

1. 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, infrared, or wave soldering techniques.

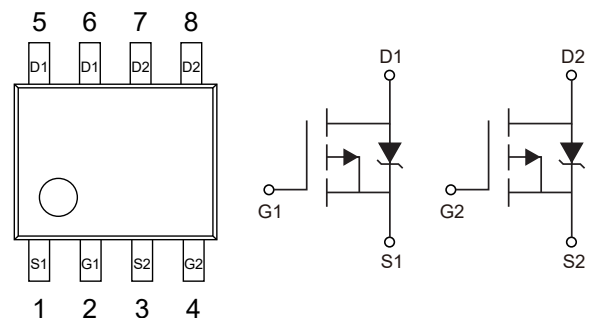
2. Features

- $V_{DS(V)} = -30V$
- $I_D = -4.9A$
- $R_{DS(ON)} < 42m\Omega (V_{GS} = -10)$
- $R_{DS(ON)} < 77m\Omega (V_{GS} = -4.5V)$
- Generation V Technology
- Ultra Low On-Resistance
- Surface Mount
- Fully Avalanche Rated
- Lead-Free

3. Pinning information

Pin	Symbol	Description
2,4	G1,G2	GATE
1,3	S1,S2	SOURCE
5,6,7,8	D1,D2	DRAIN

SOP-8





4. Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ⑤	$T_A=25^\circ\text{C}$	I_D	-4.9	A
	$T_A=70^\circ\text{C}$		-3.9	
Pulsed Drain Current		I_{DM}	-30	
Continuous Source Current (Diode Conduction)		I_S	-2.5	
Maximum Power Dissipation ⑤	$T_A=25^\circ\text{C}$	P_D	2	W
	$T_A=70^\circ\text{C}$		1.3	W
Single Pulse Avalanche Energy		E_{AS}	140	mJ
Avalanche Current		I_{AR}	-2.8	A
Repetitive Avalanche Energy		E_{AR}	0.2	mJ
Peak Diode Recovery dv/dt ③		dv/dt	-5	V/ns
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

5. Thermal Resistance Rating

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ⑤	$R_{\theta JA}$		62.5	$^\circ\text{C/W}$



6. Electrical Characteristics $T_J=25^{\circ}\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-250\mu\text{A}$, $V_{GS}=0\text{V}$	-30			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS}/T_J$	$I_D=-1\text{mA}$, Reference to 25°C		0.022		$\text{V}/^{\circ}\text{C}$
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10\text{V}$, $I_D=-4.9\text{A}$ ④		42	60	$\text{m}\Omega$
		$V_{GS}=-4.5\text{V}$, $I_D=-3.6\text{A}$ ④		77	100	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-1			V
Forward Transconductance	g_{FS}	$V_{DS}=-15\text{V}$, $I_D=-4.9\text{A}$		7.7		S
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=-24\text{V}$, $V_{GS}=0\text{V}$			-1	μA
		$V_{DS}=-24\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^{\circ}\text{C}$			-25	
Gate-to-Source Forward Leakage	I_{GSS}	$V_{GS}=-20\text{V}$			-100	nA
Gate-to-Source Reverse Leakage		$V_{GS}=20\text{V}$			100	
Total Gate Charge	Q_g	$I_D=-4.9\text{A}$		23	34	nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=-15\text{V}$, $V_{GS}=-10\text{V}$		3.8	5.7	
Gate-to-Drain ("Miller") Charge	Q_{gd}	See Fig. 10 ④		5.9	8.9	
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=-15\text{V}$		13	19	ns
Rise Time	t_r	$I_D=-1\text{A}$		13	20	ns
Turn-Off Delay Time	$t_{D(off)}$	$R_G=6\Omega$		34	51	ns
Fall Time	t_f	$R_D=15\Omega$ ④		32	48	ns
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$		710		pF
Output Capacitance	C_{oss}	$V_{DS}=-25\text{V}$		380		pF
Reverse Transfer Capacitance	C_{rss}	$f=1.0\text{MHz}$, See Fig. 5		180		pF



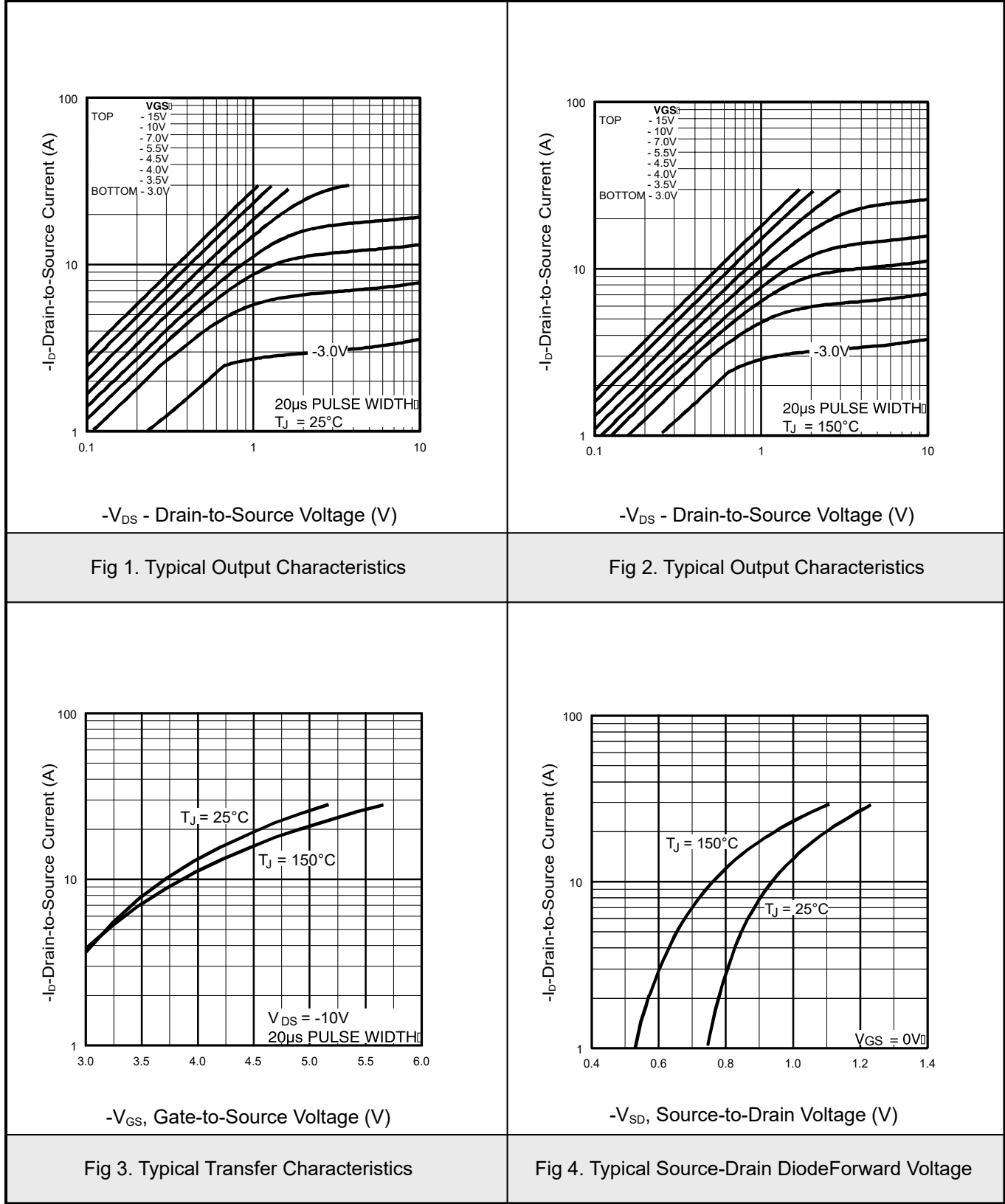
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			-2.5	A
Pulsed Source Current (Body Diode) ①	I_{SM}				-30	
Diode Forward Voltage	V_{SD}	$T_J=25^{\circ}\text{C}, I_S=1.7\text{A}, V_{GS}=0\text{V}$ ③		-0.78	-1	V
Reverse Recovery Time	t_{rr}	$T_J=25^{\circ}\text{C}, I_F=1.7\text{A}$		44	66	ns
Reverse Recovery Charge	Q_{rr}	$di/dt=100\text{A}/\mu\text{s}$ ③		42	63	nC

Notes:

- ① Repetitive rating; pulse width limited by max.junction temperature.(See fig.11)
- ② Starting $T_J=25^{\circ}\text{C}$, $L=35\text{mH}$, $R_G=25\Omega$, $I_{AS}=-2.8\text{A}$.
- ③ $I_{SD}\leq -2.8\text{A}$, $di/dt\leq 150\text{A}/\mu\text{s}$, $V_{DD}\leq V_{(BR)DSS}$, $T_J\leq 150^{\circ}\text{C}$
- ④ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- ⑤ Surface mounted on FR-4 board, $t\leq 10\text{sec}$.

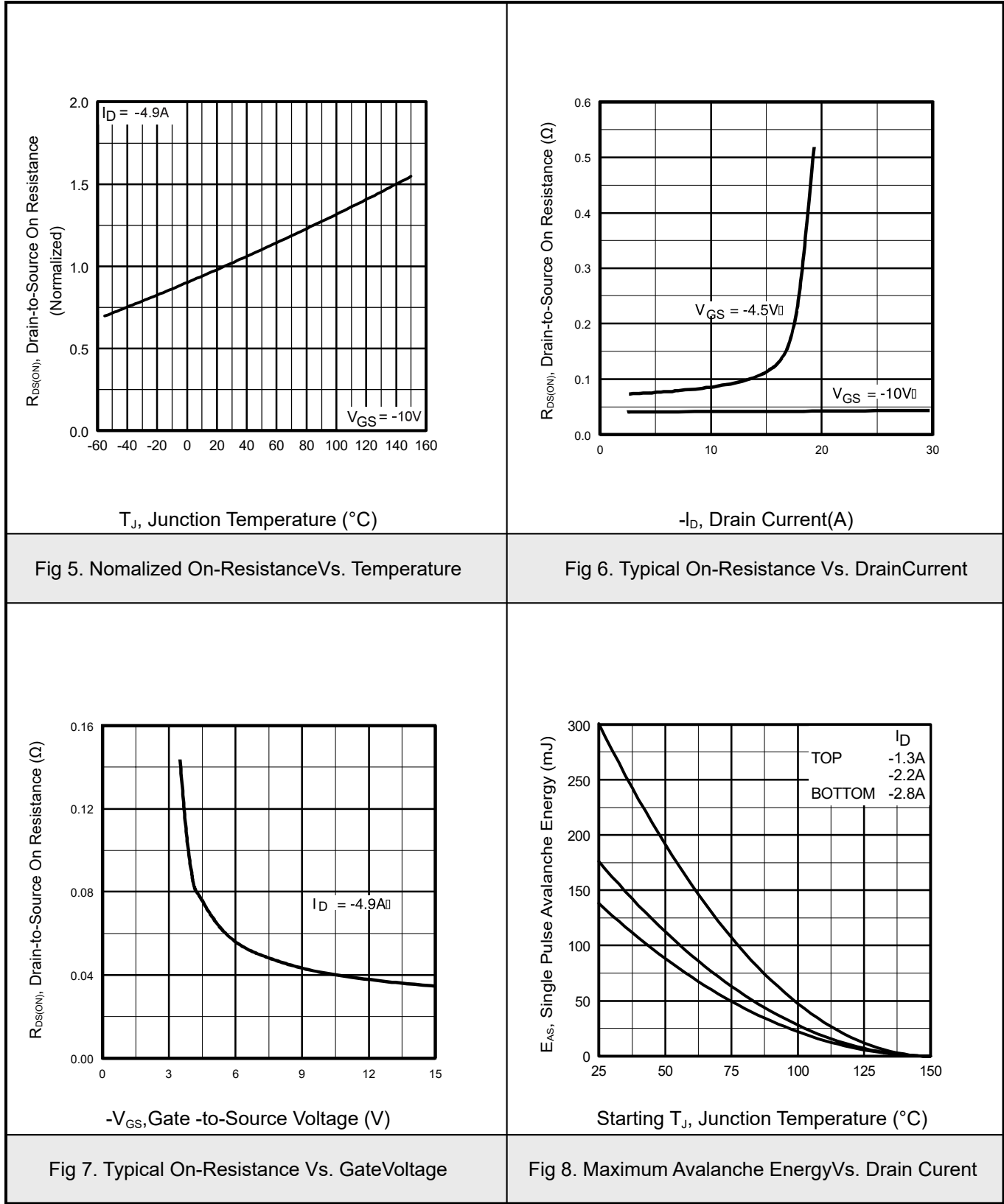


7.1 Typical Characteristics



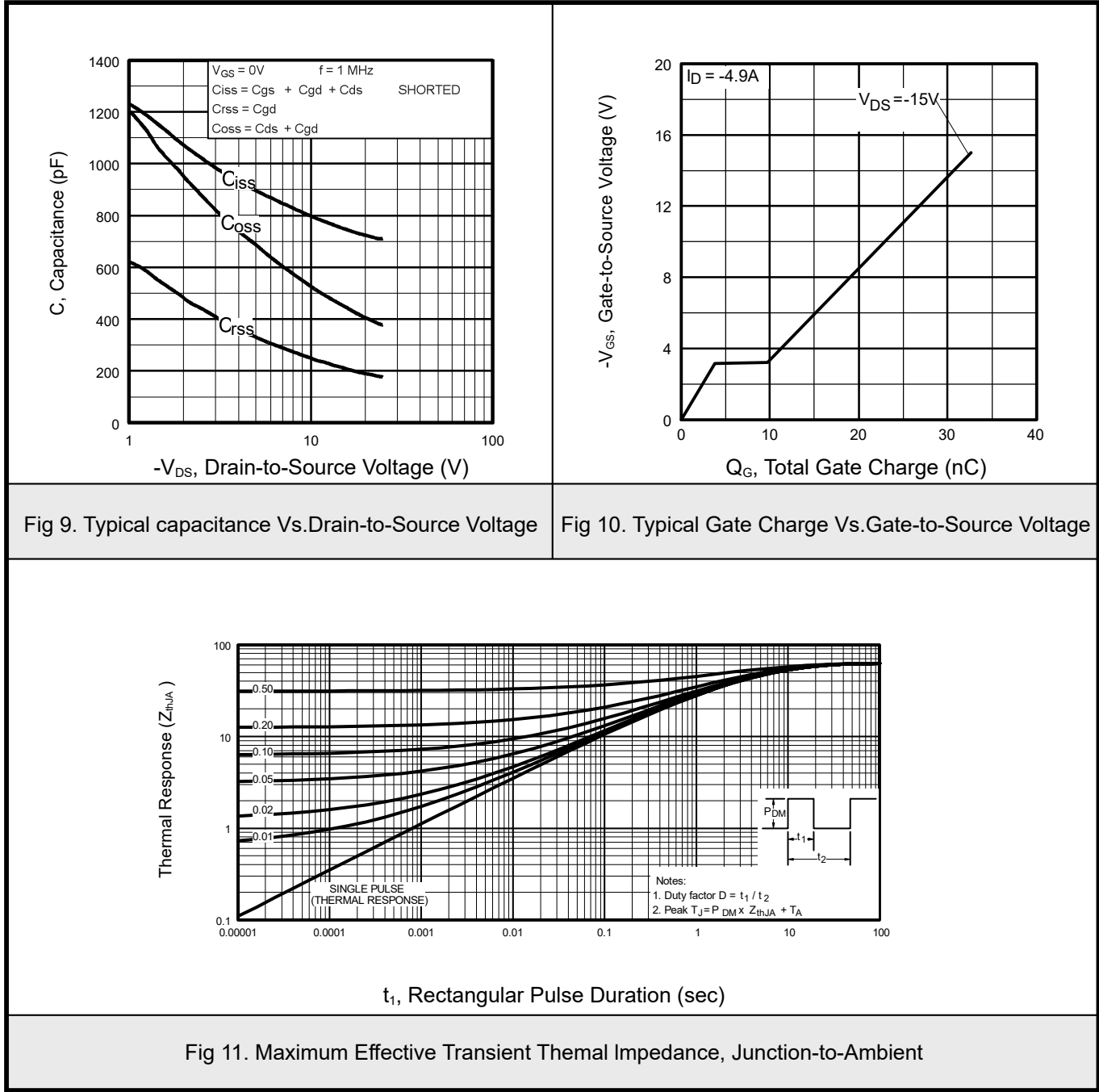


7.2Typical Characterisitics



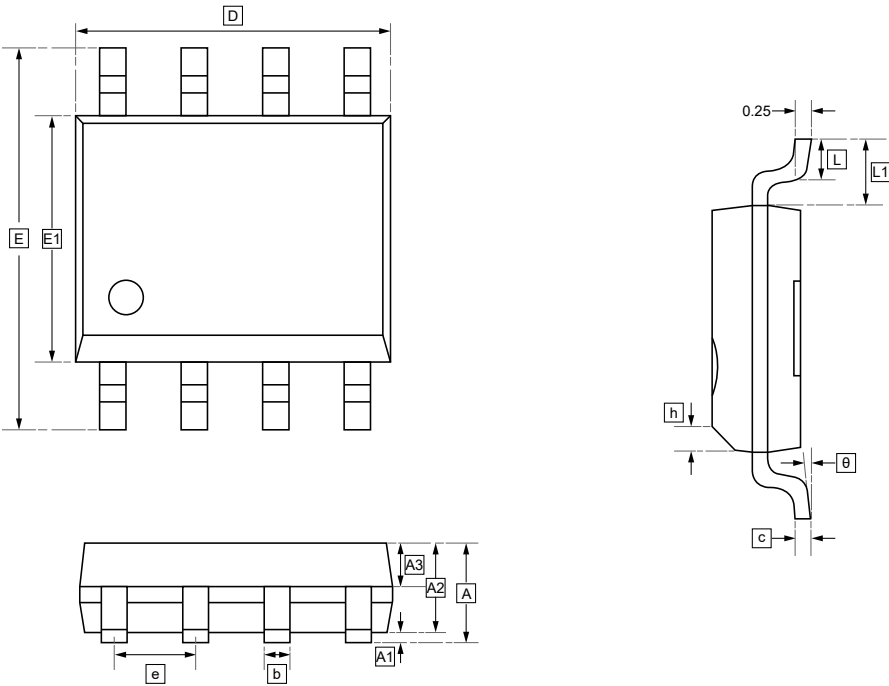


7.3Typical Characteristics





8.SOP-8 Package Outline Dimensions



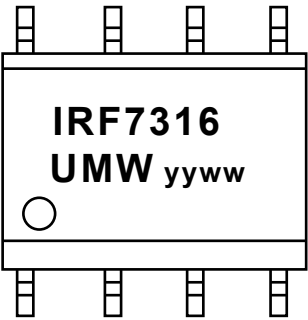
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	b	c	D	E	E1	e	h	L
Min	-	0.05	1.30	0.60	0.39	0.20	4.80	5.80	3.80	1.24	0.30	0.50
Max	1.75	0.20	1.50	0.70	0.47	0.24	5.00	6.20	4.00	1.30	0.50	0.80

Symbol	L1	θ
Min	1.00	0°
Max	1.10	8°



9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRF7316TR	SOP-8	3000	Tape and reel



10.Disclaimer

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