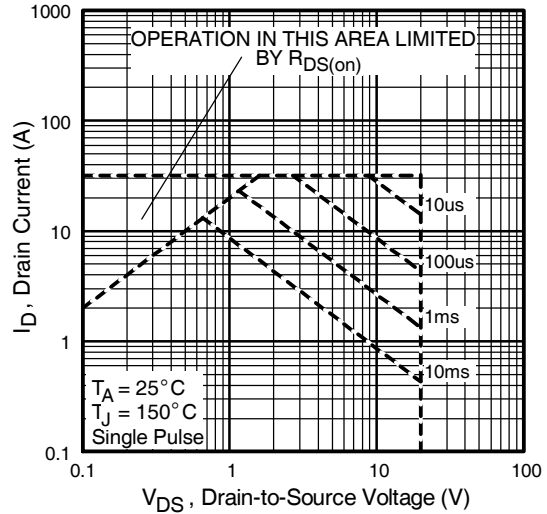


Fig 8. Maximum Safe Operating Area

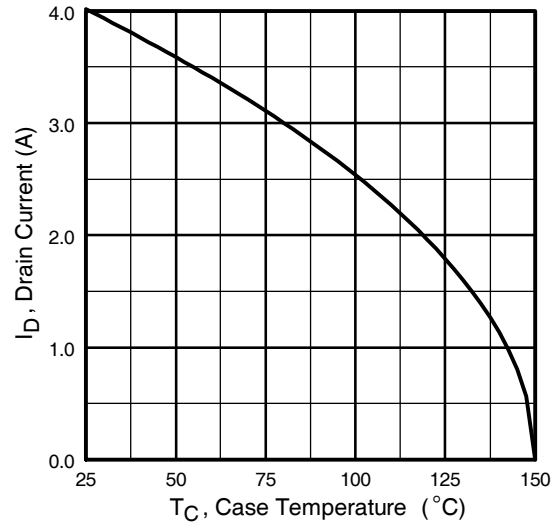


Fig 9. Maximum Drain Current Vs. Case Temperature

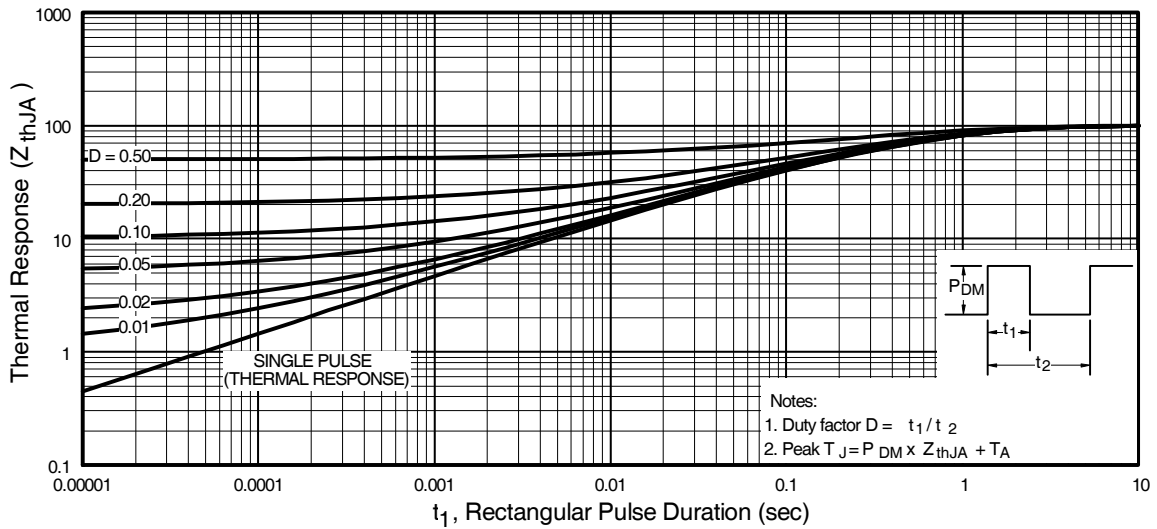
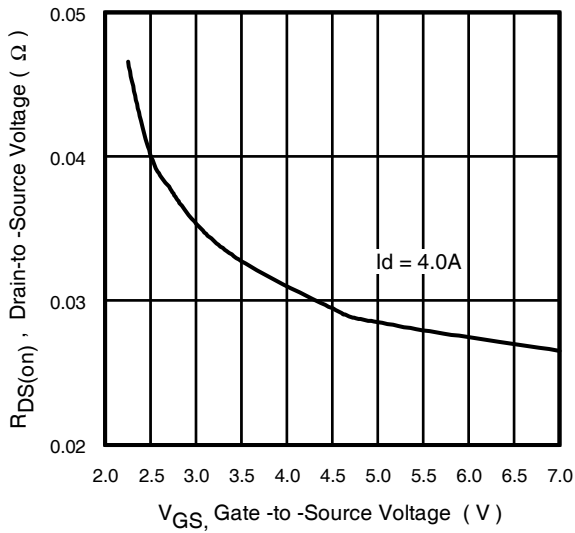
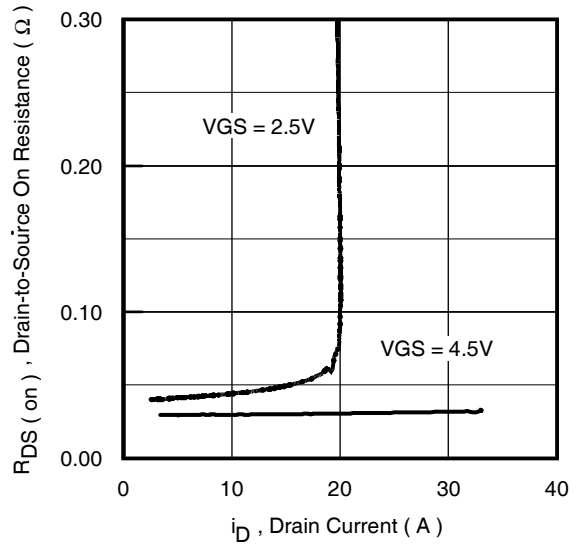
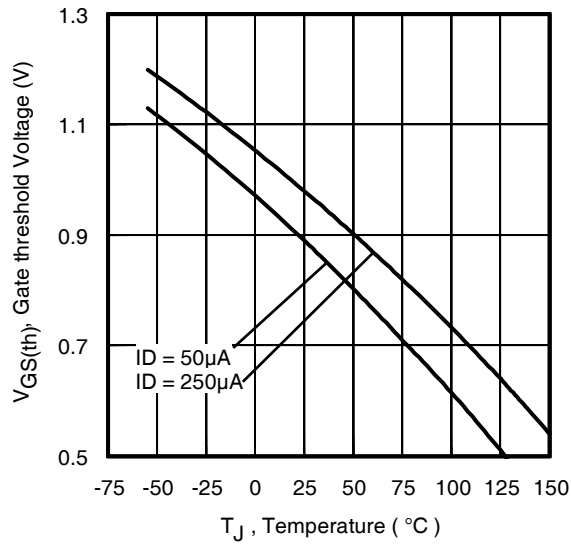


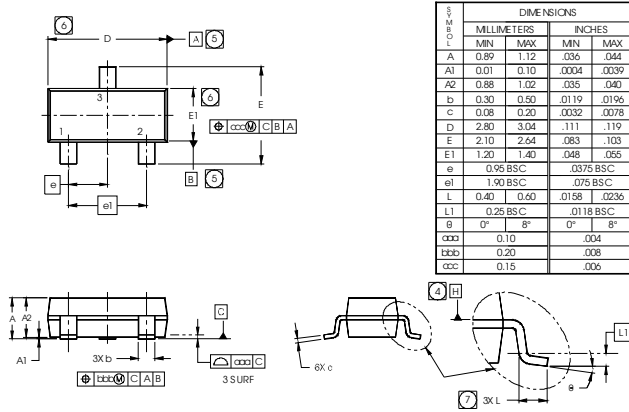
Fig 10. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient


Fig 11. On-Resistance Vs. Gate Voltage

Fig 12. On-Resistance Vs. Drain Current

Fig 13. Threshold Voltage Vs. Temperature



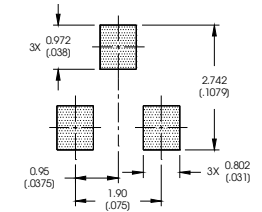
Micro3 (SOT-23) (Lead-Free) Package Outline

Dimensions are shown in millimeters (inches)



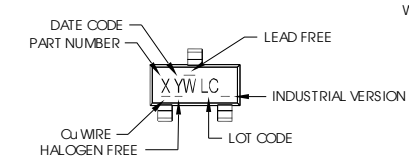
DIMENSIONS	DIMENSIONS			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.89	1.12	.036	.044
A1	0.01	0.10	.0004	.0039
A2	0.88	1.02	.035	.040
b	0.30	0.50	.0119	.0196
c	0.08	0.20	.0032	.0078
D	2.80	3.04	.111	.119
E	2.10	2.64	.083	.103
E1	1.20	1.40	.048	.055
e	0.95 BSC		.0375 BSC	
e1	1.90 BSC		.075 BSC	
L	0.40	0.60	.0158	.0236
L1	0.25 BSC		.0118 BSC	
B	0°	8°	0°	8°
ccc	0.10		.004	
bbb	0.20		.008	
ccc	0.15		.006	

RECOMMENDED FOOTPRINT



- NOTES
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
 2. DIMENSIONS ARE SHOWN IN MILLIMETERS AND 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.
 7. DIMENSION L IS THE LEAD LENGTH FOR SOLDERING TO A SUBSTRATE.
 8. OUTLINE CONFORMS TO JEDEC OUTLINE T-236AB.

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



- 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.

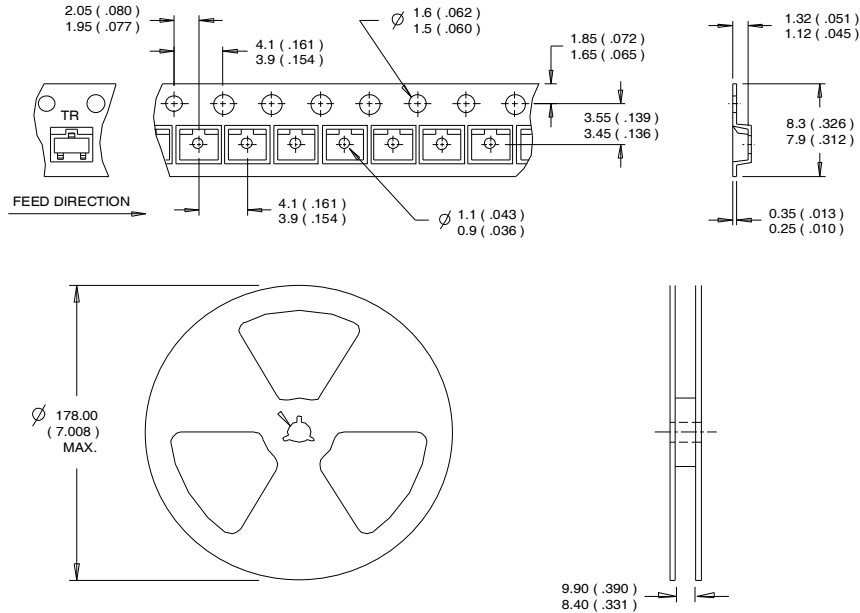
W = (1-26) IF PRECEDED BY LAST DIGIT OF CALENDAR YEAR

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

W = (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™ 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/>

Qualification information†

Qualification level	Industrial (per JEDEC JESD47F ^{††} guidelines)	
Moisture Sensitivity Level	Micro3™ (SOT-23)	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

Revision History

Date	Comment
10/28/2014	• Updated partmarking to reflect Industrial partmarking on page 7.

International
 Rectifier

IR WORLD HEADQUARTERS: 101 N. Sepulveda Blvd., El Segundo, California 90245, USA
 To contact International Rectifier, please visit <http://www.irf.com/whoto-call/>