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International
IOR Rectifier

IRF5802

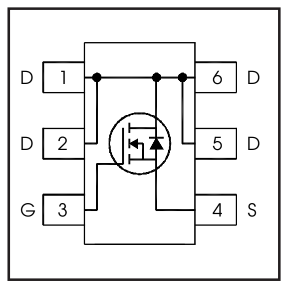
SMPS MOSFET

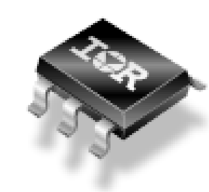
HEXFET® Power MOSFET

V_{DSS}	$R_{DS(on)}$ max	I_D
150V	1.2Ω@V_{GS} = 10V	0.9A

Applications
- High frequency DC-DC converters

Benefits
- Low Gate to Drain Charge to Reduce Switching Losses
- Fully Characterized Capacitance Including Effective C_{OSS} to Simplify Design, (See App. Note AN1001)
- Fully Characterized Avalanche Voltage and Current





TSOP-6

Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	0.9	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	0.7	
I_{DM}	Pulsed Drain Current ①	7.0	
P_D @T_A = 25°C	Power Dissipation④	2.0	W
	Linear Derating Factor	0.02	W/°C
V_{GS}	Gate-to-Source Voltage	± 30	V
dv/dt	Peak Diode Recovery dv/dt ⑥	7.1	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	

Thermal Resistance

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient④	62.5	°C/W

Notes ① through ⑥ are on page 8

1/23/01

Static @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	150	——	——	V	V_{GS} = 0V, I_D = 250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	0.19	——	V/°C	Reference to 25°C, I_D = 1mA ③
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	——	1.2	Ω	V_{GS} = 10V, I_D = 0.54A ③
$V_{GS(th)}$	Gate Threshold Voltage	3.0	——	5.5	V	V_{DS} = V_{GS}, I_D = 250μA
I_{DSS}	Drain-to-Source Leakage Current	——	——	25	μA	V_{DS} = 150V, V_{GS} = 0V
		——	——	250		V_{DS} = 120V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	——	——	100	nA	V_{GS} = 30V
	Gate-to-Source Reverse Leakage	——	——	-100		V_{GS} = -30V

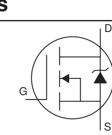
Dynamic @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
g_{fs}	Forward Transconductance	0.55	——	——	S	V_{DS} = 50V, I_D = 0.54A
Q_g	Total Gate Charge	——	4.5	6.8	nC	I_D = 0.54A
Q_{gs}	Gate-to-Source Charge	——	1.0	1.5		V_{DS} = 120V
Q_{gd}	Gate-to-Drain ("Miller") Charge	——	2.4	3.6		V_{GS} = 10V,
$t_{d(on)}$	Turn-On Delay Time	——	6.0	——	ns	V_{DD} = 75V
t_r	Rise Time	——	1.6	——		I_D = 0.54A
$t_{d(off)}$	Turn-Off Delay Time	——	7.5	——		R_G = 6.0Ω
t_f	Fall Time	——	9.2	——		V_{GS} = 10V ③
C_{iss}	Input Capacitance	——	88	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	26	——		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	——	7.7	——		ƒ = 1.0MHz
C_{oss}	Output Capacitance	——	110	——		V_{GS} = 0V, V_{DS} = 1.0V, ƒ = 1.0MHz
C_{oss}	Output Capacitance	——	14	——		V_{GS} = 0V, V_{DS} = 120V, ƒ = 1.0MHz
C_{oss} eff.	Effective Output Capacitance	——	3.0	——		V_{GS} = 0V, V_{DS} = 0V to 120V ⑤

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy②	——	9.5	mJ
I_{AR}	Avalanche Current①	——	0.9	A

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	——	——	1.8	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	——	——	1.3	V	T_J = 25°C, I_S = 0.54A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	——	46	69	ns	T_J = 25°C, I_F = 0.54A
Q_{rr}	Reverse RecoveryCharge	——	55	83	nC	di/dt = 100A/μs ③

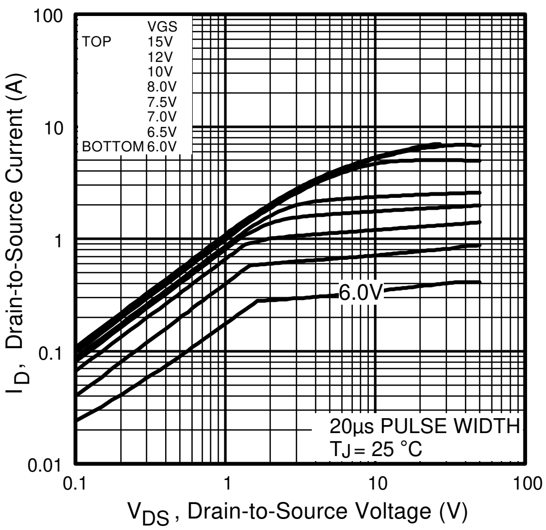


Fig 1. Typical Output Characteristics

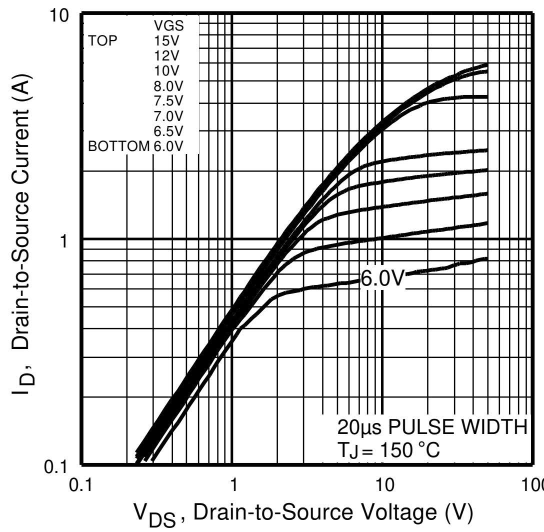


Fig 2. Typical Output Characteristics

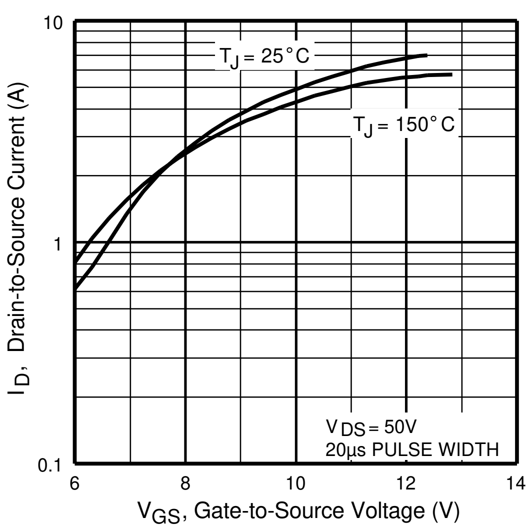


Fig 3. Typical Transfer Characteristics

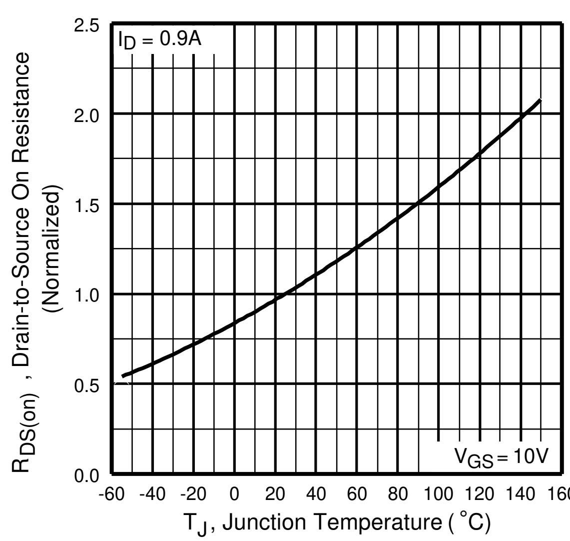


Fig 4. Normalized On-Resistance Vs. Temperature

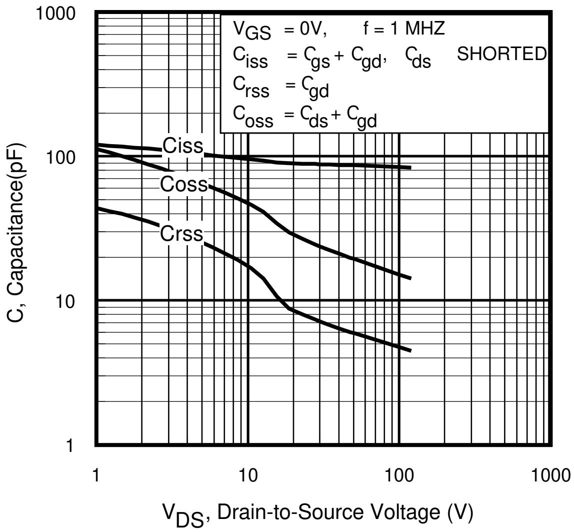


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

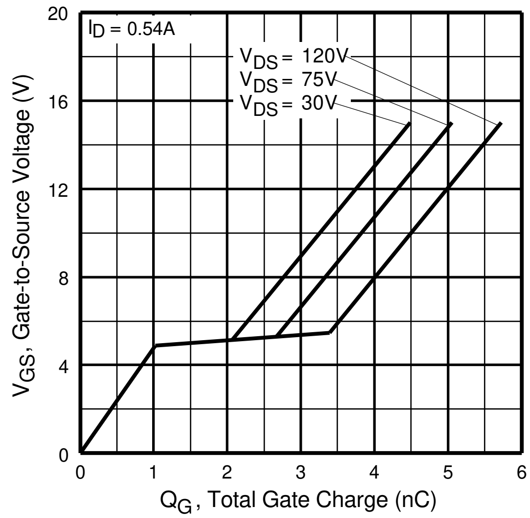


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

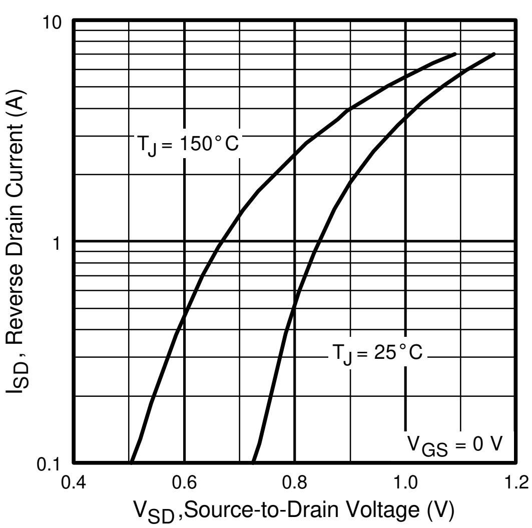


Fig 7. Typical Source-Drain Diode Forward Voltage

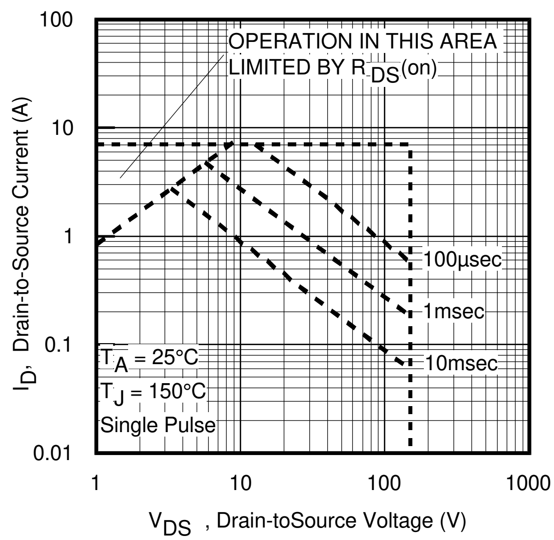


Fig 8. Maximum Safe Operating Area

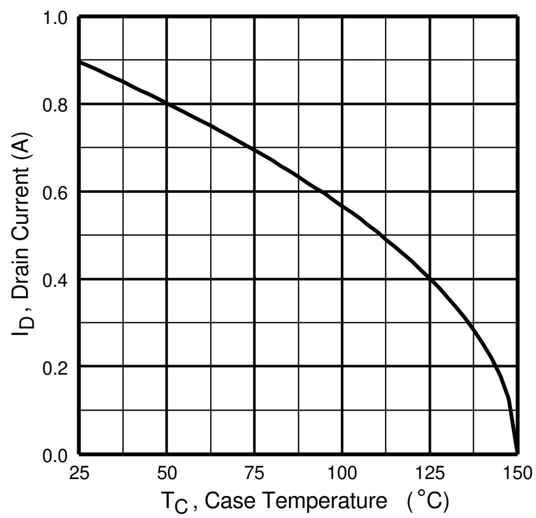


Fig 9. Maximum Drain Current Vs. Case Temperature

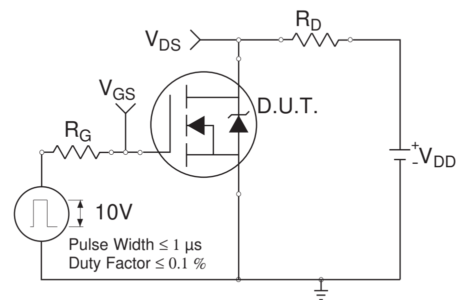


Fig 10a. Switching Time Test Circuit

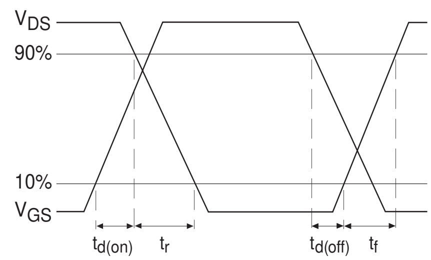


Fig 10b. Switching Time Waveforms

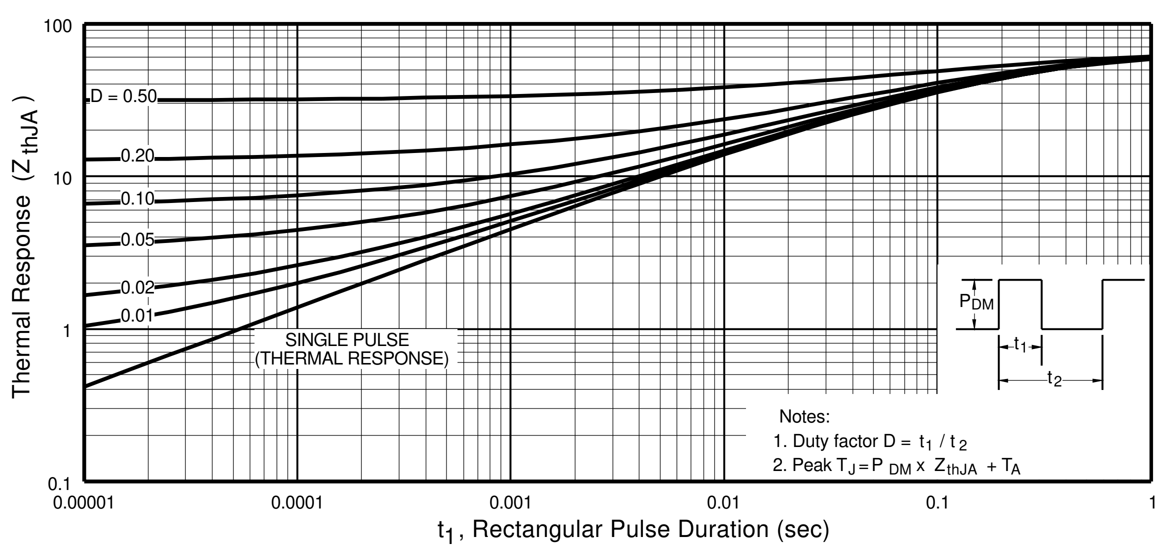


Fig 11. Typical Effective Transient Thermal Impedance, Junction-to-Ambient

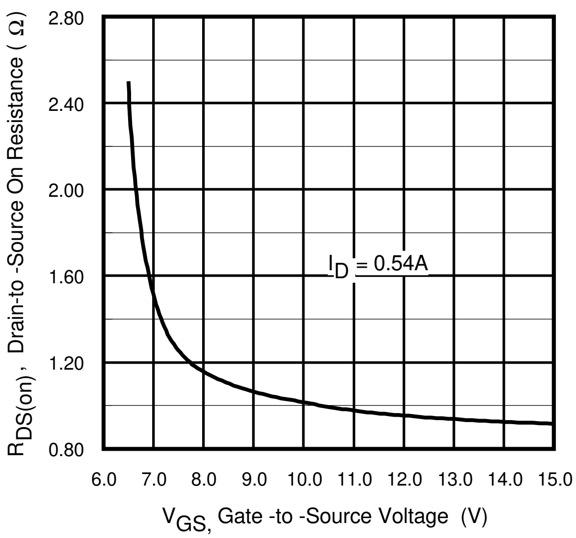


Fig 12. Typical On-Resistance Vs. Gate Voltage

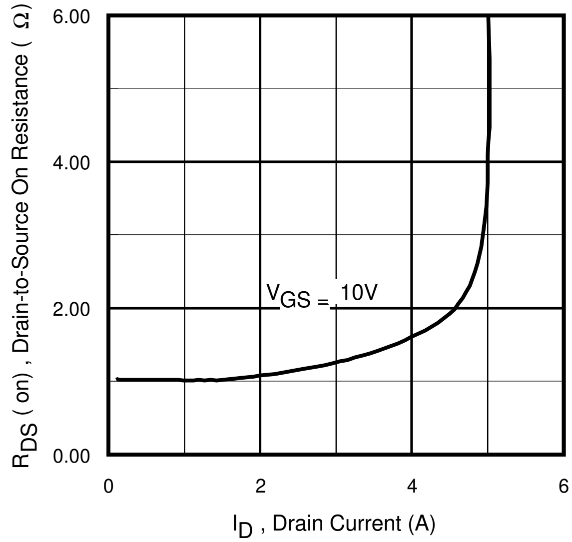


Fig 13. Typical On-Resistance Vs. Drain Current

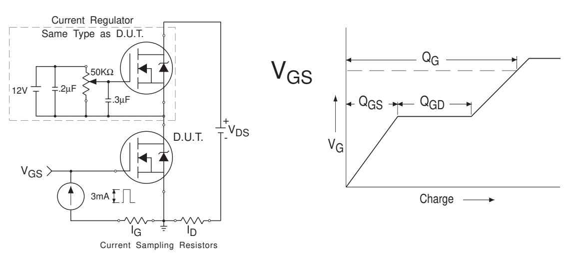
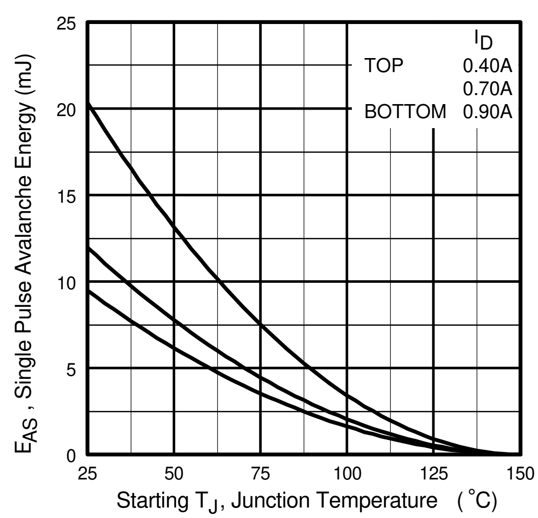


Fig 14a&b. Basic Gate Charge Test Circuit and Waveform



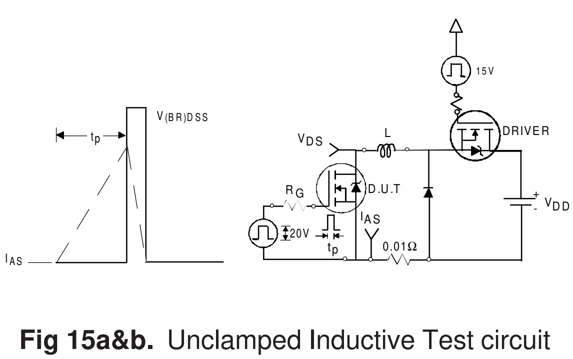
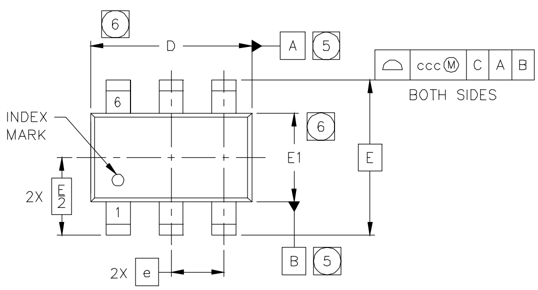


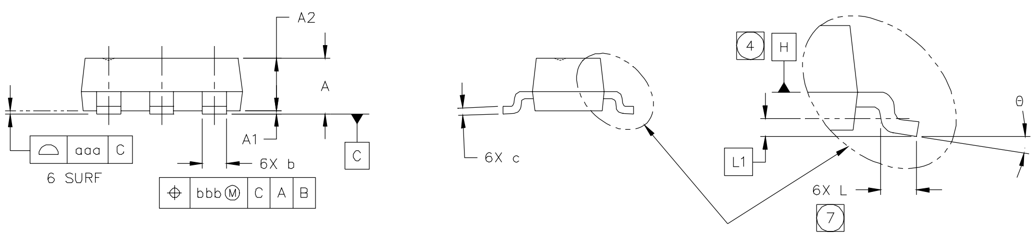
Fig 15a&b. Unclamped Inductive Test circuit and Waveforms

Fig 15c. Maximum Avalanche Energy Vs. Drain Current

TSOP-6 Package Outline

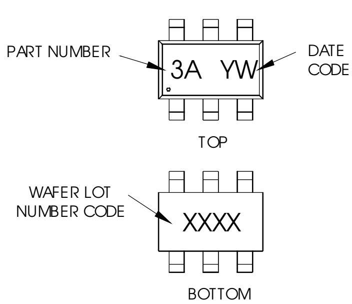


SYMBOL	MO-193AA DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.10	---	---	.0433
A1	0.01	---	0.10	.0004	---	.0039
A2	0.80	0.90	1.00	.0315	.0354	.0393
b	0.25	---	0.50	.0099	---	.0196
c	0.10	---	0.26	.004	---	.010
D	2.90	3.00	3.10	.115	.118	.122
E	2.75 BSC			.108 BSC		
E1	1.30	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

EXAMPLE: THIS IS AN SI3443DV



WW = (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		
1996	6	↓	↓
1997	7		
1998	8		
1999	9		
2000	0	24	X
		25	Y
		26	Z

PART NUMBER CODE REFERENCE:

3A = SI3443DV
3B = IRF5800
3C = IRF5850
3D = IRF5851
3E = IRF5852
3I = IRF5805
3J = IRF5806

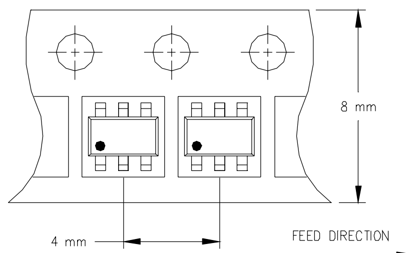
DATE CODE EXAMPLES:

YWW = 9603 = 6C
YWW = 9632 = FF

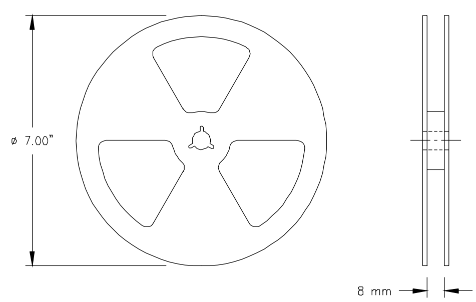
WW = (27-52) IF PRECEDED BY A LETTER

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		
2000	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.

Notes:

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

② Starting $T_J = 25°C$, $L = 23mH$ $R_G = 25\Omega$, $I_{AS} = 0.54A$.

③ Pulse width ≤ 400µs; duty cycle ≤ 2%.

④ When mounted on 1 inch square copper board

⑤ C_{oss} eff. is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS}

⑥ $I_{SD} \leq 0.54A$, $di/dt \leq 89A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150°C$

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

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