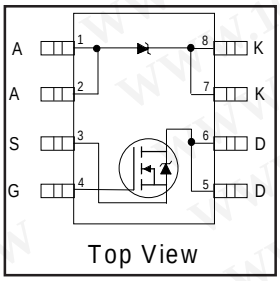
International
IOR Rectifier

PD- 93809

IRF7353D2

FETKY™ MOSFET / Schottky Diode

- Co-Pack HEXFET® Power MOSFET and Schottky Diode
- Ideal For Buck Regulator Applications
- N-Channel HEXFET power MOSFET
- Low V_F Schottky Rectifier
- Generation 5 Technology
- SO-8 Footprint



Top View

V_{DSS} = 30V

$R_{DS(on)}$ = 0.029Ω

Schottky V_F = 0.52V


SO-8

Description

The **FETKY**™ family of Co-Pack HEXFET® Power MOSFETs and Schottky diodes offers the designer an innovative, board space saving solution for switching regulator and power management applications. Generation 5 HEXFET power MOSFETs utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. Combinining this technology with International Rectifier's low forward drop Schottky rectifiers results in an extremely efficient device suitable for use in a wide variety of portable electronics applications.

The SO-8 has been modified through a customized leadframe for enhanced thermal characteristics. The SO-8 package is designed for vapor phase, infrared or wave soldering techniques.

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Parameter		Maximum	Units
I_D @ T_A = 25°C	Continuous Drain Current ④	6.5	A
I_D @ T_A = 70°C		5.2	
I_{DM}	Pulsed Drain Current ①	52	
P_D @T_A = 25°C	Power Dissipation ④	2.0	W
P_D @T_A = 70°C		1.3	
	Linear Derating Factor	16	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		Maximum	Units
$R_{\theta JA}$	Junction-to-Ambient ⑤	62.5	°C/W

Notes:

① Repetitive rating; pulse width limited by maximum junction temperature (see figure 9)

② Starting T_J = 25°C, L = 10mH, R_G = 25Ω, I_{AS} = 4.0A

③ I_{SD} ≤ 4.0A, di/dt ≤ 74A/µs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C

④ Pulse width ≤ 300µs; duty cycle ≤ 2%

⑤ Surface mounted on FR-4 board, t ≤ 10sec.

MOSFET 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
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.023	0.029	Ω	V_{GS} = 10V, I_D = 5.8A ④
		—	0.032	0.046		V_{GS} = 4.5V, I_D = 4.7A ④
$V_{GS(th)}$	Gate Threshold Voltage	1.0	—	—	V	V_{DS} = V_{GS}, I_D = 250µA
g_{fs}	Forward Transconductance	—	14	—	S	V_{DS} = 24V, I_D = 5.8A
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 = 55°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	—	22	33	nC	I_D = 5.8A
Q_{gs}	Gate-to-Source Charge	—	2.6	3.9		V_{DS} = 24V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	6.4	9.6		V_{GS} = 10V (see figure 8) ④
$t_{d(on)}$	Turn-On Delay Time	—	8.1	12	ns	V_{DD} = -5V
t_r	Rise Time	—	8.9	13		I_D = 1.0A
$t_{d(off)}$	Turn-Off Delay Time	—	26	39		R_G = 6.0Ω
t_f	Fall Time	—	18	26		R_D = 15Ω ④
C_{iss}	Input Capacitance	—	650	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	320	—		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	—	130	—		f = 1.0MHz (see figure 7)

MOSFET Source-Drain Ratings and Characteristics

Parameter		Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	2.5	A	
I_{SM}	Pulsed Source Current (Body Diode)	—	—	30		
V_{SD}	Body Diode Forward Voltage	—	0.78	1.0	V	T_J = 25°C, I_S = 1.7A, V_{GS} = 0V
t_{rr}	Reverse Recovery Time (Body Diode)	—	45	68	ns	T_J = 25°C, I_F = 1.7A
Q_{rr}	Reverse Recovery Charge	—	58	87	nC	di/dt = 100A/µs ③

Schottky Diode Maximum Ratings

	Parameter	Max.	Units	Conditions	
$I_{F\ (av)}$	Max. Average Forward Current	3.2	A	50% Duty Cycle. Rectangular Wave, Tc = 25°C	
		2.0		50% Duty Cycle. Rectangular Wave, Tc = 70°C	
I_{SM}	Max. peak one cycle Non-repetitive Surge current	200	A	5µs sine or 3µs Rect. pulse	Following any rated load condition & with Vrrm applied
		20		10ms sine or 6ms Rect. pulse	

Schottky Diode Electrical Specifications

	Parameter	Max.	Units	Conditions	
V_{FM}	Max. Forward voltage drop	0.57	V	If = 3.0, Tj = 25°C	
		0.77		If = 6.0, Tj = 25°C	
		0.52		If = 3.0, Tj = 125°C	
		0.79		If = 6.0, Tj = 125°C .	
I_{rm}	Max. Reverse Leakage current	0.30	mA	Vr = 30V	Tj = 25°C
		37			Tj = 125°C
C_t	Max. Junction Capacitance	310	pF	Vr = 5Vdc (100kHz to 1 MHz) 25°C	
dv/dt	Max. Voltage Rate of Charge	4900	V/µs	Rated Vr	

(HEXFET is the reg. TM for International Rectifier Power MOSFET's)

Power MOSFET Characteristics

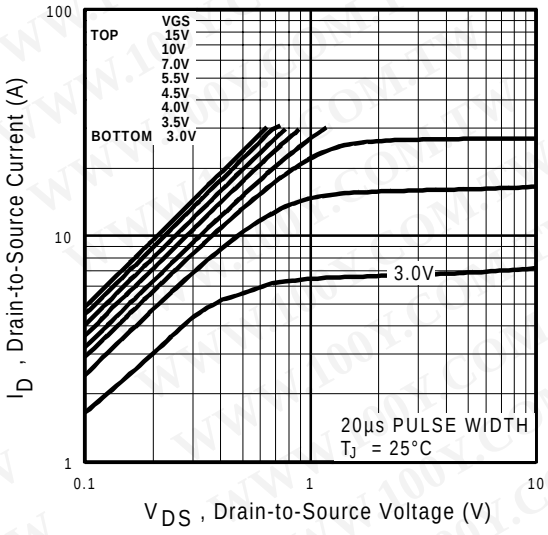


Fig 1. Typical Output Characteristics

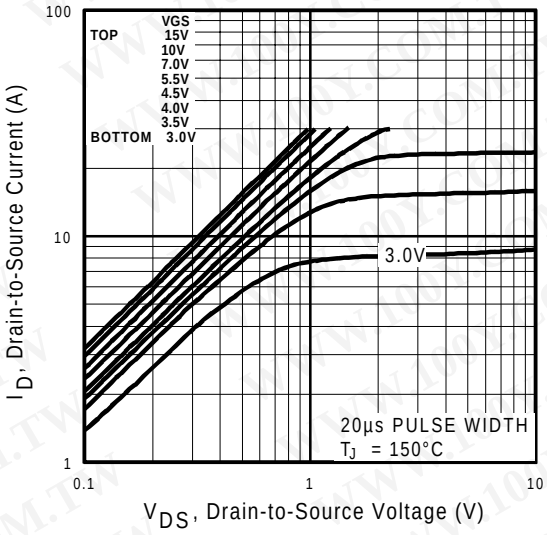


Fig 2. Typical Output Characteristics

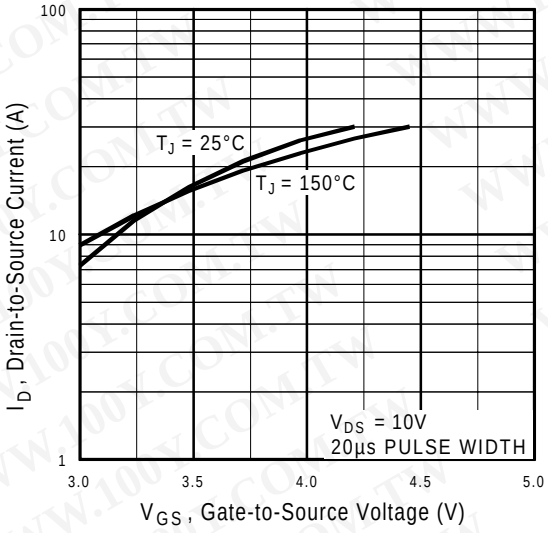


Fig 3. Typical Transfer Characteristics

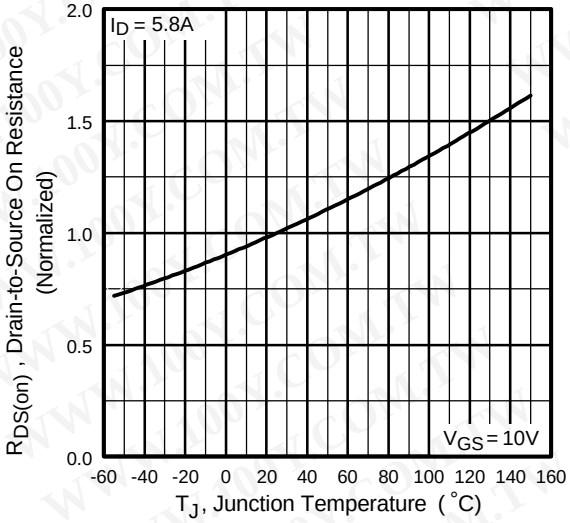


Fig 4. Normalized On-Resistance Vs. Temperature

Power MOSFET Characteristics

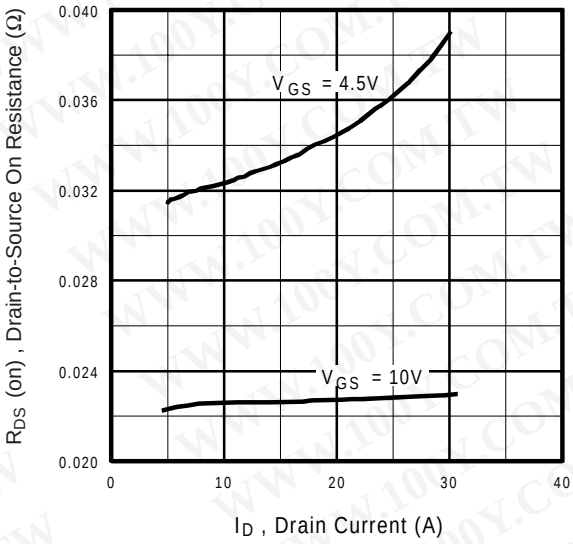


Fig 5. Typical On-Resistance Vs. Drain Current

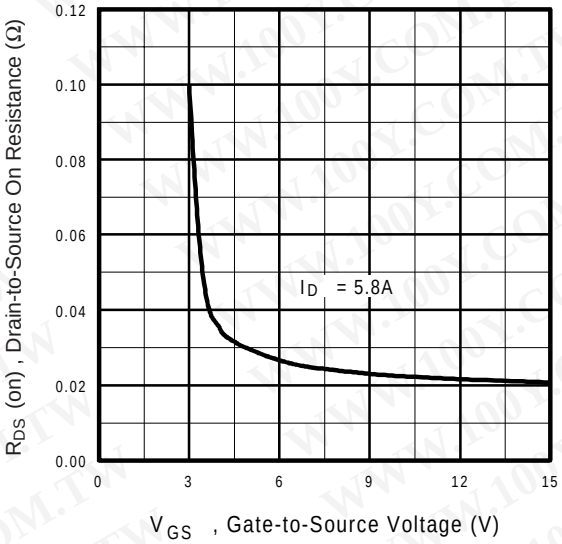


Fig 6. Typical On-Resistance Vs. Gate Voltage

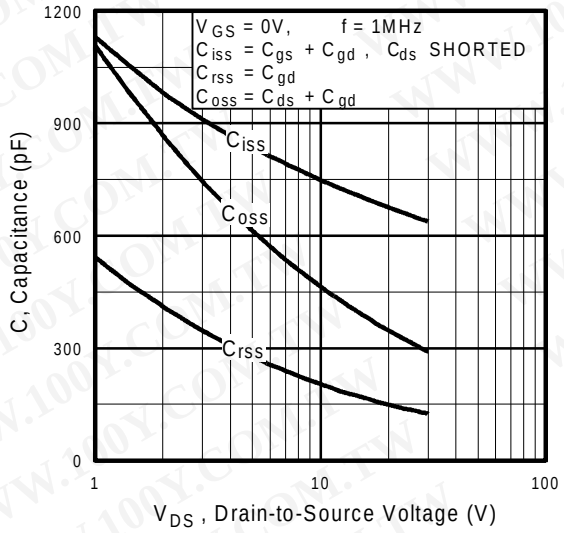


Fig 7. Typical Capacitance Vs. Drain-to-Source Voltage

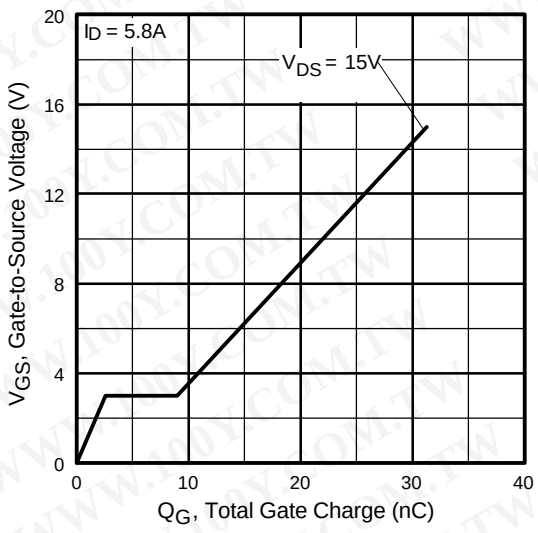


Fig 8. Typical Gate Charge Vs. Gate-to-Source Voltage

Power MOSFET Characteristics

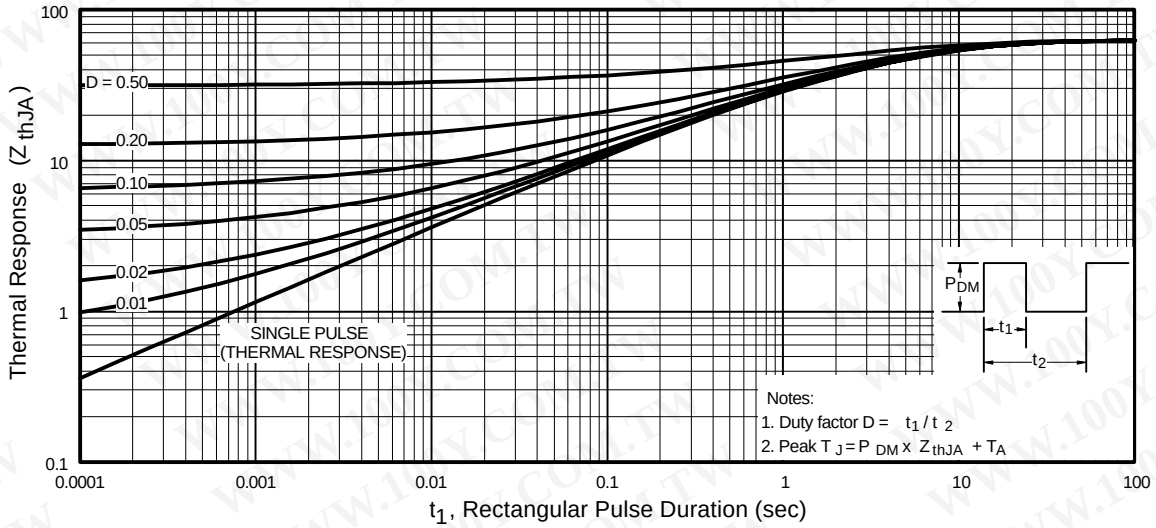


Fig 9. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

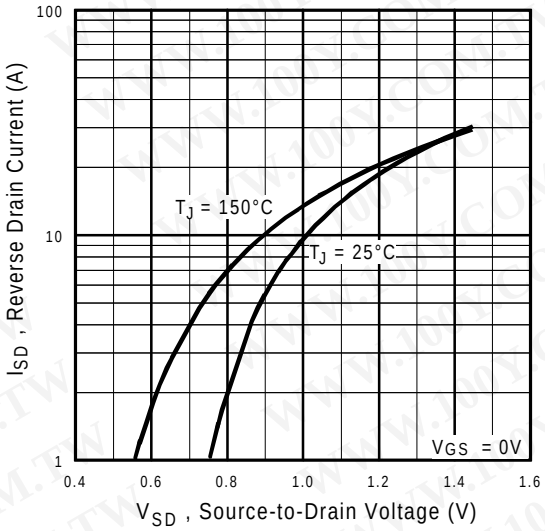


Fig 10. Typical Source-Drain Diode Forward Voltage

Schottky Diode Characteristics

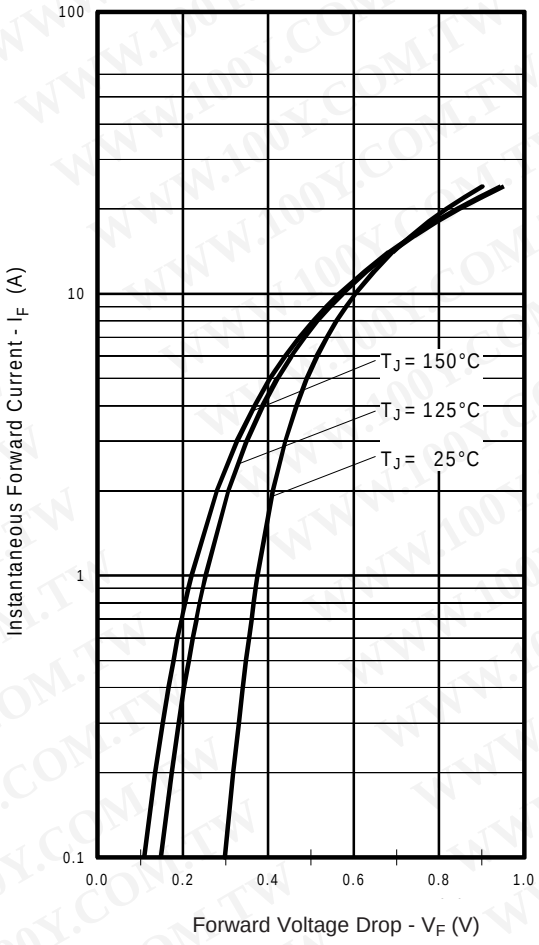


Fig. 12 - Typical Forward Voltage Drop Characteristics

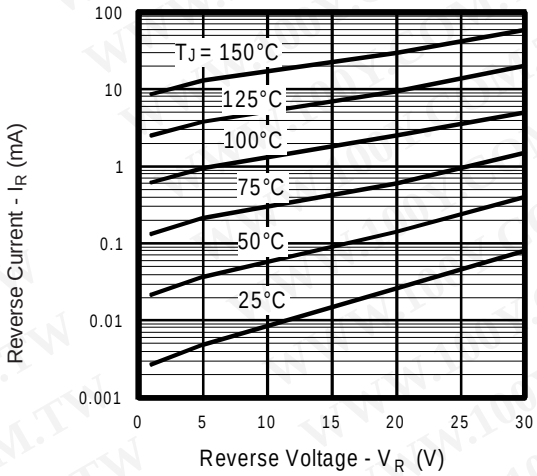


Fig. 13 - Typical Values of Reverse Current Vs. Reverse Voltage

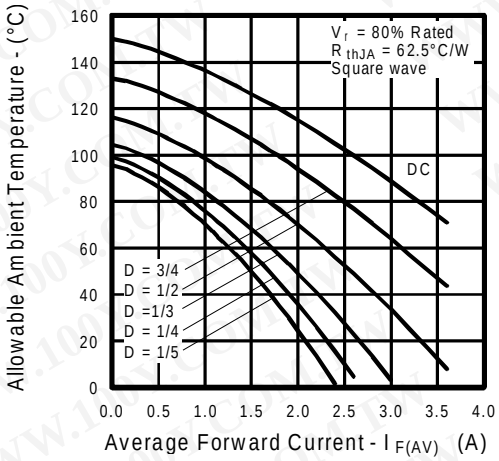
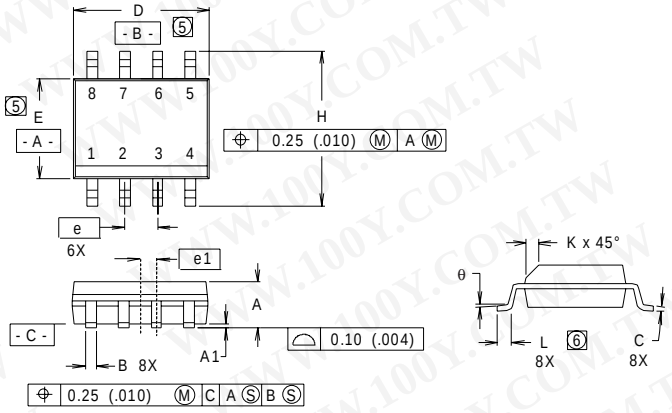


Fig.14 - Maximum Allowable Ambient Temp. Vs. Forward Current

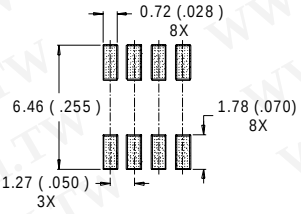
SO-8 Package Details



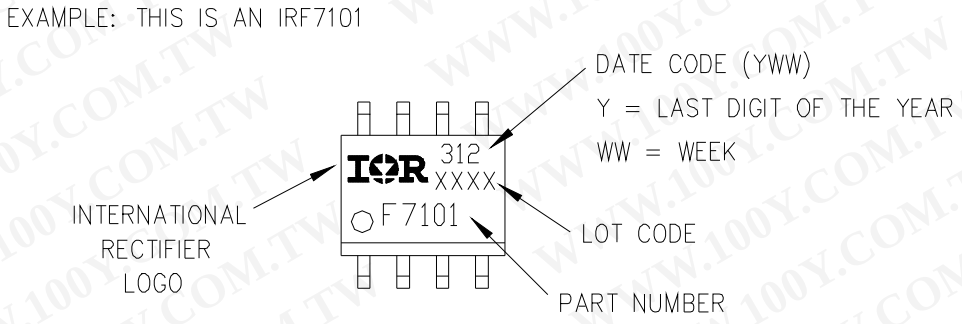
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
B	.014	.018	0.36	0.46
C	.0075	.0098	0.19	0.25
D	.189	.196	4.80	4.98
E	.150	.157	3.81	3.99
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.011	.019	0.28	0.48
L	0.16	.050	0.41	1.27
θ	0°	8°	0°	8°

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION : INCH.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS
   MOLD PROTRUSIONS NOT TO EXCEED 0.25 (.006).
6. DIMENSIONS IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE..

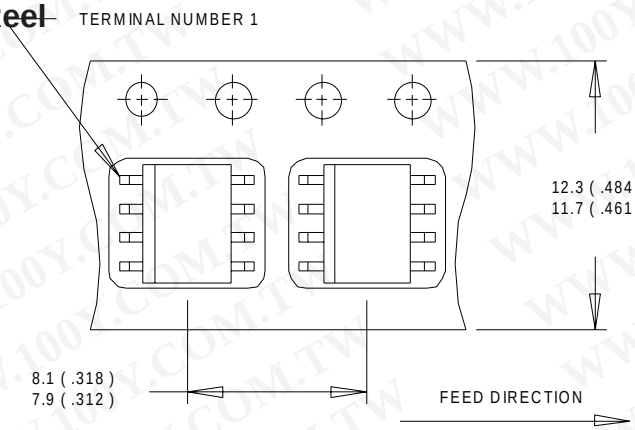
RECOMMENDED FOOTPRINT



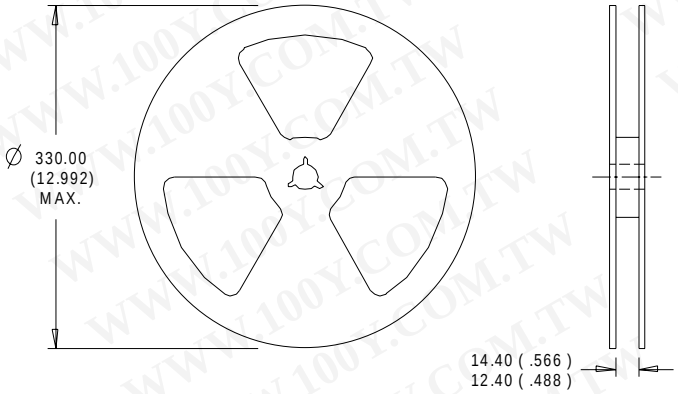
SO-8 Part Marking



SO-8 Tape and Reel



NOTES:
1. CONTROLLING DIMENSION : MILLIMETER.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS(INCHES).
3. OUTLINE CONFORMS TO EIA-481 & EIA-541.



NOTES :
1. CONTROLLING DIMENSION : MILLIMETER.
2. OUTLINE CONFORMS TO EIA-481 & EIA-541.

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Data and specifications subject to change without notice. *11/99*