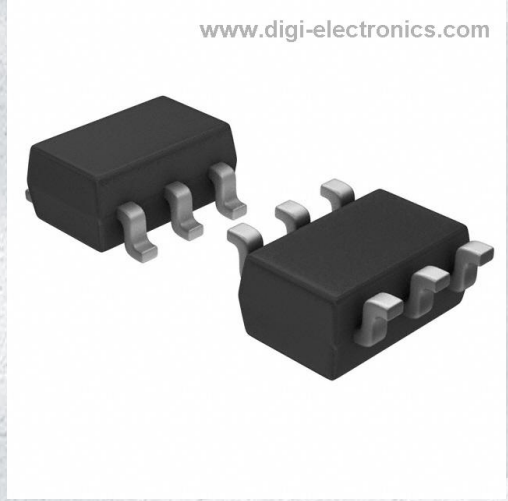
IRLMS1902TRPBF Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	IRLMS1902TRPBF-DG
Manufacturer	Infineon Technologies
Manufacturer Product Number	IRLMS1902TRPBF
Description	MOSFET N-CH 20V 3.2A MICRO6
Detailed Description	N-Channel 20 V 3.2A (Ta) 1.7W (Ta) Surface Mount Micro6™(TSOP-6)

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
IRLMS1902TRPBF	Infineon Technologies
Series:	Product Status:
HEXFET®	Obsolete
FET Type:	Technology:
N-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
20 V	3.2A (Ta)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
2.7V, 4.5V	100mOhm @ 2.2A, 4.5V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
700mV @ 250µA (Min)	7 nC @ 4.5 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±12V	300 pF @ 15 V
FET Feature:	Power Dissipation (Max):
-	1.7W (Ta)
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
Micro6™(TSOP-6)	SOT-23-6
Base Product Number:	
IRLMS1902	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0095	

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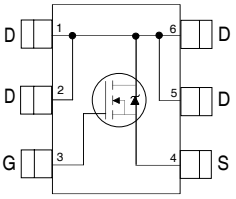
IOR Rectifier

PD - 95359

IRLMS1902PbF

HEXFET® Power MOSFET

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



Top View

V_{DSS} = 20V

$R_{DS(on)}$ = 0.10Ω


Micro6™

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. 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
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 4.5V	3.2	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 4.5V	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	± 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

IRLMS1902PbF

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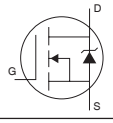
Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	20	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.032	—	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.10	Ω	V_{GS} = 4.5V, I_D = 2.2A ③
		—	—	0.17		V_{GS} = 2.7V, I_D = 1.1A ③
$V_{GS(th)}$	Gate Threshold Voltage	0.70	—	—	V	V_{DS} = V_{GS}, I_D = 250µA
g_{fs}	Forward Transconductance	3.2	—	—	S	V_{DS} = 10V, I_D = 1.1A
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°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	—	4.7	7.0	nC	I_D = 2.2A
Q_{gs}	Gate-to-Source Charge	—	0.97	1.5		V_{DS} = 16V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	1.8	2.6		V_{GS} = 4.5V, See Fig. 6 and 9 ③
$t_{d(on)}$	Turn-On Delay Time	—	7.0	—	ns	V_{DD} = 10V
t_r	Rise Time	—	11	—		I_D = 2.2A
$t_{d(off)}$	Turn-Off Delay Time	—	12	—		R_G = 6.0Ω
t_f	Fall Time	—	4.0	—		R_D = 4.4Ω, See Fig. 10 ③
C_{iss}	Input Capacitance	—	300	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	120	—		V_{DS} = 15V
C_{rss}	Reverse Transfer Capacitance	—	50	—		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 ②
t_{rr}	Reverse Recovery Time	—	40	60	ns	T_J = 25°C, I_F = 2.2A
Q_{rr}	Reverse Recovery Charge	—	37	55	nC	di/dt = 100A/µs ②



Notes:

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

② $I_{SD} \le 2.2A$, di/dt ≤ 110A/µs, $V_{DD} \le V_{(BR)DSS}$, $T_J \le 150°C$

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

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

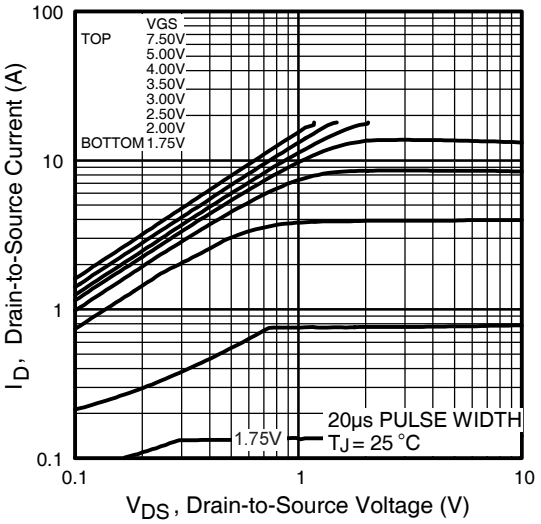


Fig 1. Typical Output Characteristics

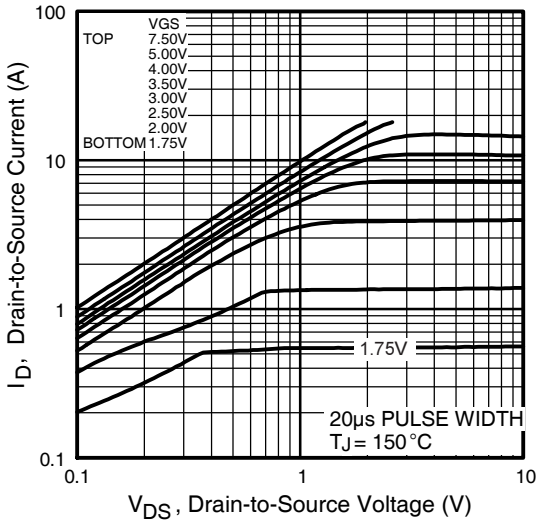


Fig 2. Typical Output Characteristics

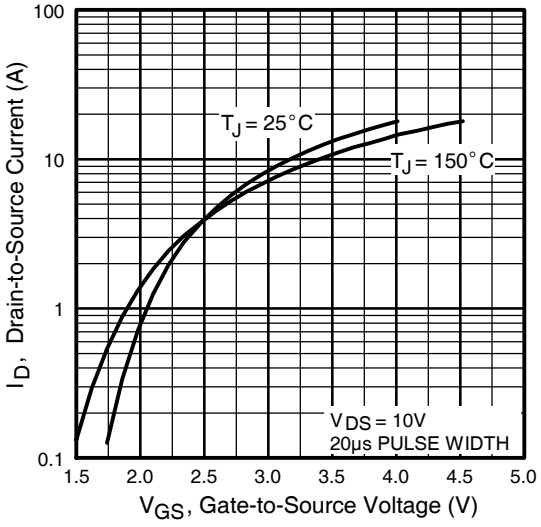


Fig 3. Typical Transfer Characteristics

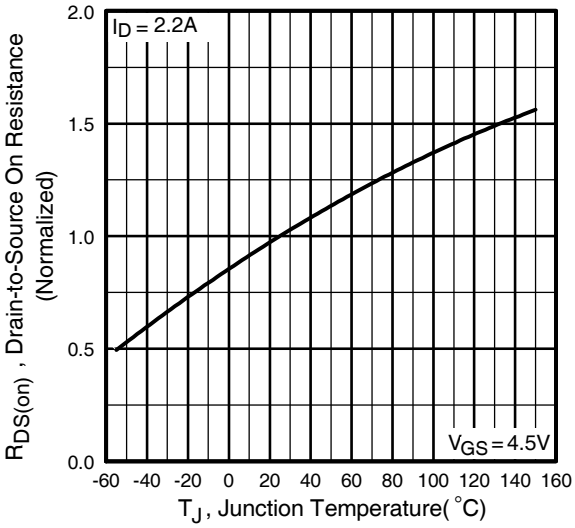


Fig 4. Normalized On-Resistance Vs. Temperature

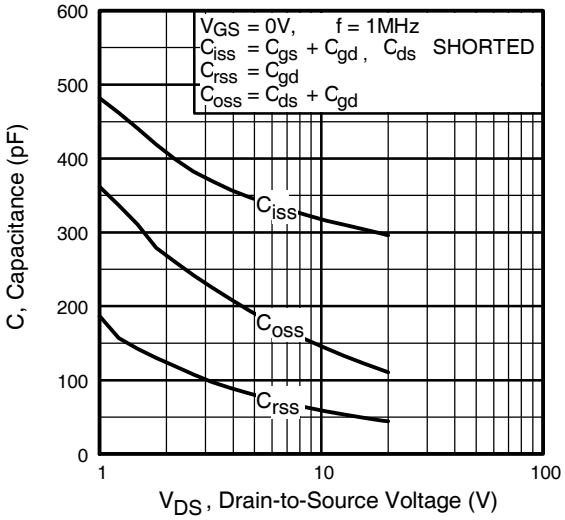


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

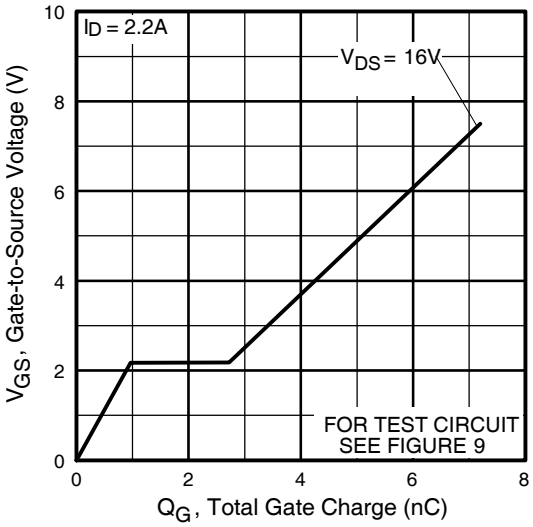


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

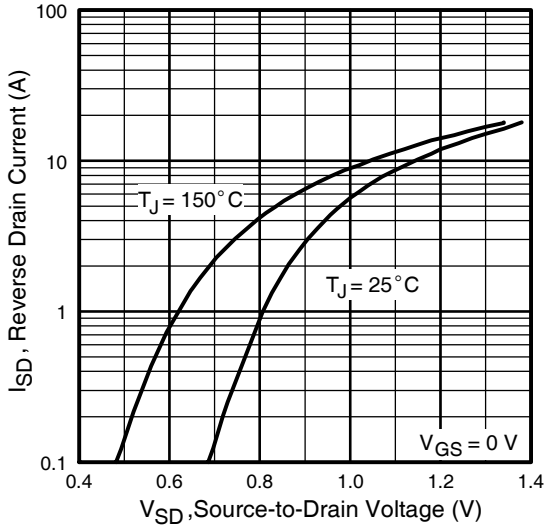


Fig 7. Typical Source-Drain Diode Forward Voltage

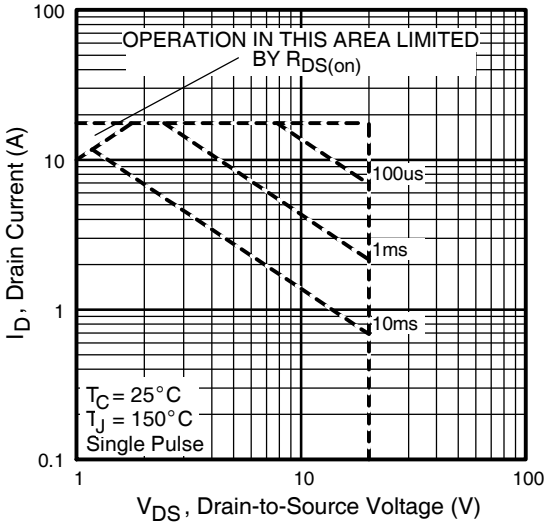


Fig 8. Maximum Safe Operating Area

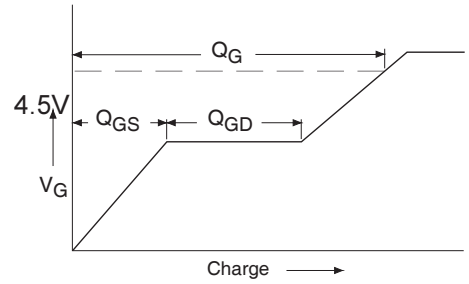


Fig 9a. Basic Gate Charge Waveform

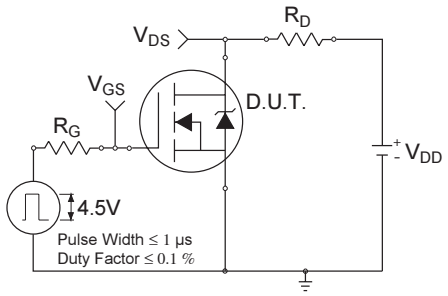


Fig 10a. Switching Time Test Circuit

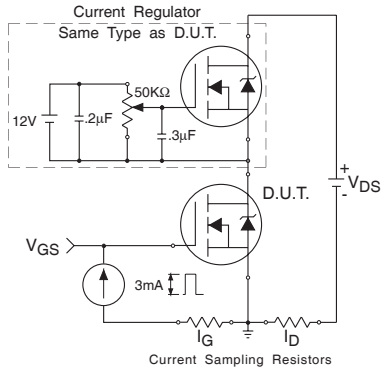


Fig 9b. Gate Charge Test Circuit

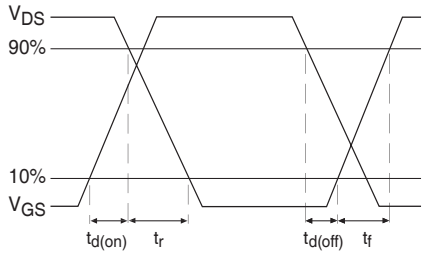


Fig 10b. Switching Time Waveforms

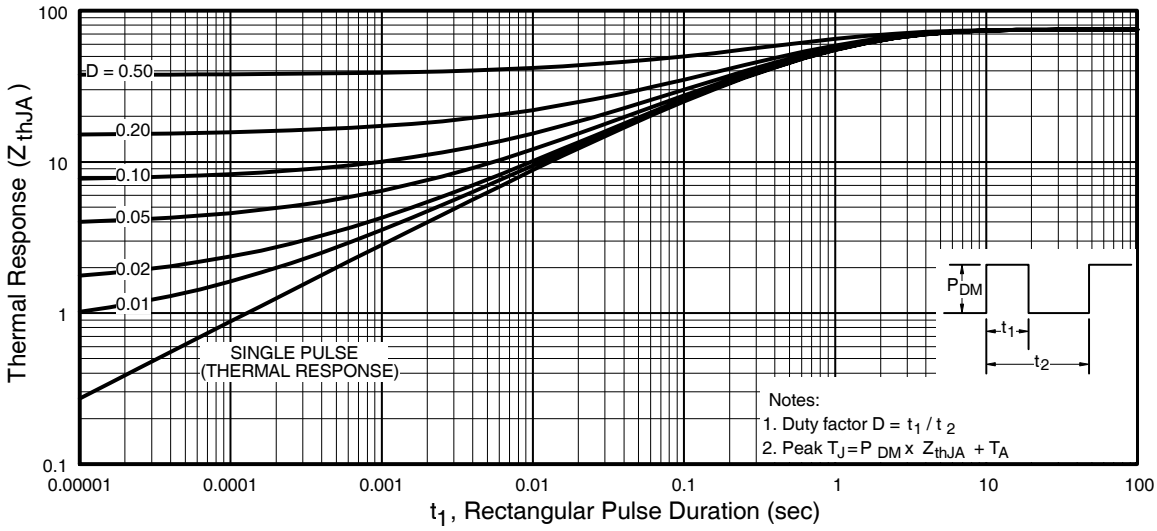


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

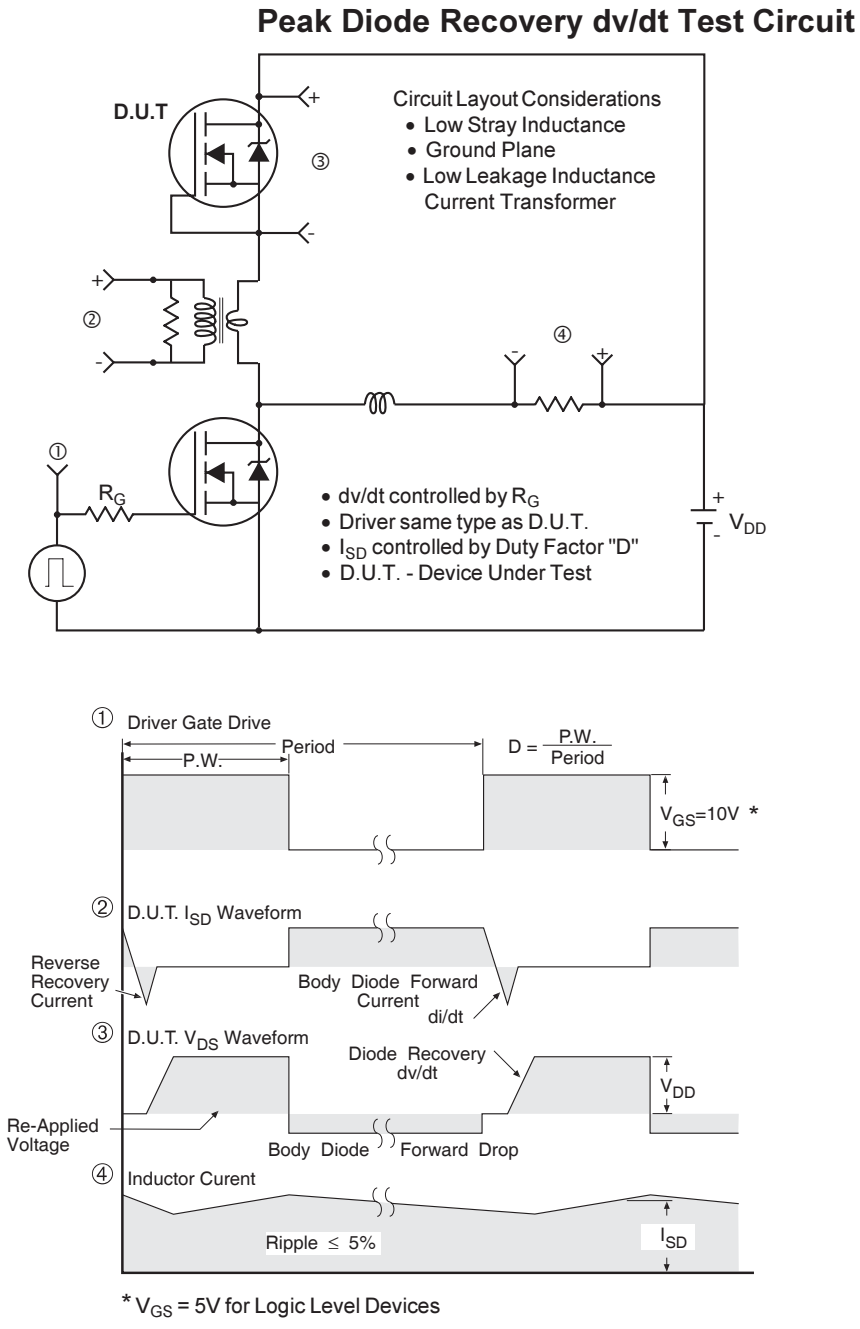


Fig 12. For N-channel HEXFET® power MOSFETs

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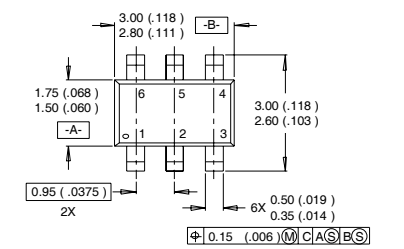
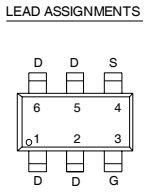
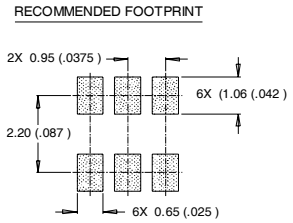
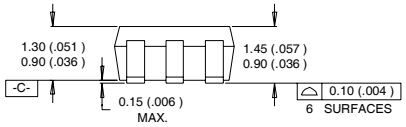
Micro6 (SOT23 6L) Package Outline

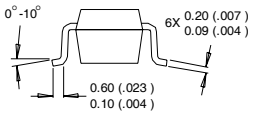
Dimensions are shown in milimeters (inches)





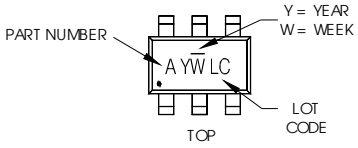






NOTES :
1. DIMENSIONING & TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION : MILLIMETER.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).

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

IRLMS1902PbF

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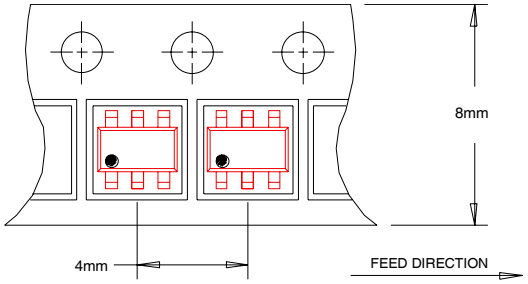
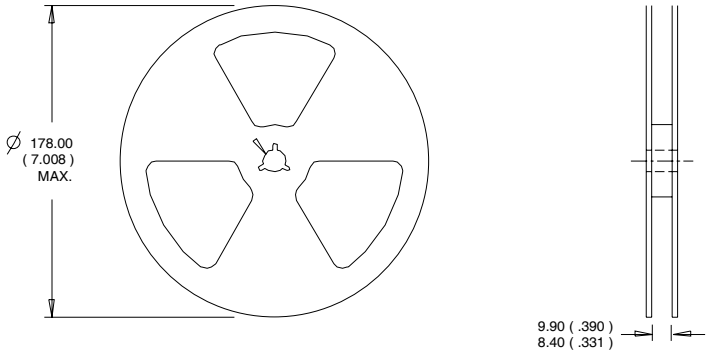
Micro6 Tape & Reel Information

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.

This product has been designed and qualified for the consumer market.
Qualification Standards can be found on IR's Web site.
Data and specifications subject to change without notice.

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TAC Fax: (310) 252-7903
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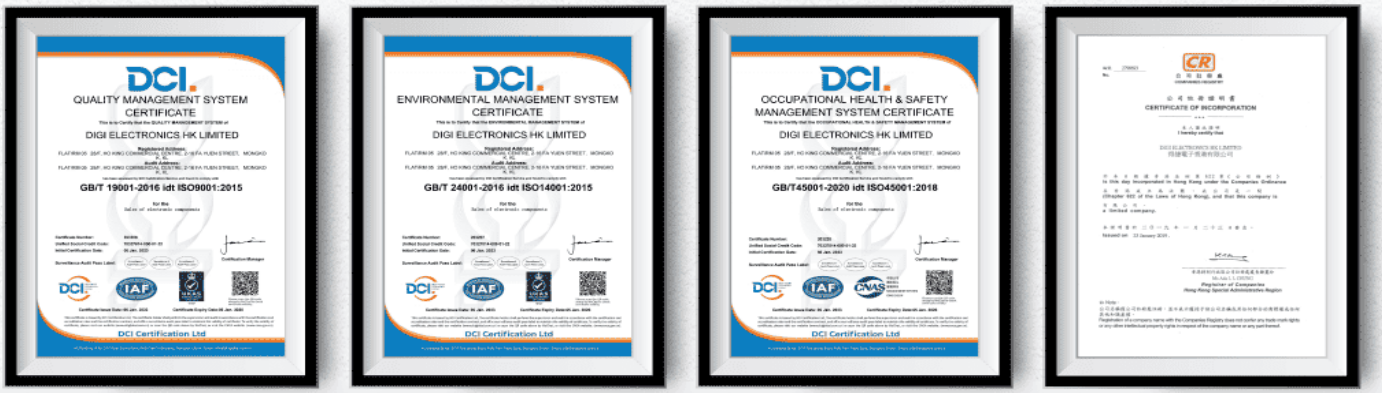

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