International
IOR Rectifier

PD-96022

IRF7705PbF

HEXFET® Power MOSFET

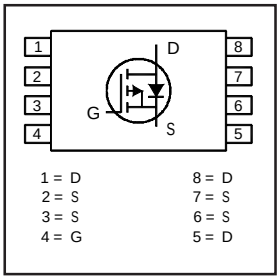
- Ultra Low On-Resistance
- P-Channel MOSFET
- Very Small SOIC Package
- Low Profile (< 1.2mm)
- Available in Tape & Reel
- Lead-Free

V_{DSS}	$R_{DS(on)}$ max (mΩ)	I_D
-30V	18 @V_{GS} = -10V	-8.0A
	30 @V_{GS} = -4.5V	-6.0A

Description

HEXFET® power MOSFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the ruggedized device design, that International Rectifier is well known for, provides the designer with an extremely efficient and reliable device for use in battery and load management.

The TSSOP-8 package has 45% less footprint area than the standard SO-8. This makes the TSSOP-8 an ideal device for applications where printed circuit board space is at a premium. The low profile (<1.2mm) allows it to fit easily into extremely thin environments such as portable electronics and PCMCIA cards.



Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain- Source Voltage	-30	V
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ -10V	-8.0	A
I_D @ T_C = 70°C	Continuous Drain Current, V_{GS} @ -10V	-6.0	
I_{DM}	Pulsed Drain Current ①	-30	
P_D @T_C = 25°C	Power Dissipation ③	1.5	W
P_D @T_C = 70°C	Power Dissipation ③	0.96	
	Linear Derating Factor	0.012	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient③	83	°C/W

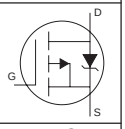
10/21/05

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
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.015	—	V/°C	Reference to 25°C, I_D = -1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	18	mΩ	V_{GS} = -10V, I_D = -8.0A ②
		—	—	30		V_{GS} = -4.5V, I_D = -6.0A ②
$V_{GS(th)}$	Gate Threshold Voltage	-1.0	—	-2.5	V	V_{DS} = V_{GS}, I_D = -250µA
g_{fs}	Forward Transconductance	13	—	—	S	V_{DS} = -10V, I_D = -8.0A
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	—	58	88	nC	I_D = -8.0A
Q_{gs}	Gate-to-Source Charge	—	10	—		V_{DS} = -15V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	9.0	—		V_{GS} = -10V②
$t_{d(on)}$	Turn-On Delay Time	—	18	27	ns	V_{DD} = -15V, V_{GS} = -10V②
t_r	Rise Time	—	35	53		I_D = -1.0A
$t_{d(off)}$	Turn-Off Delay Time	—	270	405		R_D = 15Ω
t_f	Fall Time	—	128	190		R_G = 6.0Ω ②
C_{iss}	Input Capacitance	—	2774	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	418	—		V_{DS} = -25V
C_{rss}	Reverse Transfer Capacitance	—	270	—		f = 1.0MHz

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-1.5	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	-30		
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	T_J = 25°C, I_S = -1.5A, V_{GS} = 0V ②
t_{rr}	Reverse Recovery Time	—	36	54	ns	T_J = 25°C, I_F = -1.5A
Q_{rr}	Reverse RecoveryCharge	—	34	50	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 When mounted on 1 inch square copper board, t<10 sec

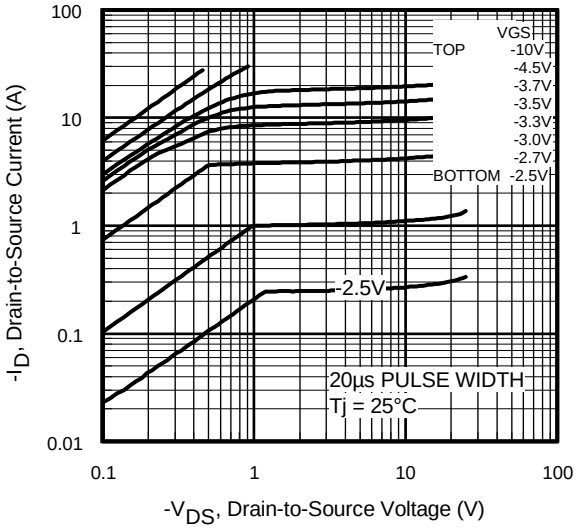


Fig 1. Typical Output Characteristics

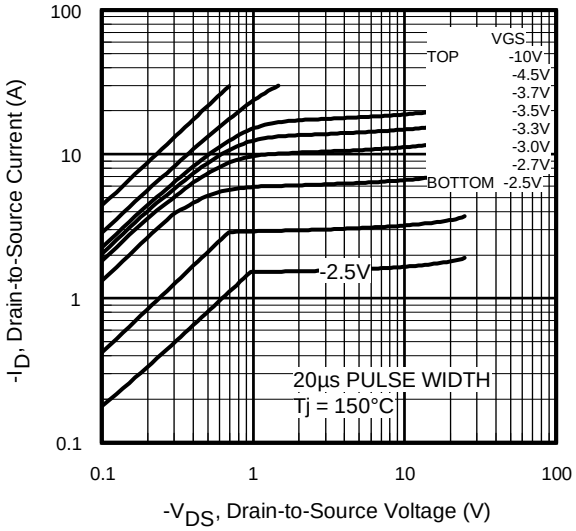


Fig 2. Typical Output Characteristics

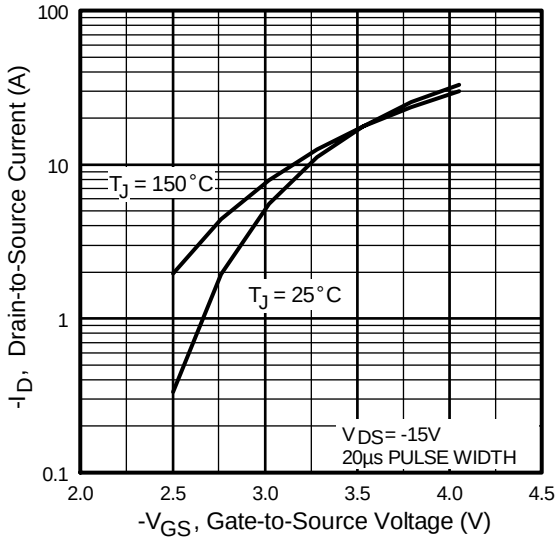


Fig 3. Typical Transfer Characteristics

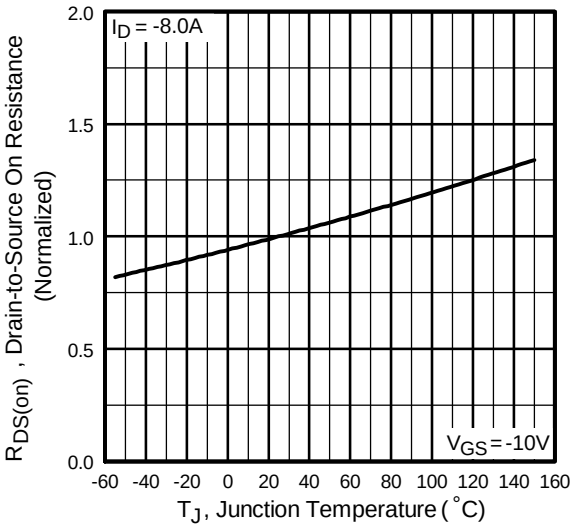


Fig 4. Normalized On-Resistance Vs. Temperature

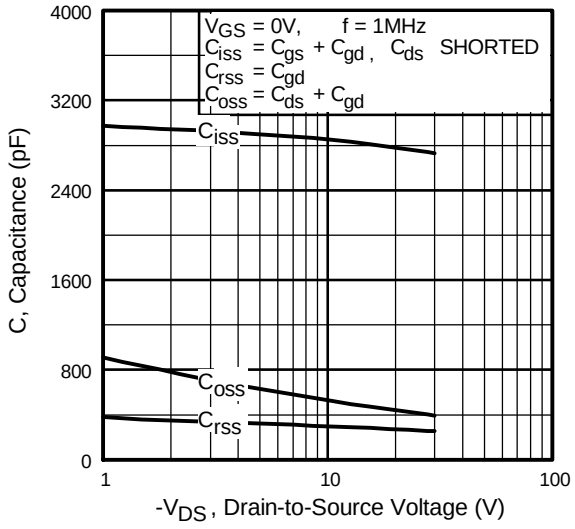


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

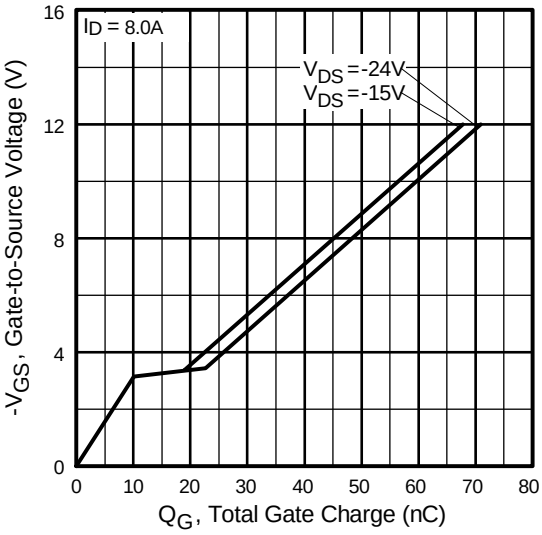


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

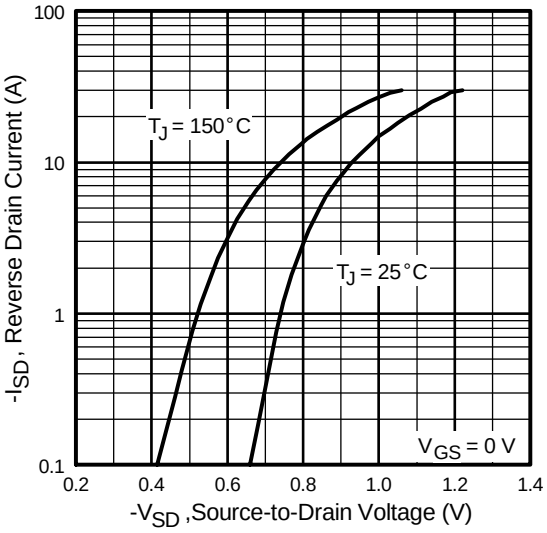


Fig 7. Typical Source-Drain Diode Forward Voltage

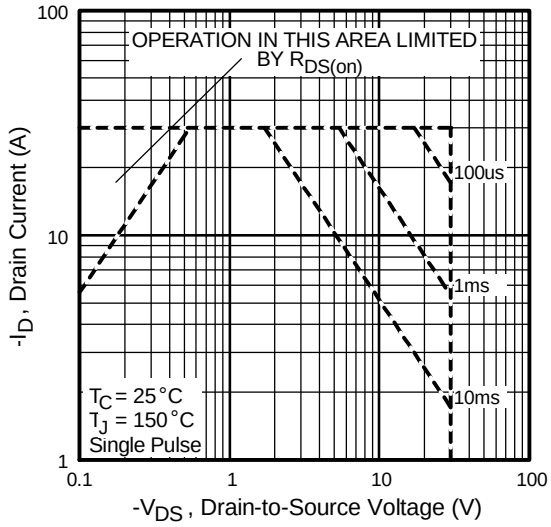


Fig 8. Maximum Safe Operating Area

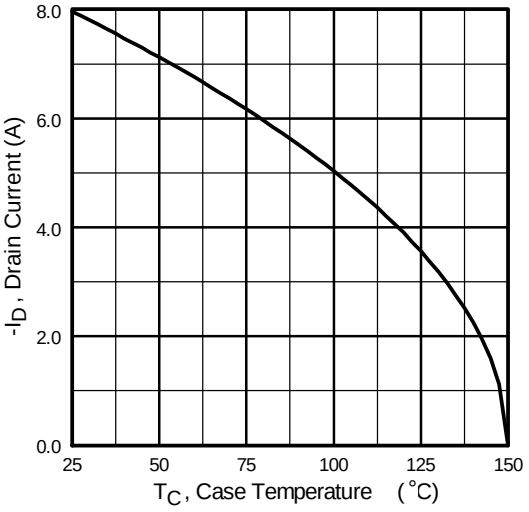


Fig 9. Maximum Drain Current Vs. Case Temperature

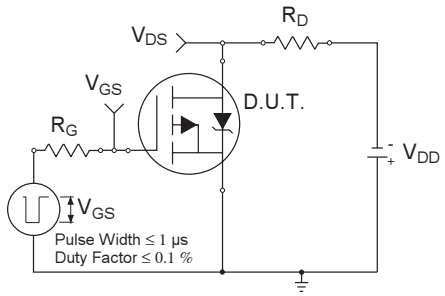


Fig 10a. Switching Time Test Circuit

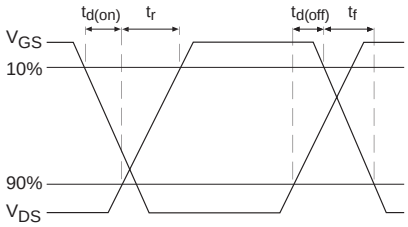


Fig 10b. Switching Time Waveforms

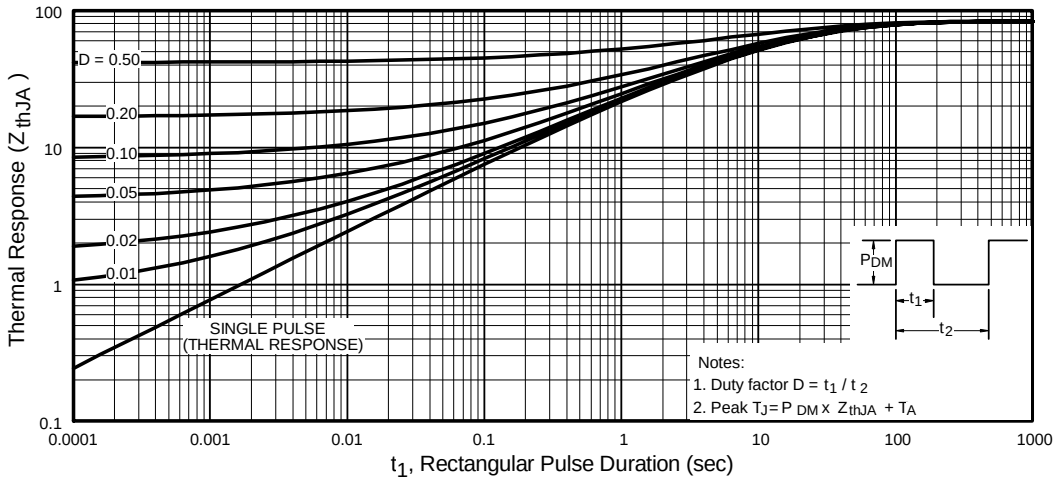


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

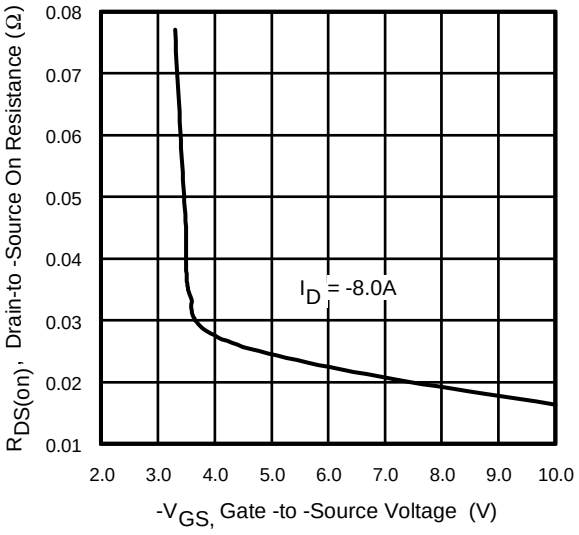


Fig 12. Typical On-Resistance Vs. Gate Voltage

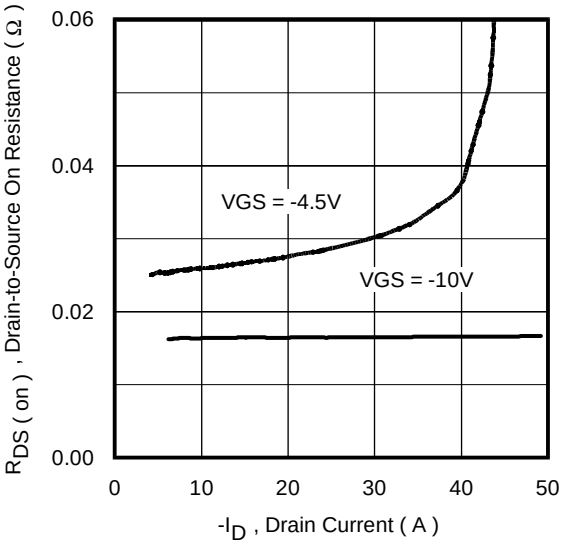


Fig 13. Typical On-Resistance Vs. Drain Current

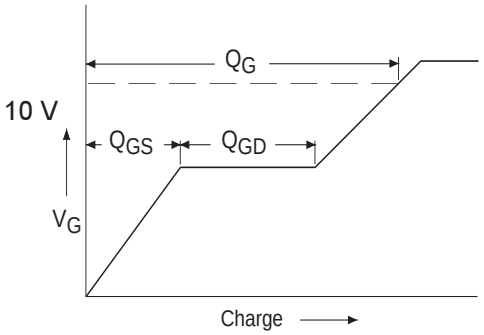


Fig 14a. Basic Gate Charge Waveform

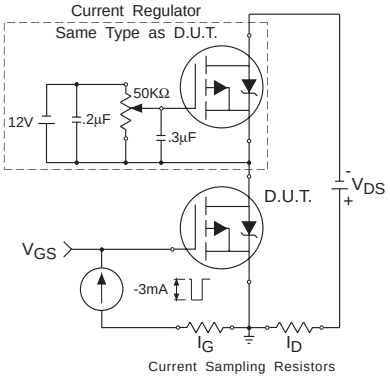
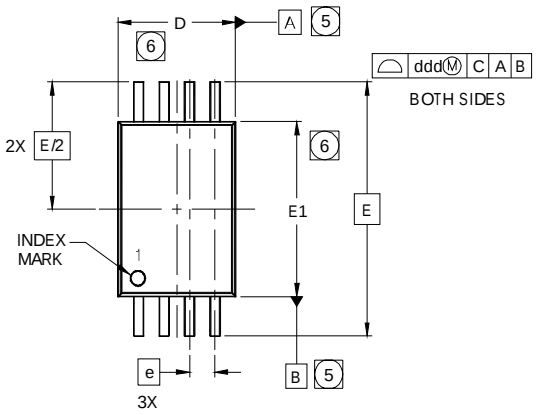


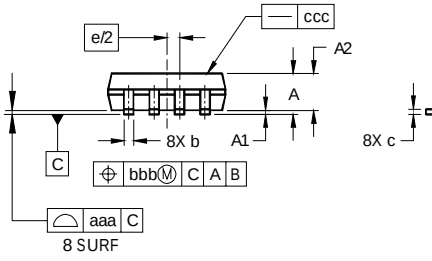
Fig 14b. Gate Charge Test Circuit

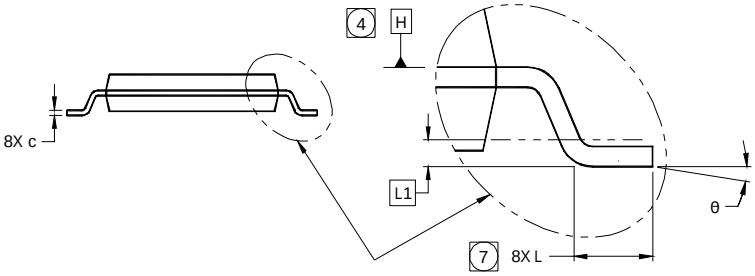
TSSOP8 Package Outline

Dimensions are shown in millimeters (inches)

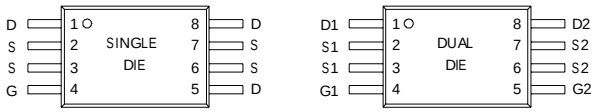


SYMBOL	MO-153AA DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.20	---	---	.0472
A1	0.05	---	0.15	.0020	---	.0059
A2	0.80	1.00	1.05	.032	.039	.041
b	0.19	---	0.30	.0075	---	.0118
c	0.09	---	0.20	.0036	---	.0078
D	2.90	3.00	3.10	.115	.118	.122
E	6.40 BSC			.251 BSC		
E1	4.30	4.40	4.50	.170	.173	.177
e	0.65 BSC			.0256		
L	0.45	0.60	0.75	.0178	.0236	.0290
L1	0.25 BSC			.010 BSC		
θ	0°	---	8°	0°	---	8°
aaa	0.10			.0039		
bbb	0.10			.0039		
ccc	0.05			.0019		
ddd	0.20			.0078		





LEAD ASSIGNMENTS

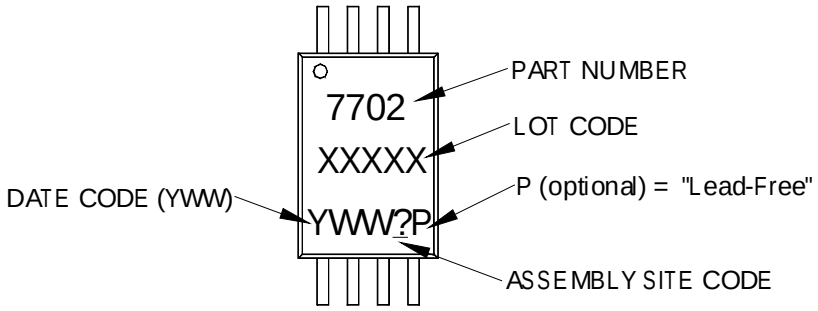


NOTES

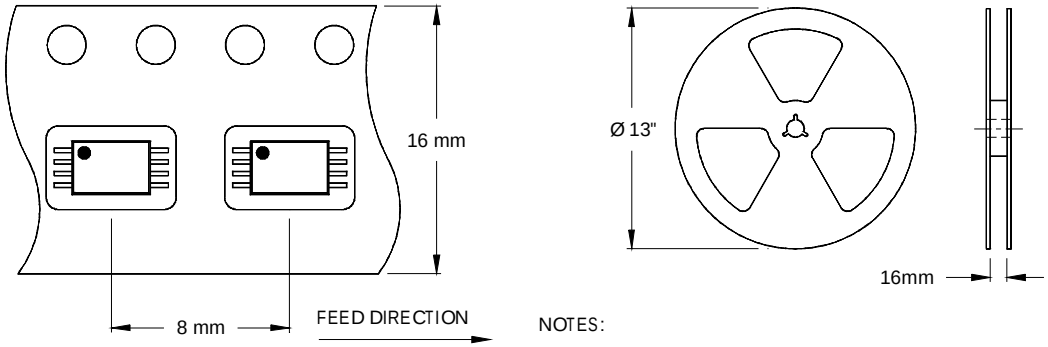
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
2. DIMENSIONS ARE SHOWN IN MILLIMETERS AND INCHES.
3. CONTROLLING DIMENSION: MILLIMETER.
4. DATUM PLANE H IS LOCATED AS SHOWN.
5. DATUM A AND B TO BE DETERMINED AT DATUM PLANE H.
6. DIMENSIONS D AND E1 ARE MEASURED AT DATUM PLANE H.
7. DIMENSION L IS THE LEAD LENGTH FOR SOLDERING TO A SUBSTRATE.
8. OUTLINE CONFORMS TO JEDEC OUTLINE M0-153AA.

TSSOP8 Part Marking Information

EXAMPLE: THIS IS AN IRF7702



TSSOP-8 Tape and Reel Information



NOTES:
1. TAPE & REEL 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.
Qualification Standards can be found on IR's Web site.

International
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