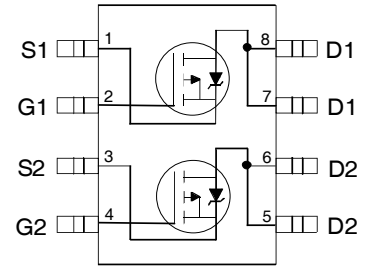


Features

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



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
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	-3.4	A
$I_D @ T_C = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	-2.7	
I_{DM}	Pulsed Drain Current ①	-27	
$P_D @ T_C = 25^\circ C$	Power Dissipation	2.0	W
$P_D @ T_C = 70^\circ C$	Power Dissipation	1.3	
	Linear Derating Factor	0.016	
V_{GS}	Gate-to-Source Voltage	± 20	V
V_{GSM}	Gate-to-Source Voltage Single Pulse $tp < 10\mu s$	30	V
E_{AS}	Single Pulse Avalanche Energy ②	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	$^\circ C$

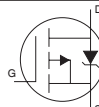
Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ④		62.5	$^\circ C/W$

Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-55			V	$V_{GS} = 0V, I_D = -250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient		-0.054		V/ $^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D = -1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance		95	105	m Ω	$V_{GS} = -10V, I_D = -3.4A$ ④
			150	170		$V_{GS} = -4.5V, I_D = -2.7A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	-1.0			V	$V_{DS} = V_{GS}, I_D = -250\mu A$
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		$V_{DS} = -55V, V_{GS} = 0V, T_J = 55^\circ\text{C}$
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	nC	$I_D = -3.1A$
Q_{gs}	Gate-to-Source Charge		3.0	4.5		$V_{DS} = -44V$
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	ns	$V_{DD} = -28V$
t_r	Rise Time		10	15		$I_D = -1.0A$
$t_{d(off)}$	Turn-Off Delay Time		43	64		$R_G = 6.0\Omega$
t_f	Fall Time		22	32		$R_D = 16\Omega$, ④
C_{iss}	Input Capacitance		690		pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance		210			$V_{DS} = -25V$
C_{rss}	Reverse Transfer Capacitance		86			$f = 1.0\text{MHz}$, 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	$T_J = 25^\circ\text{C}, I_S = -2.0A, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time		54	80	ns	$T_J = 25^\circ\text{C}, I_F = -2.0A$
Q_{rr}	Reverse Recovery Charge		85	130	nC	$di/dt = -100A/\mu s$ ③

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)
- ② Starting $T_J = 25^\circ\text{C}$, $L = 20\text{mH}$
 $R_G = 25\Omega, I_{AS} = -3.4A$. (See Figure 8)
- ③ $I_{SD} \leq -3.4A, di/dt \leq -150A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 150^\circ\text{C}$
- ④ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.
- ⑤ When mounted on 1 inch square copper board, $t < 10\text{ sec}$

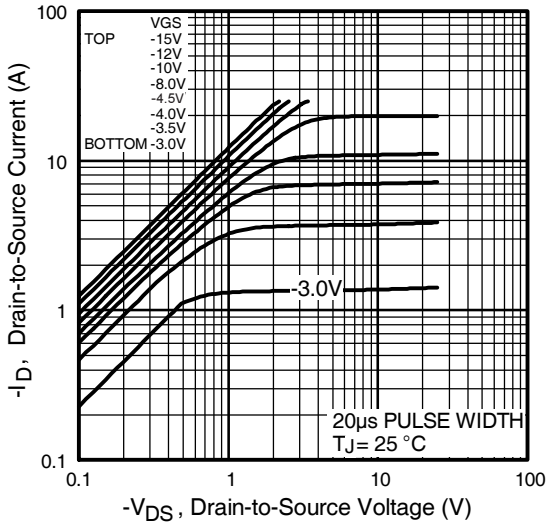


Fig 1. Typical Output Characteristics

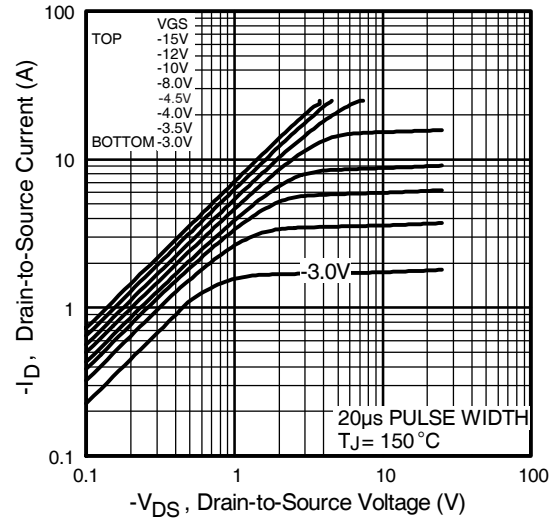


Fig 2. Typical Output Characteristics

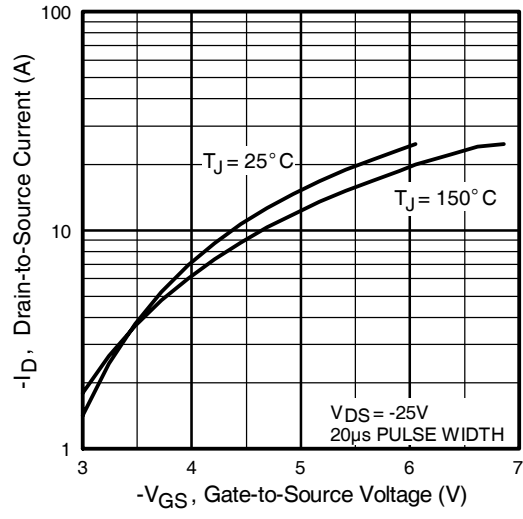


Fig 3. Typical Transfer Characteristics

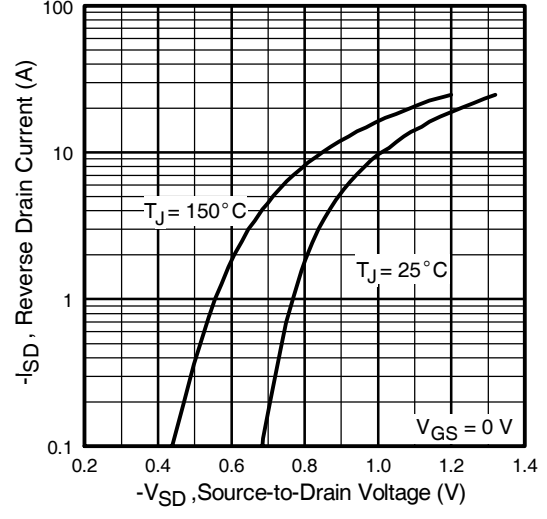


Fig 4. Typical Source-Drain Diode Forward Voltage

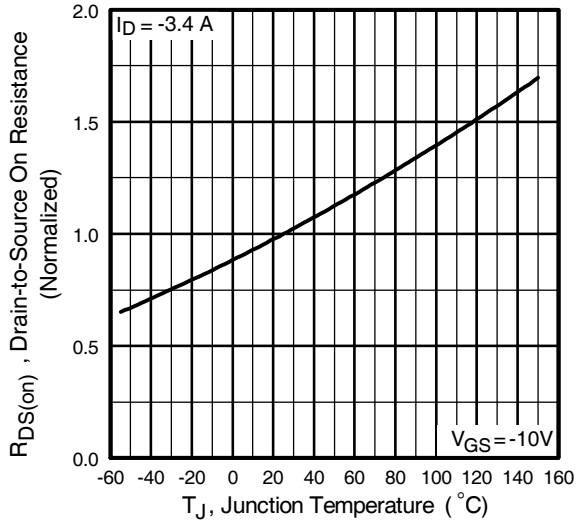


Fig 5. Normalized On-Resistance Vs. Temperature

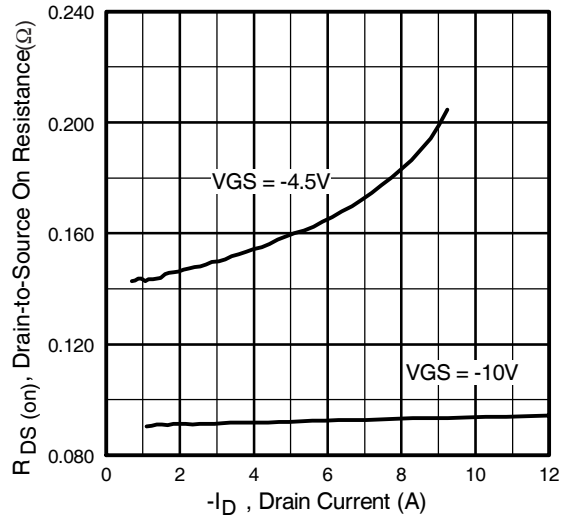


Fig 6. Typical On-Resistance Vs. Drain Current

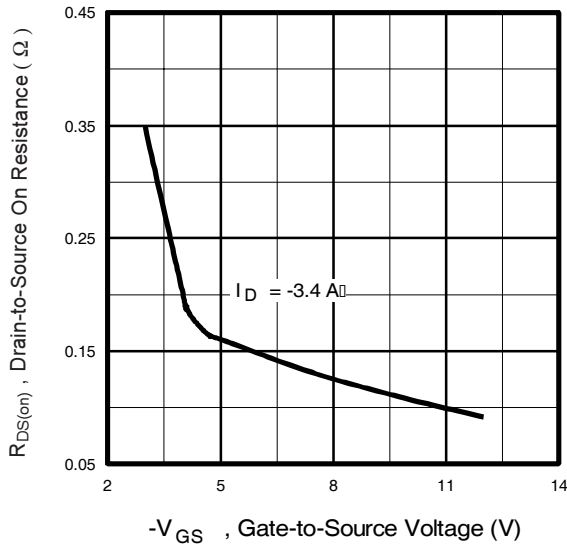


Fig 7. Typical On-Resistance Vs. Gate Voltage

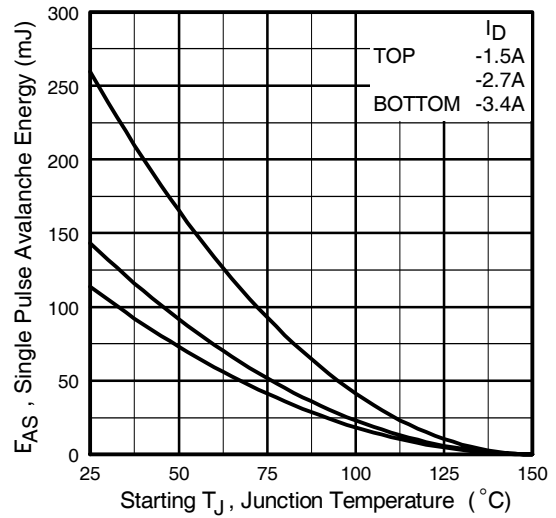


Fig 8. Maximum Avalanche Energy Vs. Drain Current

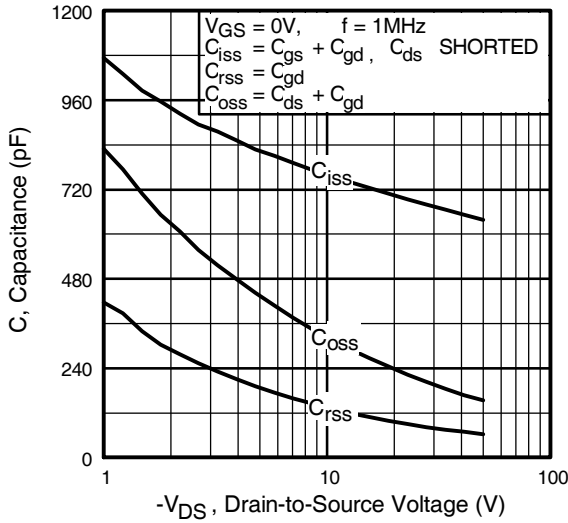


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

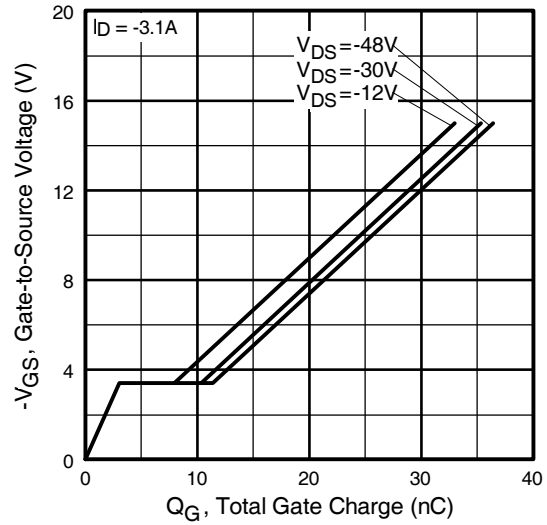


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

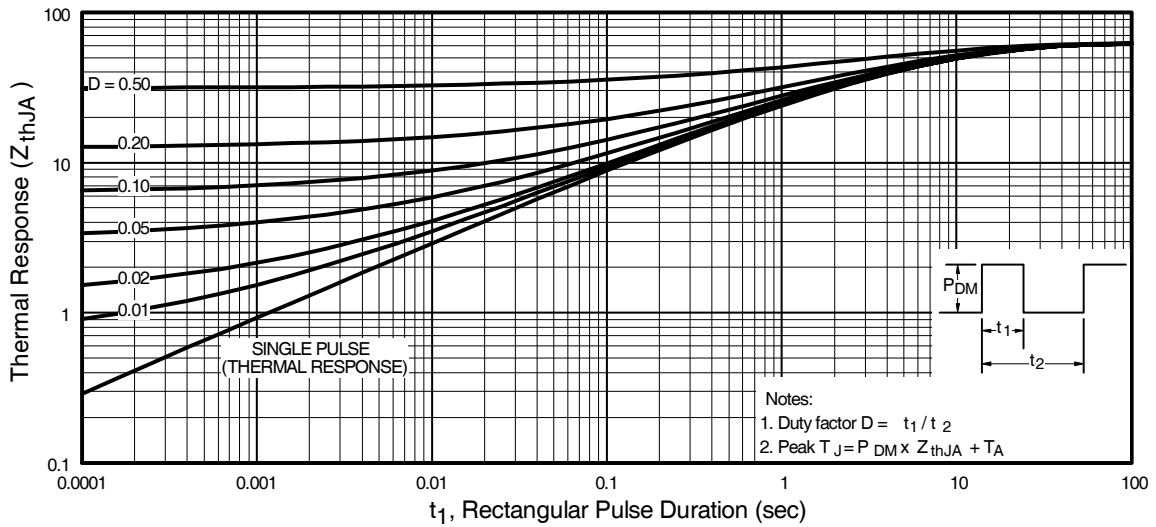
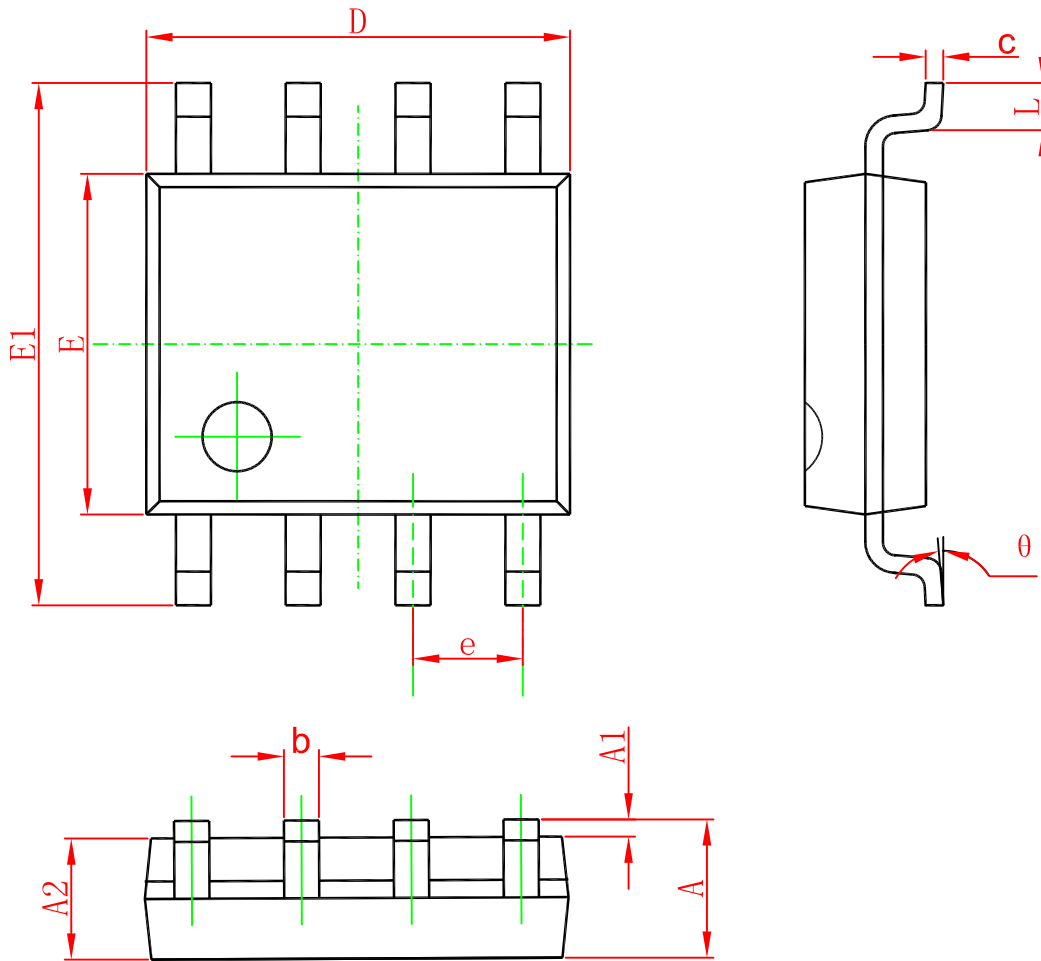


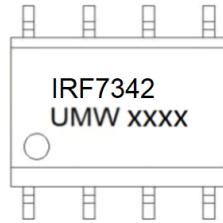
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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



Ordering information

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