PD - 95863

International
IOR Rectifier

SMPS MOSFET

IRF6218S
IRF6218L

HEXFET® Power MOSFET

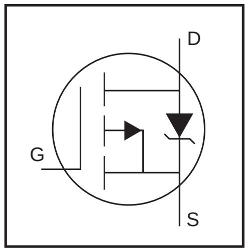
Applications

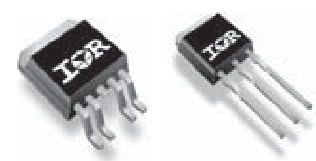
- Reset Switch for Active Clamp Reset DC-DC converters

V_{DSS}	$R_{DS(on)}$ max	I_D
-150V	150mΩ@V_{GS} = -10V	-27A

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





D[2]Pak
IRF6218S

TO-262
IRF6218L

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	-150	V
V_{GS}	Gate-to-Source Voltage	± 20	
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	-27	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	-19	
I_{DM}	Pulsed Drain Current ①	-110	
P_D @T_C = 25°C	Maximum Power Dissipation	250	W
	Linear Derating Factor	1.6	W/°C
dv/dt	Peak Diode Recovery dv/dt ⑥	8.2	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 175	°C
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case ⑤	——	0.61	°C/W
$R_{\theta JA}$	Junction-to-Ambient (PCB Mounted, steady state)⑤⑥	——	40	

Notes ① through ⑥ are on page 9

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	——	-0.17	——	V/°C	Reference to 25°C, I_D = -1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	120	150	mΩ	V_{GS} = -10V, I_D = -16A ④
$V_{GS(th)}$	Gate Threshold Voltage	-3.0	——	-5.0	V	V_{DS} = V_{GS}, I_D = -250µA
I_{DSS}	Drain-to-Source Leakage Current	——	——	-25	µA	V_{DS} = -120V, V_{GS} = 0V
		——	——	-250		V_{DS} = -120V, V_{GS} = 0V, T_J = 150°C
I_{GSS}	Gate-to-Source Forward Leakage	——	——	-100	nA	V_{GS} = -20V
	Gate-to-Source Reverse Leakage	——	——	100		V_{GS} = 20V

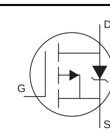
Dynamic @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
gfs	Forward Transconductance	11	——	——	S	V_{DS} = -50V, I_D = -16A
Q_g	Total Gate Charge	——	71	110	nC	I_D = -16A
Q_{gs}	Gate-to-Source Charge	——	21	——		V_{DS} = -120V
Q_{gd}	Gate-to-Drain ("Miller") Charge	——	32	——		V_{GS} = -10V ④
$t_{d(on)}$	Turn-On Delay Time	——	21	——	ns	V_{DD} = -75V
t_r	Rise Time	——	70	——		I_D = -16A
$t_{d(off)}$	Turn-Off Delay Time	——	35	——		R_G = 3.9Ω
t_f	Fall Time	——	30	——		V_{GS} = -10V ④
C_{iss}	Input Capacitance	——	2210	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	370	——		V_{DS} = -25V
C_{rss}	Reverse Transfer Capacitance	——	89	——		f = 1.0MHz
C_{oss}	Output Capacitance	——	2220	——		V_{GS} = 0V, V_{DS} = -1.0V, f = 1.0MHz
C_{oss}	Output Capacitance	——	170	——		V_{GS} = 0V, V_{DS} = -120V, f = 1.0MHz
C_{oss} eff.	Effective Output Capacitance	——	340	——		V_{GS} = 0V, V_{DS} = 0V to -120V

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy②	——	210	mJ
I_{AR}	Avalanche Current ①	——	-16	A

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	——	——	-27	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	——	——	-110		
V_{SD}	Diode Forward Voltage	——	——	-1.6	V	T_J = 25°C, I_S = -16A, V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	——	150	——	ns	T_J = 25°C, I_F = -16A, V_{DD} = -25V
Q_{rr}	Reverse Recovery Charge	——	860	——	nC	di/dt = -100A/µs ④

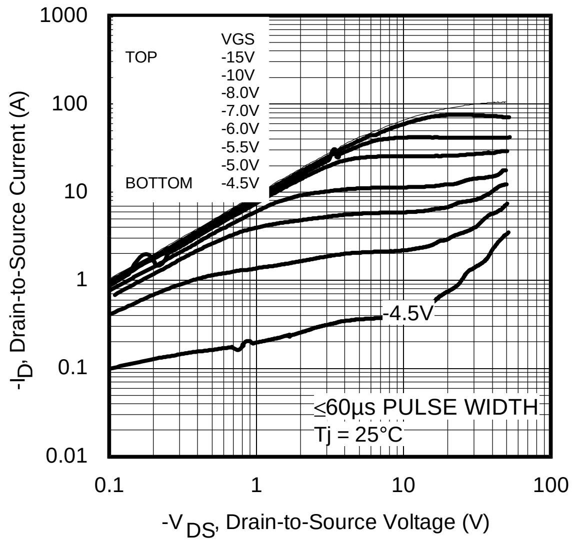


Fig 1. Typical Output Characteristics

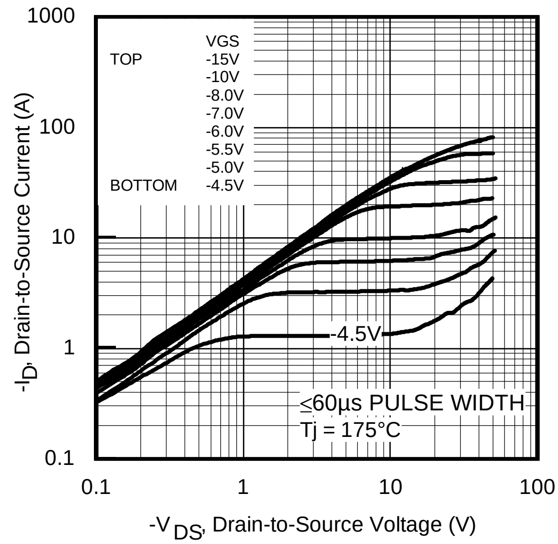


Fig 2. Typical Output Characteristics

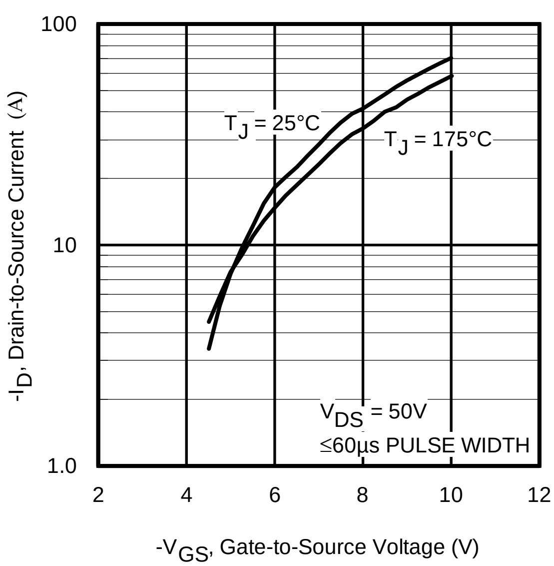


Fig 3. Typical Transfer Characteristics

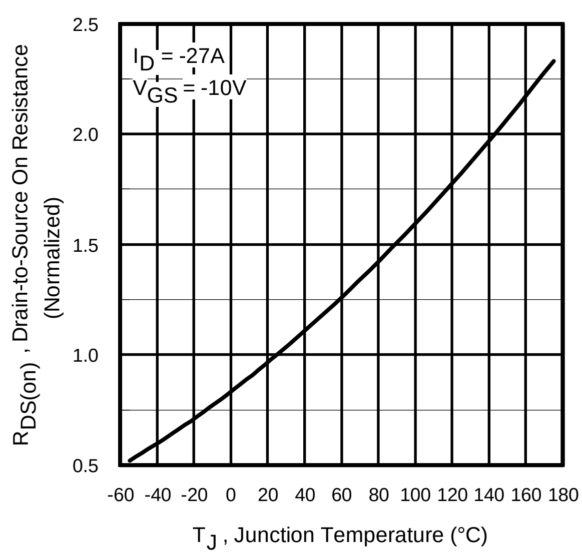


Fig 4. Normalized On-Resistance vs. Temperature

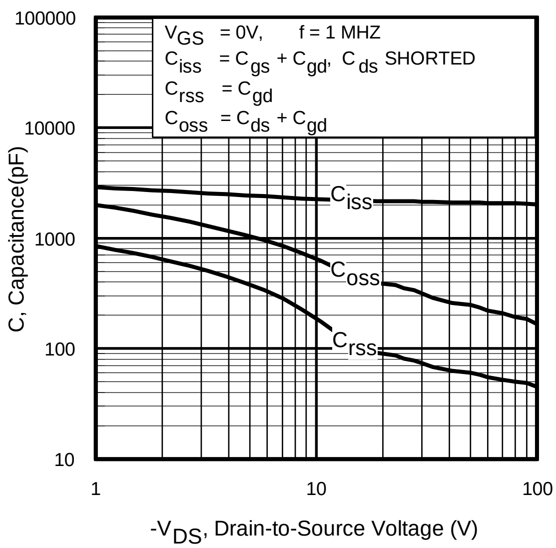


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

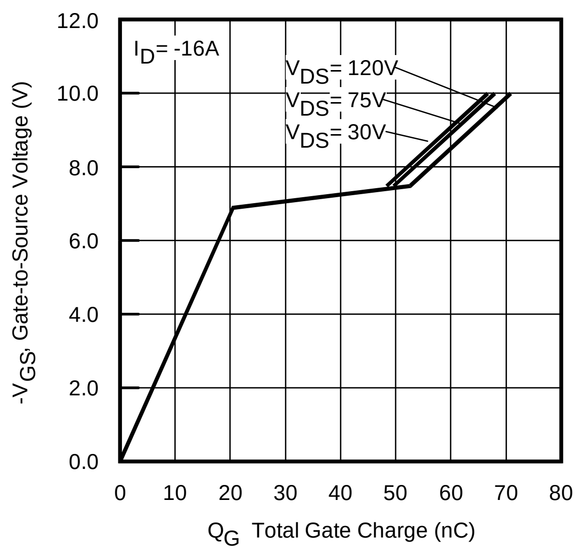


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

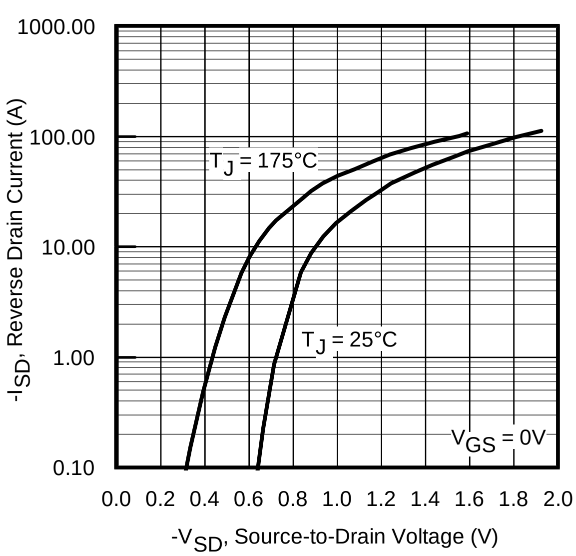


Fig 7. Typical Source-Drain Diode Forward Voltage

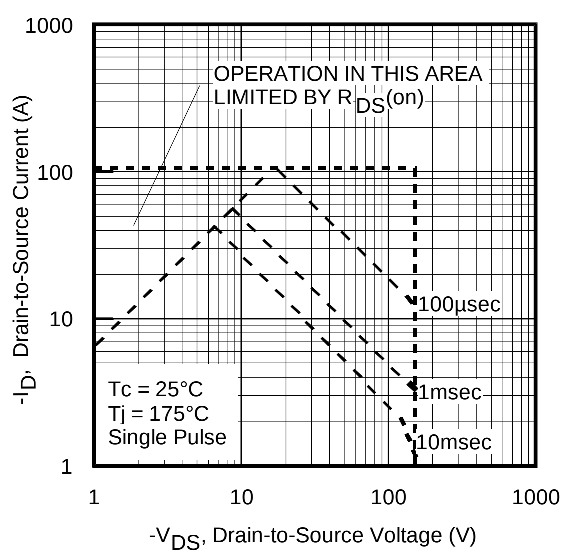


Fig 8. Maximum Safe Operating Area

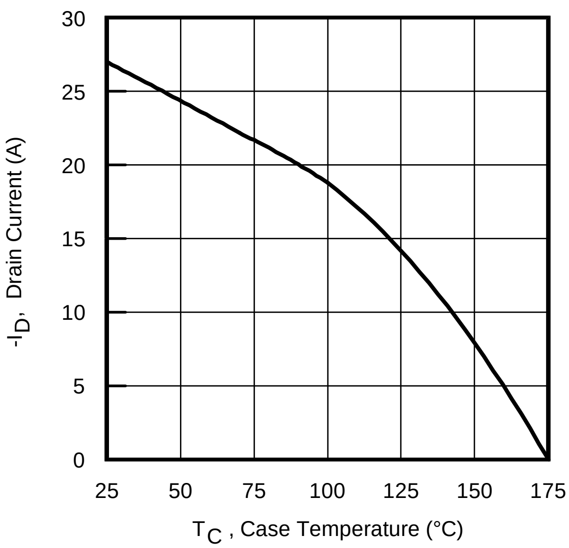


Fig 9. Maximum Drain Current vs. Ambient Temperature

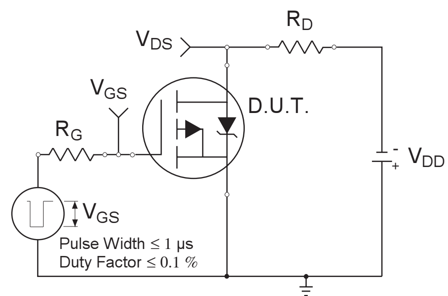


Fig 10a. Switching Time Test Circuit

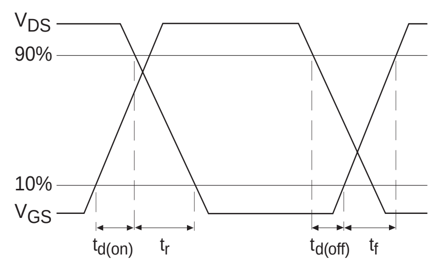


Fig 10b. Switching Time Waveforms

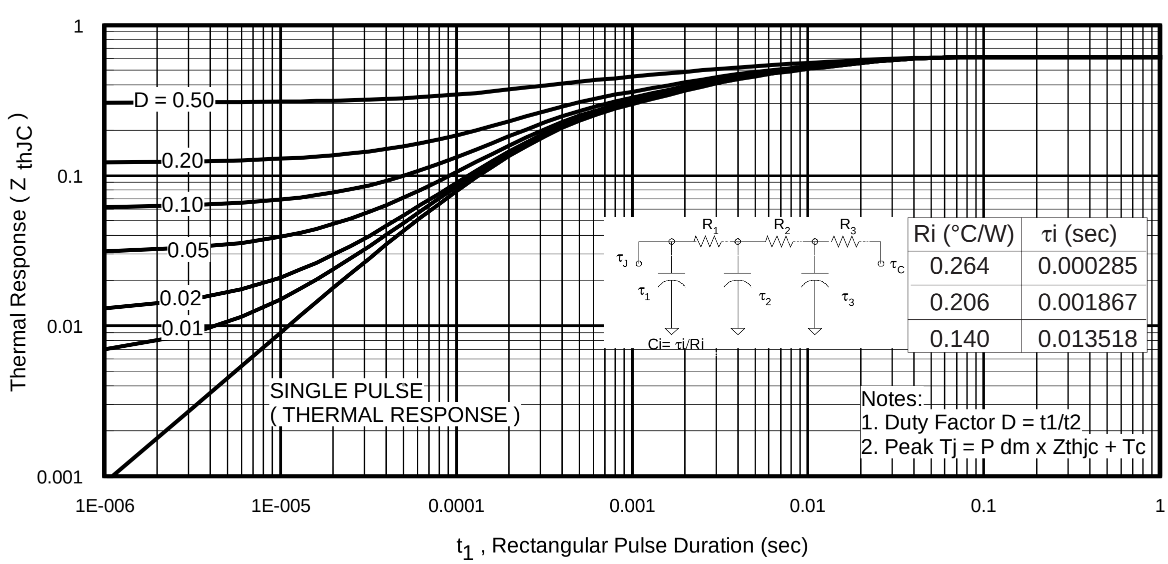


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

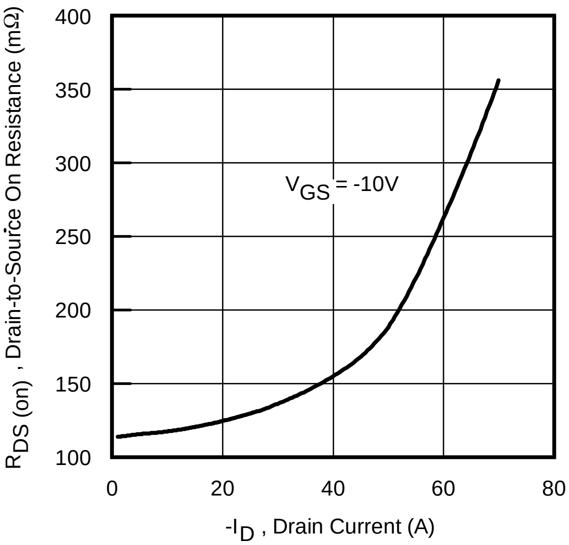


Fig 12. On-Resistance vs. Drain Current

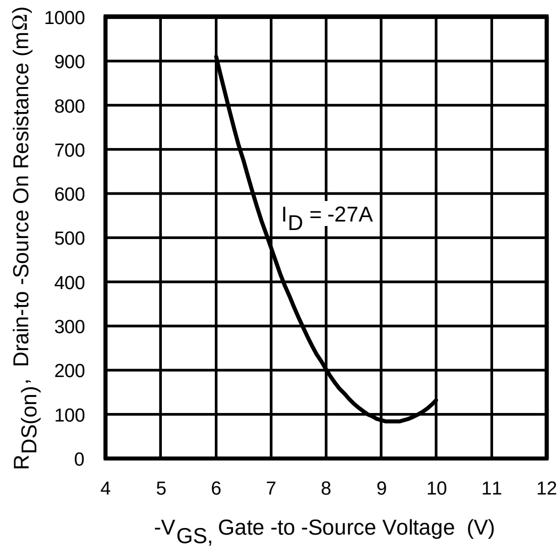


Fig 13. On-Resistance vs. Gate Voltage

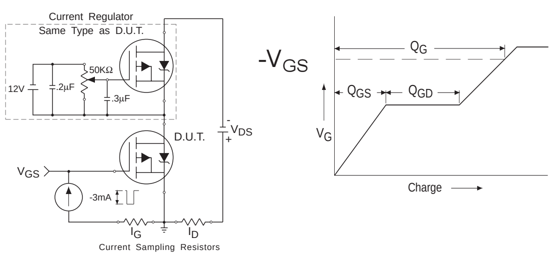


Fig 14a&b. Basic Gate Charge Test Circuit and Waveform

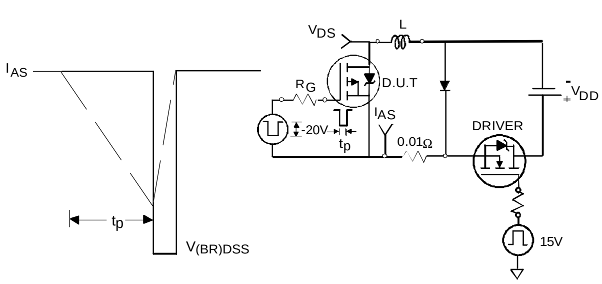


Fig 15a&b. Unclamped Inductive Test circuit and Waveforms

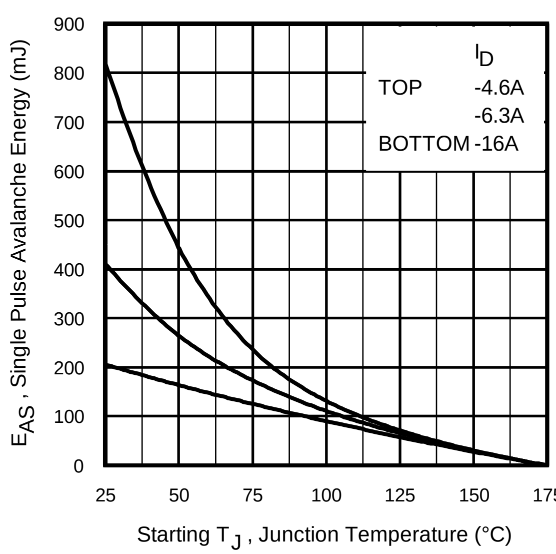
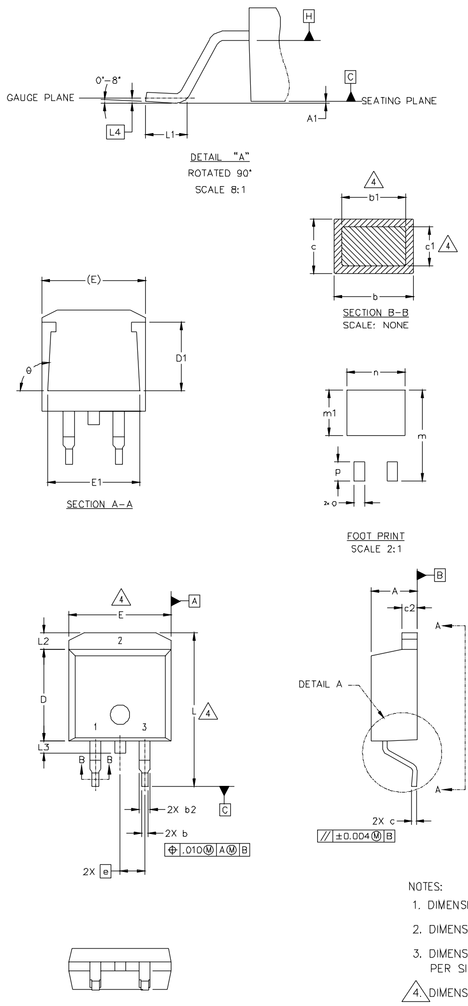


Fig 15c. Maximum Avalanche Energy vs. Drain Current

D²Pak Package Outline

Dimensions are shown in millimeters (inches)



SYMBOL	MILLIMETERS MIN.	MILLIMETERS MAX.	INCHES MIN.	INCHES MAX.	NOTES
A	4.06	4.83	.160	.190	
A1		0.127		.005	
b	0.51	0.99	.020	.039	
b1	0.51	0.89	.020	.035	4
b2	1.14	1.40	.045	.055	
c	0.43	0.63	.017	.025	
c1	0.38	0.74	.015	.029	4
c2	1.14	1.40	.045	.055	
D	8.51	9.65	.335	.380	3
D1	5.33		.210		
E	9.65	10.67	.380	.420	3
E1	6.22		.245		
e	2.54 BSC		.100 BSC		
L	14.61	15.88	.575	.625	
L1	1.78	2.79	.070	.110	
L2		1.65		.065	
L3	1.27	1.78	.050	.070	
L4	0.25 BSC		.010 BSC		
m	17.78		.700		
m1	8.89		.350		
n	11.43		.450		
o	2.08		.082		
p	3.81		.150		
θ	90°	93°	90°	93°	

LEAD ASSIGNMENTS

HEXFET	IGBTs, CoPACK	DIODES
1.- GATE	1.- GATE	1.- ANODE *
2.- DRAIN	2.- COLLECTOR	2.- CATHODE
3.- SOURCE	3.- EMITTER	3.- ANODE

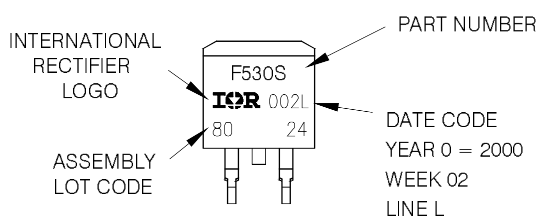
* PART DEPENDENT.

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
4. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.
5. CONTROLLING DIMENSION: INCH.

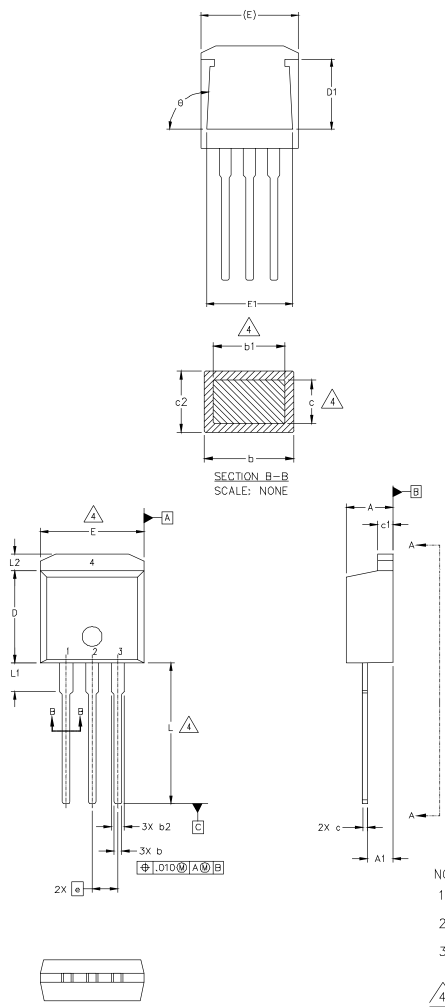
D²Pak Part Marking Information

EXAMPLE: THIS IS AN IRF530S WITH LOT CODE 8024
ASSEMBLED ON WW 02, 2000
IN THE ASSEMBLY LINE "L"



TO-262 Package Outline

Dimensions are shown in millimeters (inches)



SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	.160	.190	
A1	2.03	2.92	.080	.115	
b	0.51	0.99	.020	.039	
b1	0.51	0.89	.020	.035	4
b2	1.14	1.40	.045	.055	
c	0.38	0.63	.015	.025	4
c1	1.14	1.40	.045	.055	
c2	0.43	.063	.017	.029	
D	8.51	9.65	.335	.380	3
D1	5.33		.210		
E	9.65	10.67	.380	.420	3
E1	6.22		.245		
e	2.54 BSC		.100 BSC		
L	13.46	14.09	.530	.555	
L1	3.56	3.71	.140	.146	
L2		1.65		.065	

LEAD ASSIGNMENTS

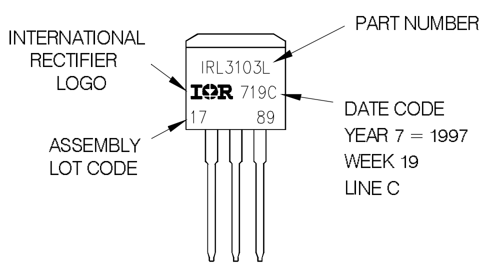
HEXFET	IGBT
1.– GATE	1- GATE
2.– DRAIN	2- COLLECTOR
3.– SOURCE	3- EMITTER
4.– DRAIN	

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
4. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.
5. CONTROLLING DIMENSION: INCH.

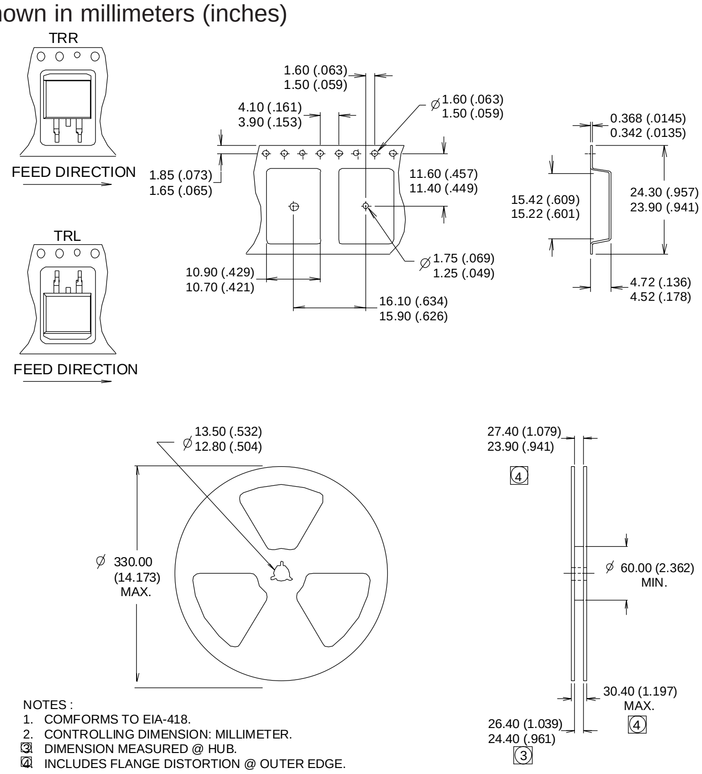
TO-262 Part Marking Information

EXAMPLE: THIS IS AN IRL3103L
LOT CODE 1789
ASSEMBLED ON WW 19, 1997
IN THE ASSEMBLY LINE "C"



D²Pak Tape & Reel Information

Dimensions are shown in millimeters (inches)



Notes:

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

② Starting $T_J = 25°C$, L = 1.6mH, $R_G = 25\Omega$, $I_{AS} = -17A$.

③ $I_{SD} \leq -17A$, di/dt ≤ -520A/µs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 175°C$.

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

⑤ R_θ is measured at T_J of approximately 90°C.

⑥ When mounted on 1" square PCB (FR-4 or G-10 Material). For recommended footprint and soldering techniques refer to application note #AN-994.

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.

International
IOR Rectifier

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