

IRF5805PbF

HEXFET[®] Power MOSFET

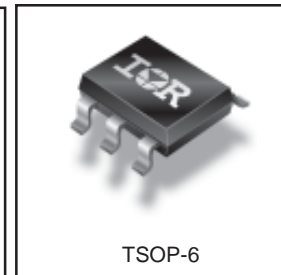
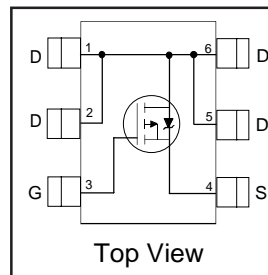
- Ultra Low On-Resistance
- P-Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- Low Gate Charge
- Lead-Free

V_{DS}	$R_{DS(on)}$ max	I_D
-30V	0.098@ $V_{GS} = -10V$	-3.8A
	0.165@ $V_{GS} = -4.5V$	-3.0A

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 TSOP-6 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	-30	V
I_D @ $T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V$	-3.8	A
I_D @ $T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ -10V$	-3.0	
I_{DM}	Pulsed Drain Current ^①	-15	
P_D @ $T_A = 25^\circ C$	Maximum Power Dissipation ^③	2	W
P_D @ $T_A = 70^\circ C$	Maximum Power Dissipation ^③	1.28	W
	Linear Derating Factor	0.02	W/ $^\circ C$
V_{GS}	Gate-to-Source Voltage	± 20	V
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	$^\circ C$

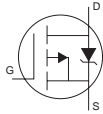
Thermal Resistance

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ^③	62.5	$^\circ C/W$

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	-30	—	—	V	V _{GS} = 0V, I _D = -250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient	—	0.02	—	V/°C	Reference to 25°C, I _D = -1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	—	0.098	Ω	V _{GS} = -10V, I _D = -3.8A ②
		—	—	0.165		V _{GS} = -4.5V, I _D = -3.0A ②
V _{GS(th)}	Gate Threshold Voltage	-1.0	—	-2.5	V	V _{DS} = V _{GS} , I _D = -250μA
g _{fs}	Forward Transconductance	3.5	—	—	S	V _{DS} = -10V, I _D = -3.8A
I _{DSS}	Drain-to-Source Leakage Current	—	—	-15	μA	V _{DS} = -24V, V _{GS} = 0V
		—	—	-25		V _{DS} = -24V, V _{GS} = 0V, T _J = 70°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	—	11	17	nC	I _D = -3.8A
Q _{gs}	Gate-to-Source Charge	—	2.3	—		V _{DS} = -15V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	1.5	—		V _{GS} = -10V
t _{d(on)}	Turn-On Delay Time	—	11	17	ns	V _{DD} = -15V, V _{GS} = -10V
t _r	Rise Time	—	14	21		I _D = -1.0A
t _{d(off)}	Turn-Off Delay Time	—	90	135		R _G = 6.0Ω
t _f	Fall Time	—	49	74		R _D = 15Ω ②
C _{iss}	Input Capacitance	—	511	—	pF	V _{GS} = 0V
C _{oss}	Output Capacitance	—	79	—		V _{DS} = -25V
C _{rss}	Reverse Transfer Capacitance	—	50	—		f = 1.0MHz

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	-2.0	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	-15		
V _{SD}	Diode Forward Voltage	—	—	-1.2	V	T _J = 25°C, I _S = -2.0A, V _{GS} = 0V ②
t _{rr}	Reverse Recovery Time	—	19	29	ns	T _J = 25°C, I _F = -2.0A
Q _{rr}	Reverse Recovery Charge	—	16	24	nC	di/dt = -100A/μs ②

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

② Pulse width ≤ 400μs; duty cycle ≤ 2%.

③ Surface mounted on 1 in square Cu board, t ≤ 10sec.

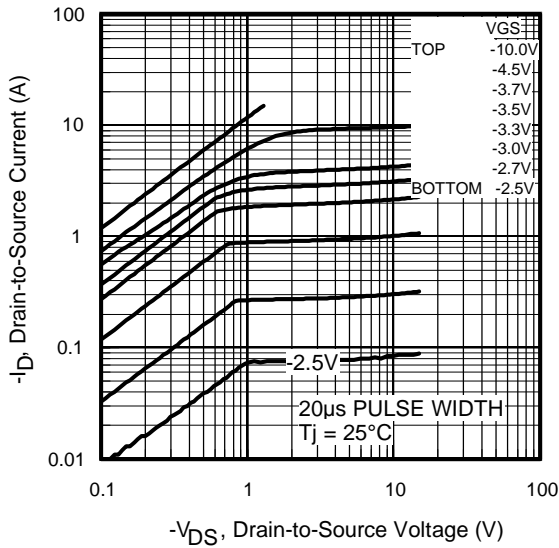


Fig 1. Typical Output Characteristics

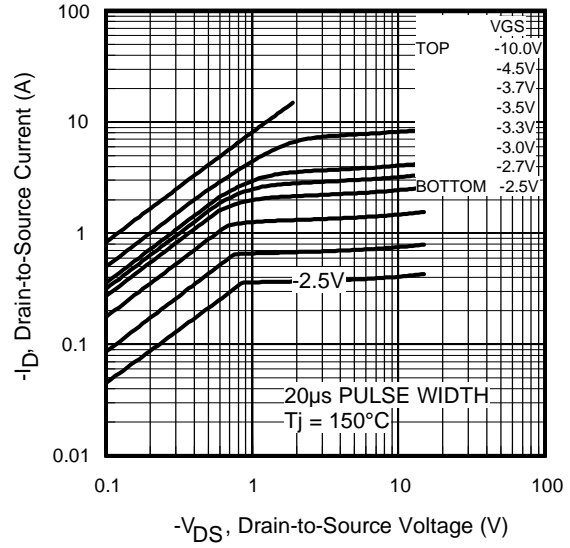


Fig 2. Typical Output Characteristics

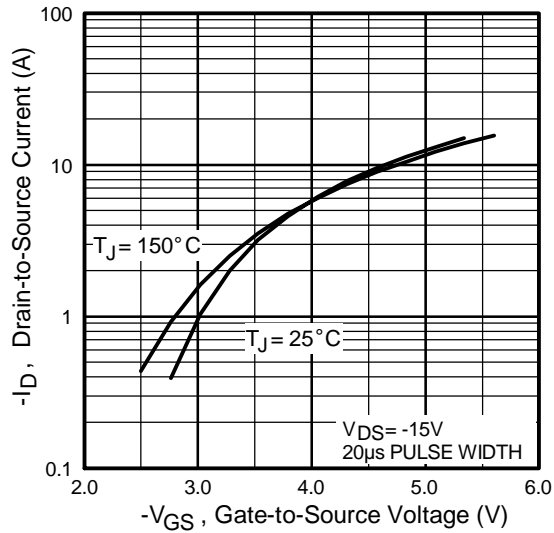


Fig 3. Typical Transfer Characteristics

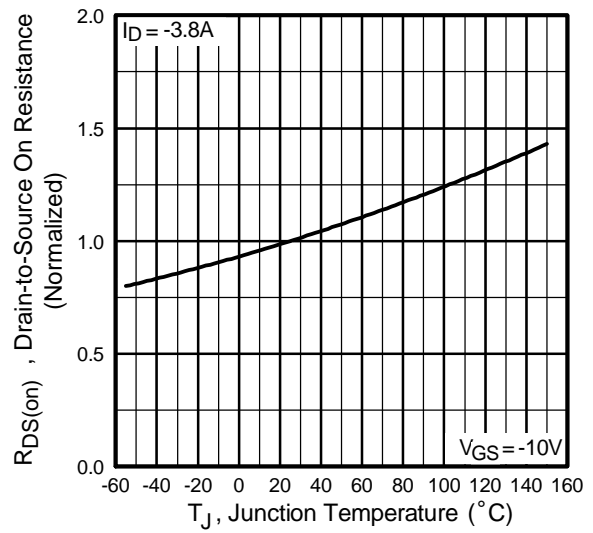


Fig 4. Normalized On-Resistance Vs. Temperature

IRF5805PbF

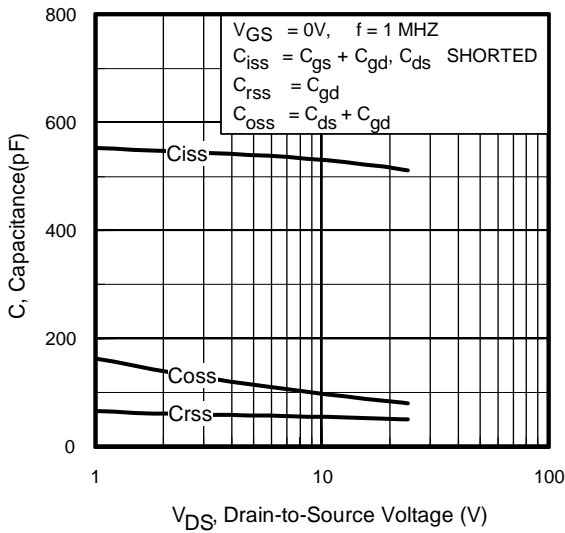


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

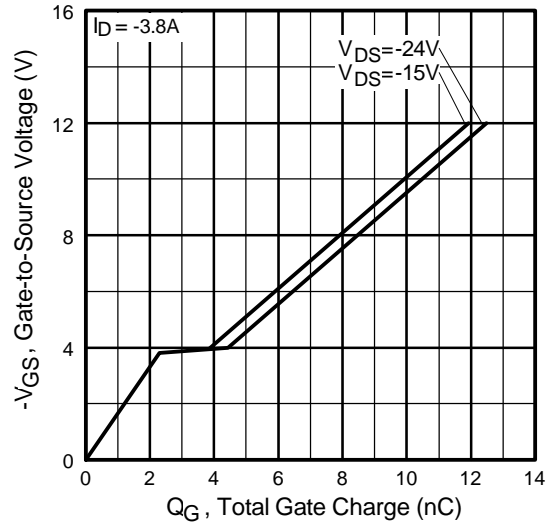


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

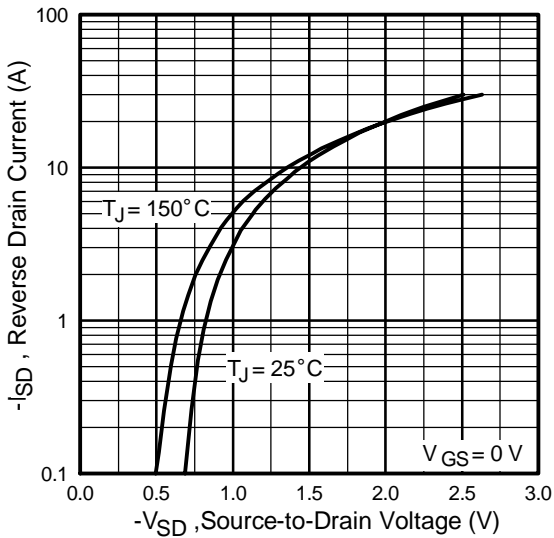


Fig 7. Typical Source-Drain Diode Forward Voltage

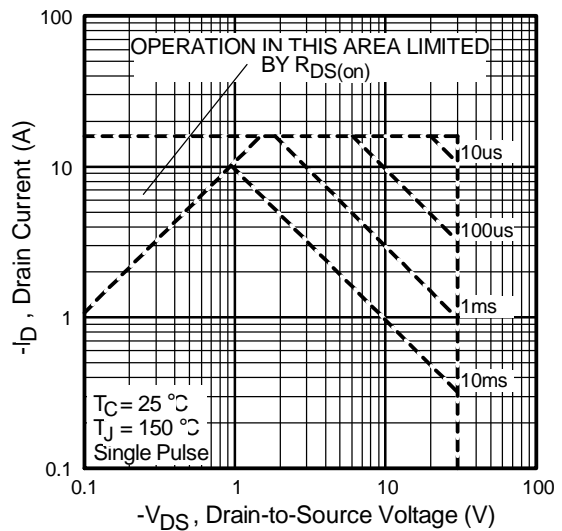


Fig 8. Maximum Safe Operating Area

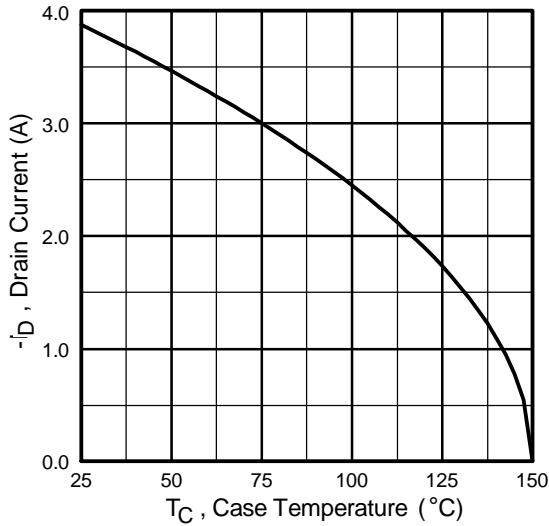


Fig 9. Maximum Drain Current Vs. Case Temperature

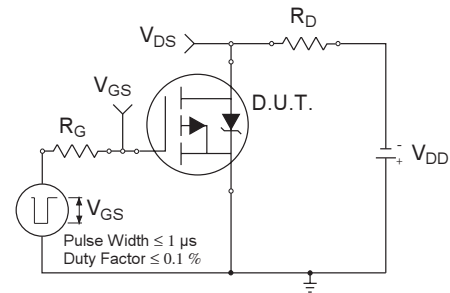


Fig 10a. Switching Time Test Circuit

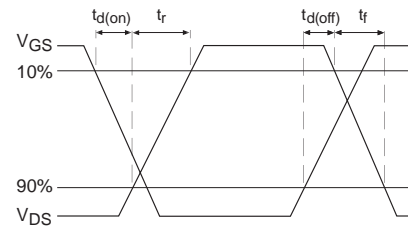


Fig 10b. Switching Time Waveforms

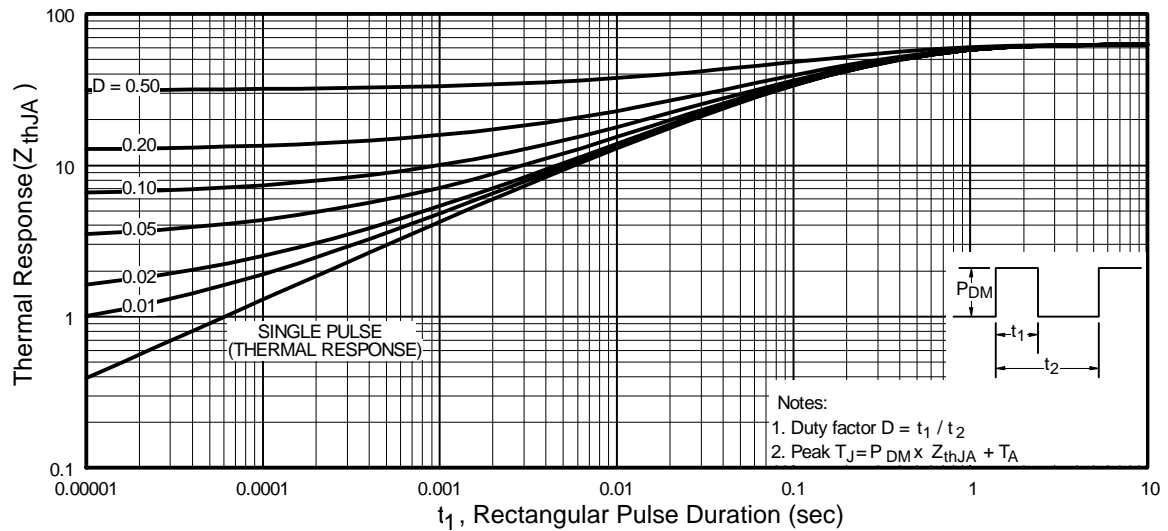


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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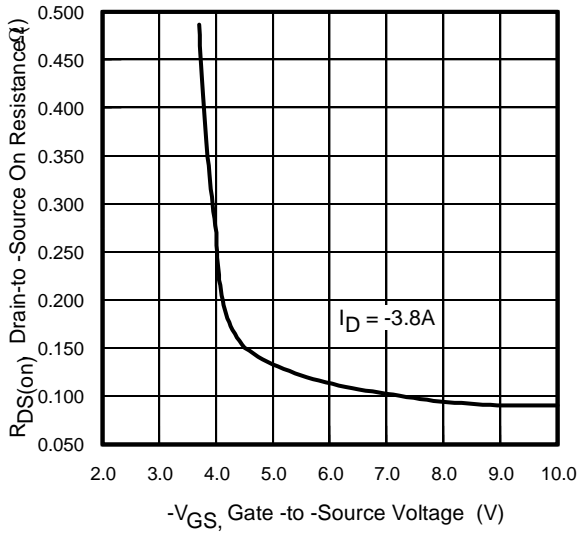


Fig 12. Typical On-Resistance Vs. Gate Voltage

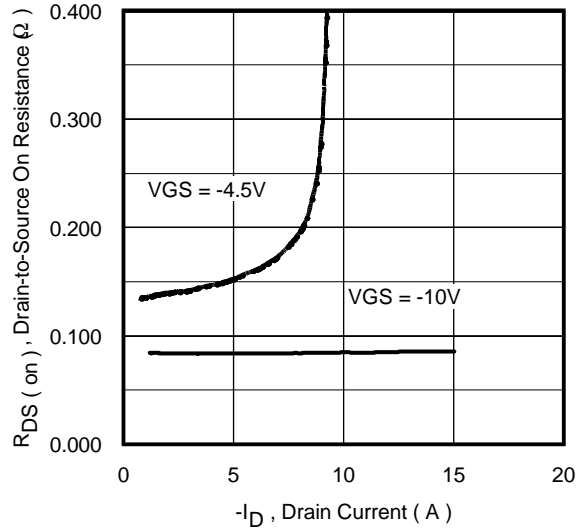


Fig 13. Typical On-Resistance Vs. Drain Current

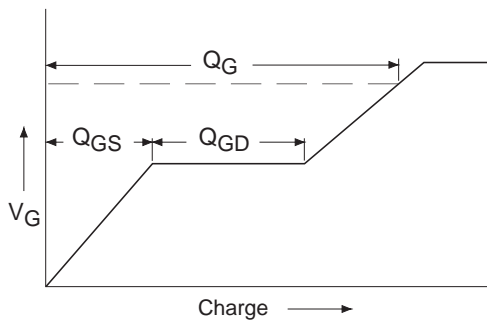


Fig 14a. Basic Gate Charge Waveform

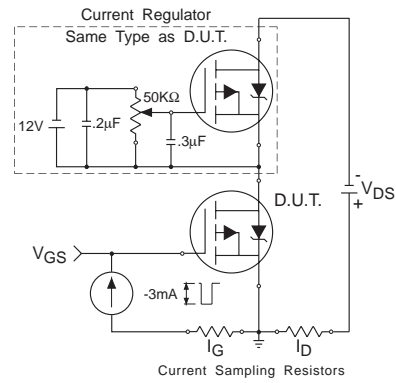


Fig 14b. Gate Charge Test Circuit

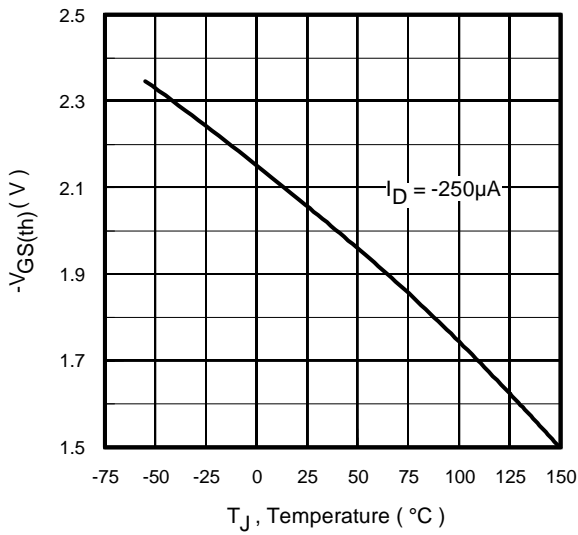


Fig 15. Typical $V_{GS(th)}$ Vs. Junction Temperature

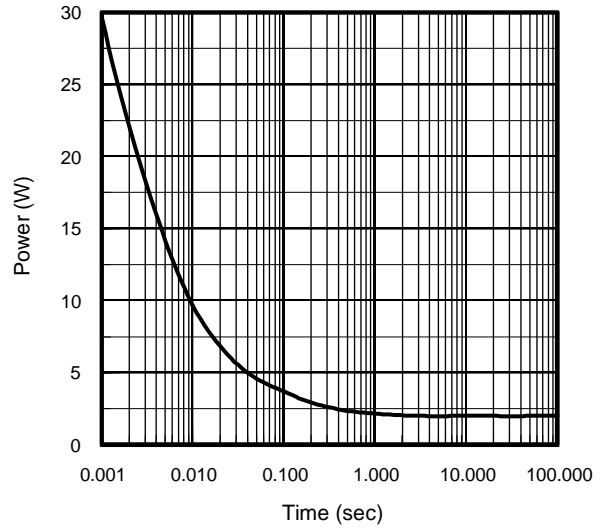
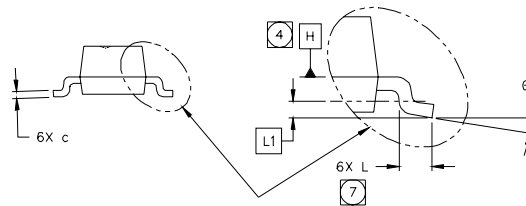
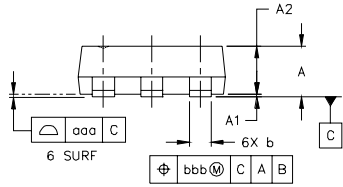
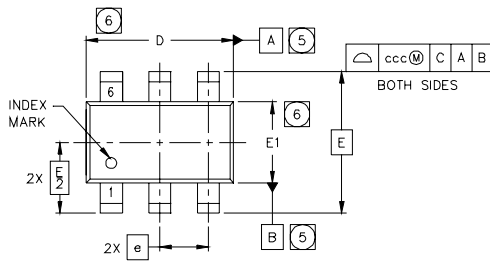


Fig 16. Typical Power Vs. Time

IRF5805PbF

TSOP-6 Package Outline

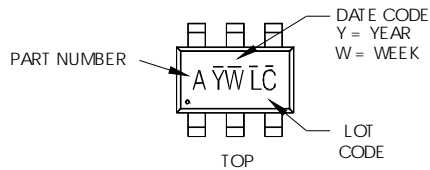
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SYMBOL	MO-193AA DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.10	---	---	.0433
A1	0.01	---	0.10	.0004	---	.0039
A2	0.80	0.90	1.00	.0315	.0354	.0393
b	0.25	---	0.50	.0099	---	.0196
c	0.10	---	0.26	.004	---	.010
D	2.90	3.00	3.10	.115	.118	.122
E	2.75 BSC			.108 BSC		
E1	1.30	1.50	1.70	.052	.059	.066
e	1.00 BSC			.039 BSC		
L	0.20	0.40	0.60	.0079	.0157	.0236
L1	0.30 BSC			.0118 BSC		
θ	0°	---	8°	0°	---	8°
aaa	0.10			.004		
bbb	0.15			.006		
ccc	0.25			.010		

TSOP-6 Part Marking Information

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



PART NUMBER CODE REFERENCE:

- A = SI3443DV
- B = IRF5800
- C = IRF5850
- D = IRF5851
- E = IRF5852
- F = IRF5801
- I = IRF5805
- J = IRF5806
- K = IRF5810
- L = IRF5804
- M = IRF5803
- N = IRF5802

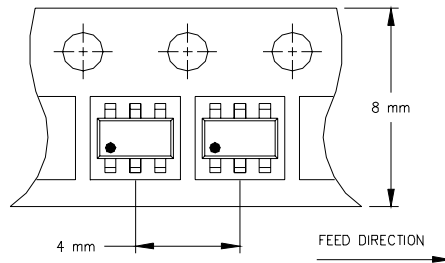
Note: A line above the work week (as shown here) indicates Lead-Free.

YEAR	Y	WORK WEEK	W
2001	1	01	A
2002	2	02	B
2003	3	03	C
2004	4	04	D
2005	5		
2006	6		
2007	7		
2008	8		
2009	9		
2010	0	24	X
		25	Y
		26	Z

W = (27-52) IF PRECEDED BY A LETTER

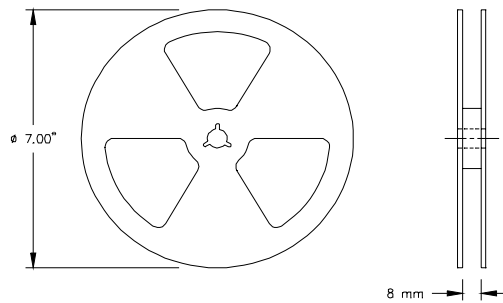
YEAR	Y	WORK WEEK	W
2001	A	27	A
2002	B	28	B
2003	C	29	C
2004	D	30	D
2005	E		
2006	F		
2007	G		
2008	H		
2009	J		
2010	K	50	X
		51	Y
		52	Z

TSOP-6 Tape & Reel Information



NOTES:

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



NOTES:

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

Data and specifications subject to change without notice.
This product has been designed and qualified for the Consumer market.
Qualifications 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

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