Features

- $V_{DS\ (V)}$=-55V
- $R_{DS(ON)} < 105m\Omega$ (V_{GS} =-10V)
- $R_{DS(ON)} < 170m\Omega$ (V_{GS} =-4.5V)
- Generation V Technology
- Ultra Low On-Resistance
- Surface Mount
- Dynamic dv/dt Rating
- Fast Switching
- Lead-Free

S1	1	8	D1
G1	2	7	D1
S2	3	6	D2
G2	4	5	D2

Top View

Description

The SOP-8 has been modified through a customized leadframe for enhanced thermal characteristics and multiple-die capability making it ideal in a variety of power applications. With these improvements, multiple devices can be used in an application with dramatically reduced board space. The package is designed for vapor phase, infra red, or wave soldering techniques. Power dissipation of greater than 0.8W is possible in a typical PCB mount application.

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain- Source Voltage	-55	V
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	-3.4	A
I_D @ T_C = 70°C	Continuous Drain Current, V_{GS} @ 10V	-2.7	
I_{DM}	Pulsed Drain Current ①	-27	
P_D @T_C = 25°C	Power Dissipation	2.0	W
P_D @T_C = 70°C	Power Dissipation	1.3	
	Linear Derating Factor	0.016	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
V_{GSM}	Gate-to-Source Voltage Single Pulse tp<10μs	30	V
E_{AS}	Single Pulse Avalanche Energy②	114	
dv/dt	Peak Diode Recovery dv/dt ③	5.0	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C
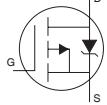
Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient⑤		62.5	°C/W

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)
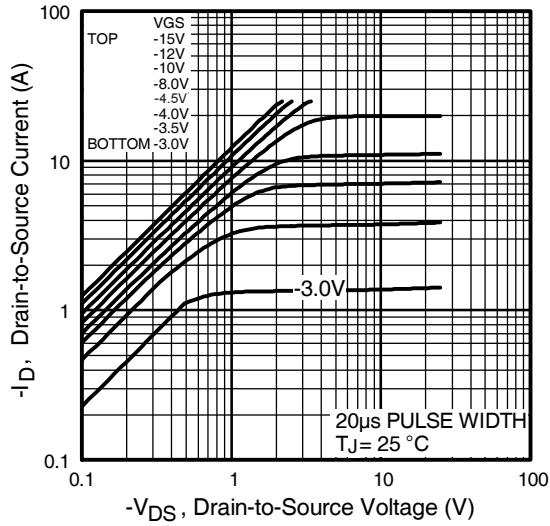
	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-55			V	V_{GS} = 0V, I_D = -250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient		-0.054		V/°C	Reference to 25°C, I_D = -1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance		95	105	mΩ	V_{GS} = -10V, I_D = -3.4A ④
			150	170		V_{GS} = -4.5V, I_D = -2.7A ④
$V_{GS(th)}$	Gate Threshold Voltage	-1.0			V	V_{DS} = V_{GS}, I_D = -250µA
g_{fs}	Forward Transconductance	3.3			S	V_{DS} = -10V, I_D = -3.1A
I_{DSS}	Drain-to-Source Leakage Current			-2.0	µA	V_{DS} = -55V, V_{GS} = 0V
				-25		V_{DS} = -55V, 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		26	38		I_D = -3.1A
Q_{gs}	Gate-to-Source Charge		3.0	4.5	nC	V_{DS} = -44V
Q_{gd}	Gate-to-Drain ("Miller") Charge		8.4	13		V_{GS} = -10V, See Fig. 10 ④
$t_{d(on)}$	Turn-On Delay Time		14	22		V_{DD} = -28V
t_r	Rise Time		10	15	ns	I_D = -1.0A
$t_{d(off)}$	Turn-Off Delay Time		43	64		R_G = 6.0Ω
t_f	Fall Time		22	32		R_D = 16Ω, ④
C_{iss}	Input Capacitance		690			V_{GS} = 0V
C_{oss}	Output Capacitance		210		pF	V_{DS} = -25V
C_{rss}	Reverse Transfer Capacitance		86			ƒ = 1.0MHz, See Fig. 9

Source-Drain Ratings and Characteristics
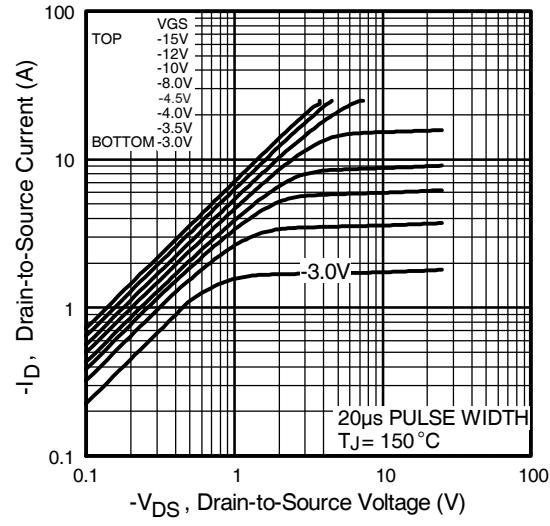
	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)			-2.0	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①			-27		
V_{SD}	Diode Forward Voltage			-1.2	V	T_J = 25°C, I_S = -2.0A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time		54	80	ns	T_J = 25°C, I_F = -2.0A
Q_{rr}	Reverse Recovery Charge		85	130	nC	di/dt = -100A/µs ③

Notes:
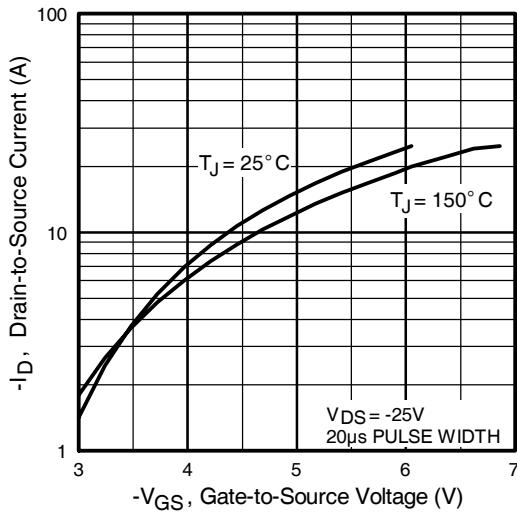
① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)

② Starting T_J = 25°C, L = 20mH
   R_G = 25Ω, I_{AS} = -3.4A. (See Figure 8)

③ I_{SD} ≤ -3.4A, di/dt ≤ -150A/µs, V_{DD} ≤ $V_{(BR)DSS}$,
   T_J ≤ 150°C

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

⑤ When mounted on 1 inch square copper board, t<10 sec

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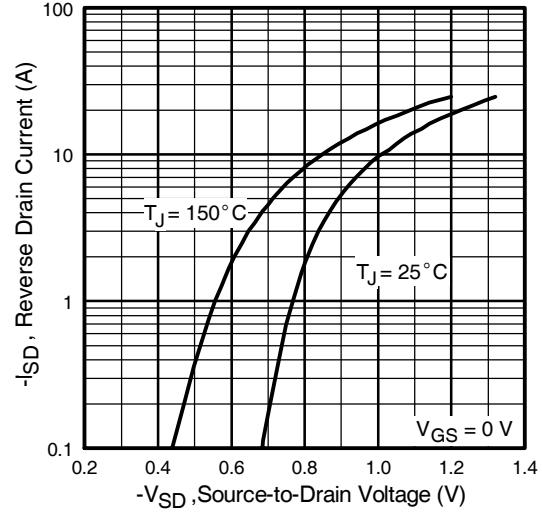
Fig 1. Typical Output Characteristics
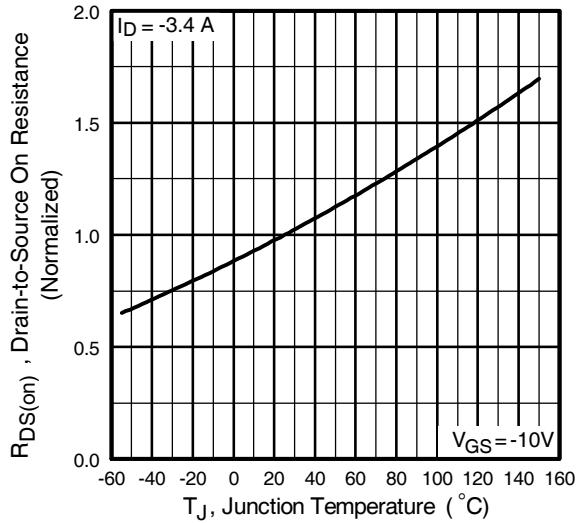

Fig 2. Typical Output Characteristics
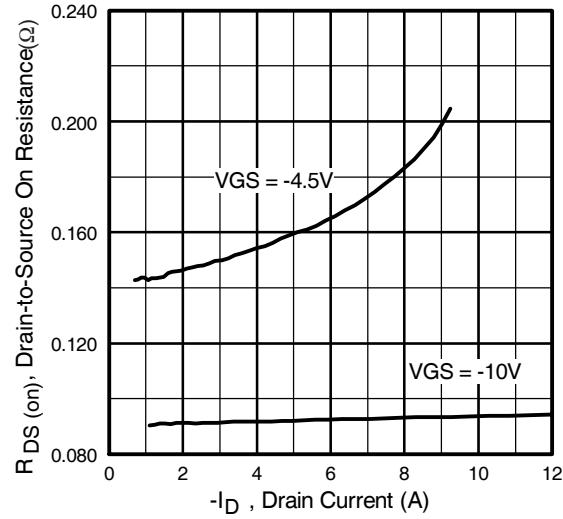
Fig 3. Typical Transfer Characteristics
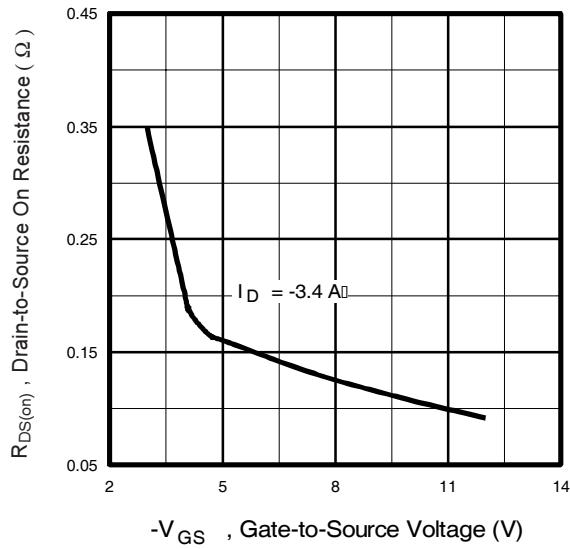
Fig 4. Typical Source-Drain Diode
Forward Voltage

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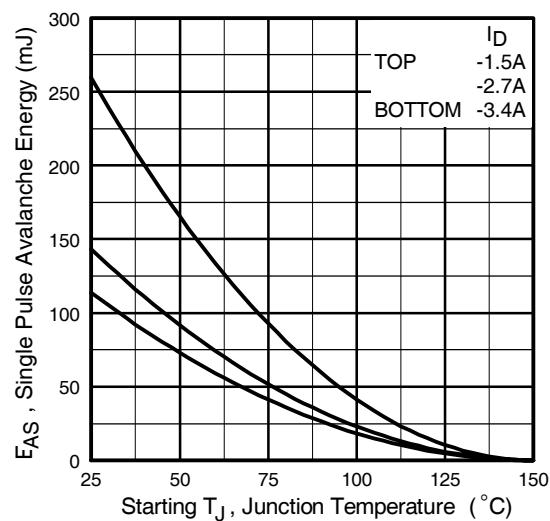
**Fig 5.** Normalized On-Resistance Vs. Temperature
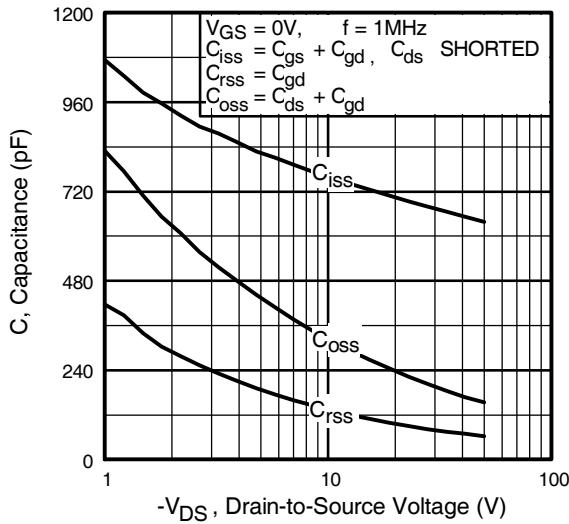
Fig 6. Typical On-Resistance Vs. Drain Current
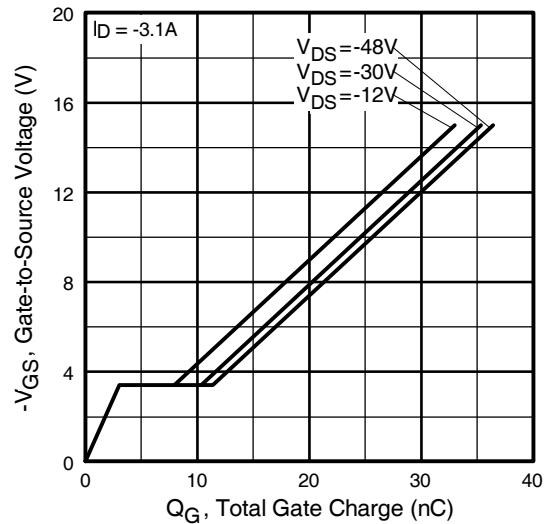
**Fig 7.** Typical On-Resistance Vs. Gate Voltage
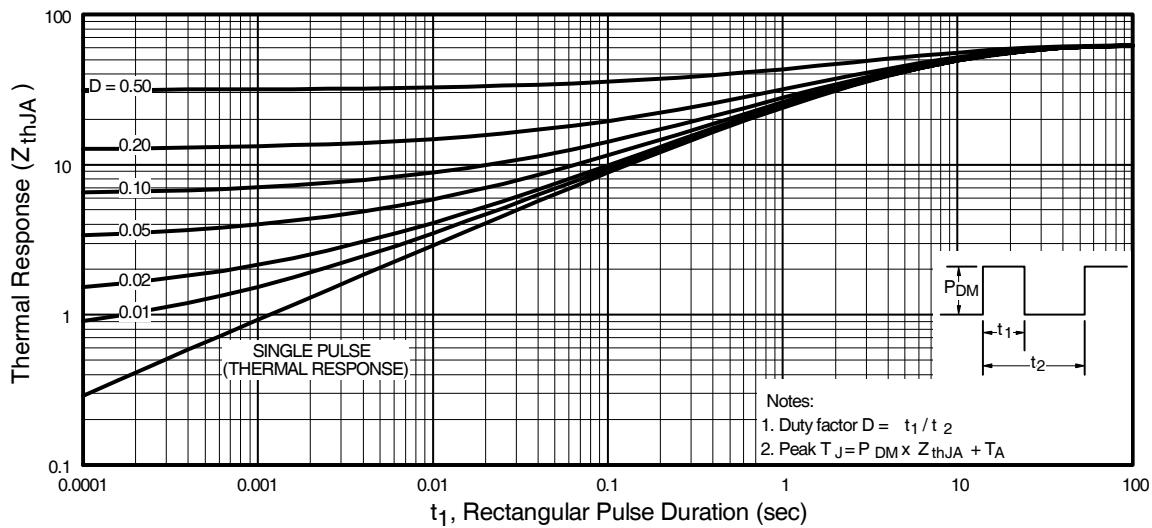
Fig 8. Maximum Avalanche Energy Vs. Drain Current

Fig 9. Typical Capacitance Vs.
Drain-to-Source Voltage
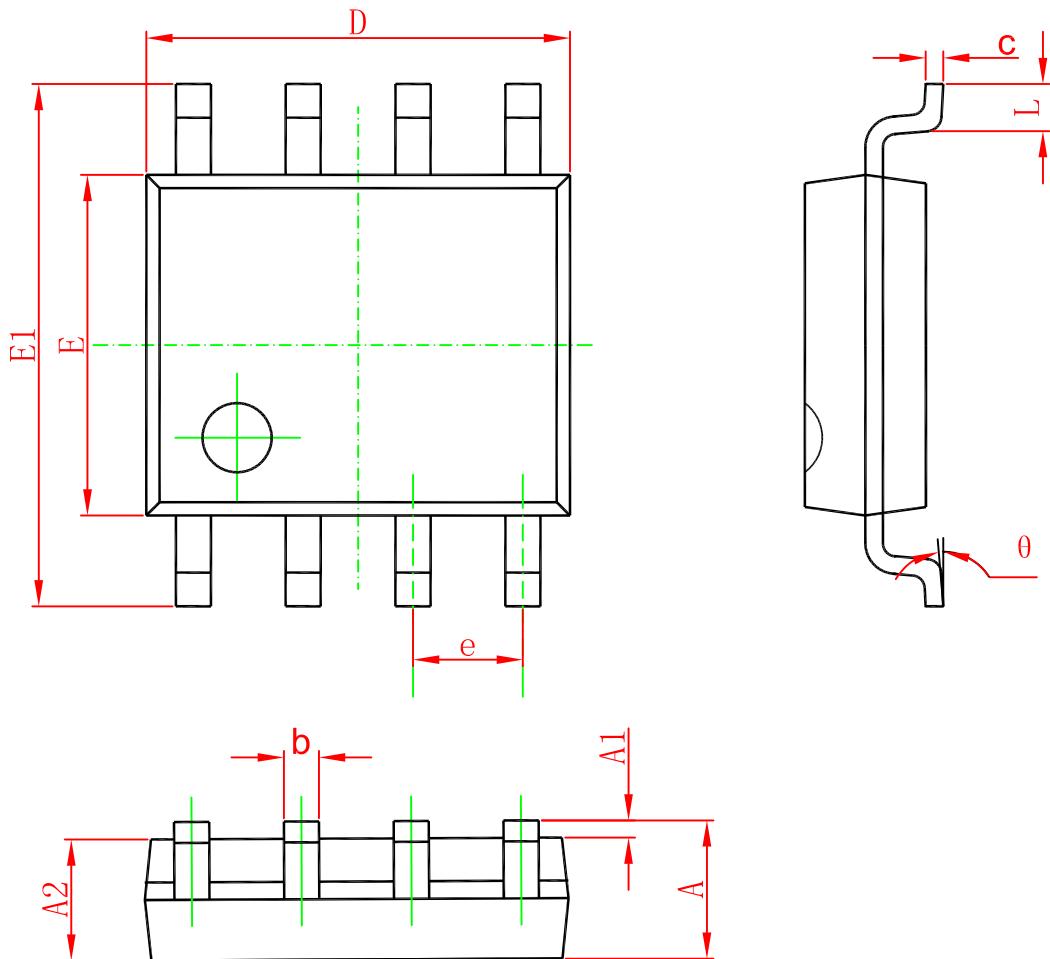
Fig 10. Typical Gate Charge Vs.
Gate-to-Source Voltage
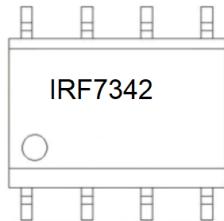
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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SOP-8

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Marking

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        IRF7342
         ○
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Ordering information

Order code	Package	Baseqty	Deliverymode
IRF7342TR	SOP-8	3000	Tape and reel