

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.

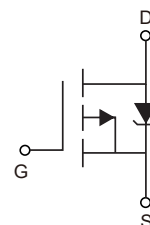
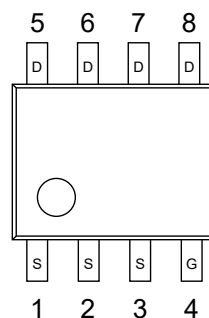
2.Features

- $V_{DS} = -30V$
- $R_{DS(ON)} < 13.5m\Omega (V_{GS} = -10V, I_D = -11A)$
- $R_{DS(ON)} < 22m\Omega (V_{GS} = -4.5V, I_D = -8.8A)$

3.Pinning information

Pin	Symbol	Description
1,2,3	S	SOURCE
4	G	GATE
5,6,7,8	D	DRAIN

SOP-8



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

Parameter		Symbol	Rating	Units
Drain- Source Voltage		V_{DS}	-30	V
Continuous Drain Current, $V_{GS} = -10V$	$T_A = 25^\circ C$	I_D	-11	A
Continuous Drain Current, $V_{GS} = -10V$	$T_A = 70^\circ C$		-9.3	A
Pulsed Drain Current ①		I_{DM}	-47	A
Power Dissipation ③	$T_A = 25^\circ C$	P_D	2.5	W
Power Dissipation ③	$T_A = 70^\circ C$		1.6	W
Linear Derating Factor			20	mW/ $^\circ C$
Gate-to-Source Voltage		V_{GS}	± 20	V
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$



5.Thermal Resistance Rating

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ③	$R_{\theta JA}$		50	°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		-0.019		V/ $^{\circ}\text{C}$
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10\text{V}$, $I_D=-11\text{A}$ ②			13.5	m Ω
		$V_{GS}=-4.5\text{V}$, $I_D=-8.8\text{A}$ ②			22	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-1		-2.5	V
Forward Transconductance	g_{FS}	$V_{DS}=-10\text{V}$, $I_D=-11\text{A}$	17			S
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=-24\text{V}$, $V_{GS}=0\text{V}$			-15	μA
		$V_{DS}=-24\text{V}$, $V_{GS}=0\text{V}$, $T_J=70^{\circ}\text{C}$			-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	$I_D=-11\text{A}$		75	110	nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=-15\text{V}$		14	21	
Gate-to-Drain ("Miller") Charge	Q_{gd}	$V_{GS}=-10\text{V}$		12	18	
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=-15\text{V}$ ②		15		ns
Rise Time	t_r	$I_D=-1\text{A}$		23		ns
Turn-Off Delay Time	$t_{D(off)}$	$R_G=6\Omega$		150		ns
Fall Time	t_f	$V_{GS}=-10\text{V}$		76		ns
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$		4030		pF
Output Capacitance	C_{oss}	$V_{DS}=-25\text{V}$		580		pF
Reverse Transfer Capacitance	C_{rss}	$f=1.0\text{kHz}$		410		pF



7.Source-Drain Ratings and Characteristics

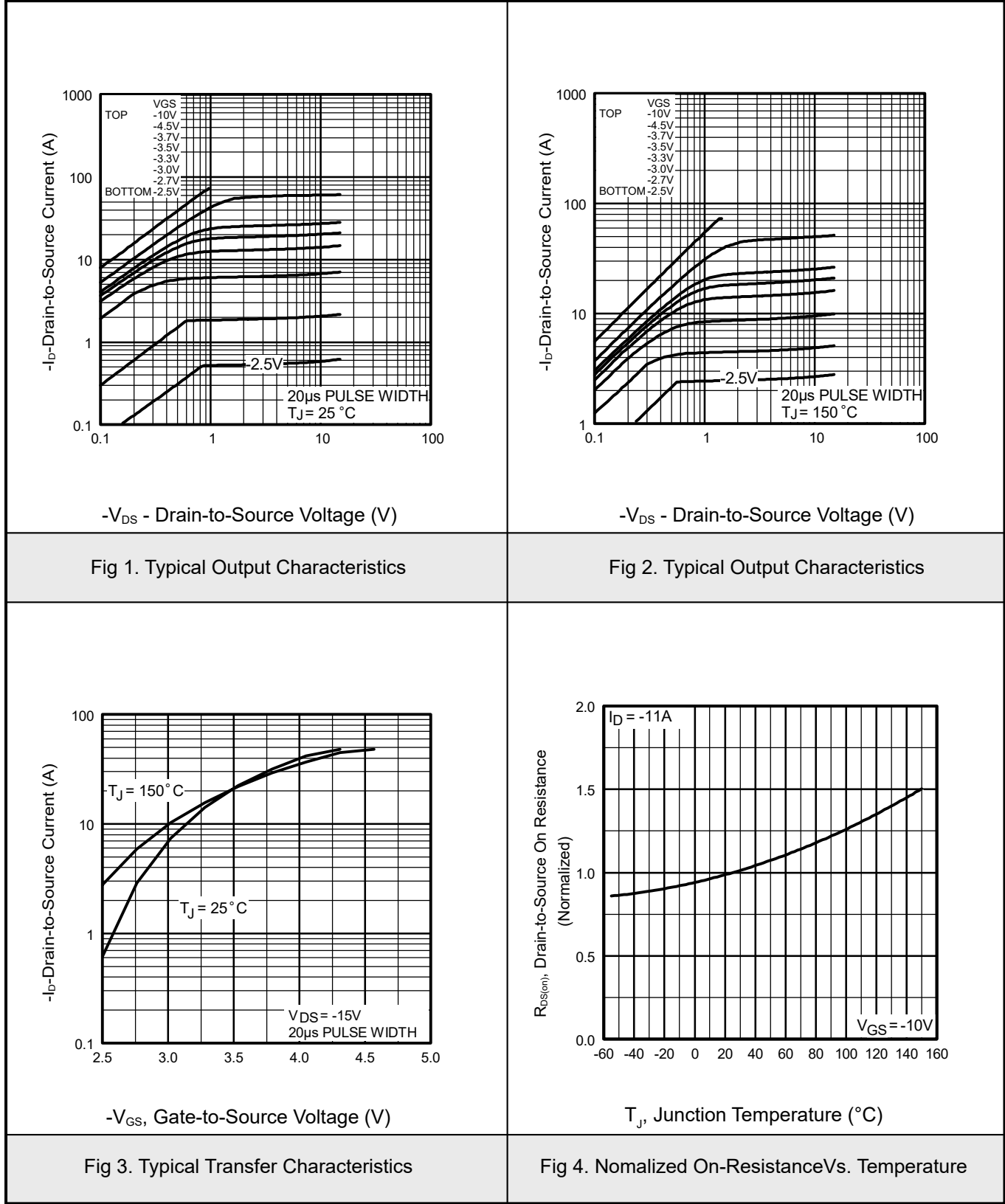
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			-2.5	A
Pulsed Source Current (Body Diode) ①	I_{SM}				-47	
Diode Forward Voltage	V_{SD}	$T_J=25^{\circ}C, I_S=-2.5A, V_{GS}=0V$ ②			-1.2	V
Reverse Recovery Time	t_{rr}			40	60	ns
Reverse Recovery Charge	Q_{rr}			47	71	nC

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Pulse width $\leq 400\mu s$; duty cycle $\leq 2\%$.
- ③ Surface mounted on 1 in square Cu board.

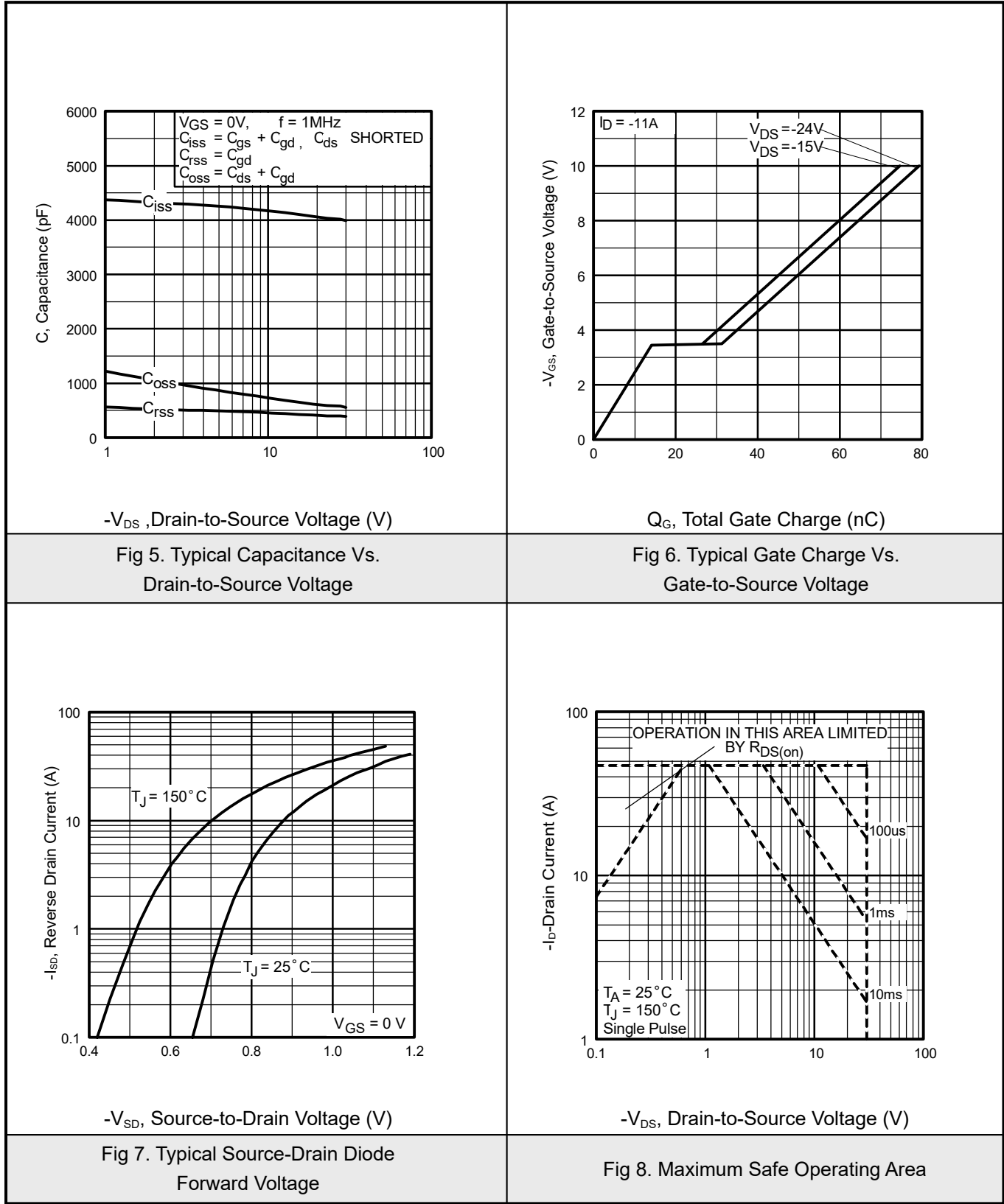


8.1Typical Characteristics



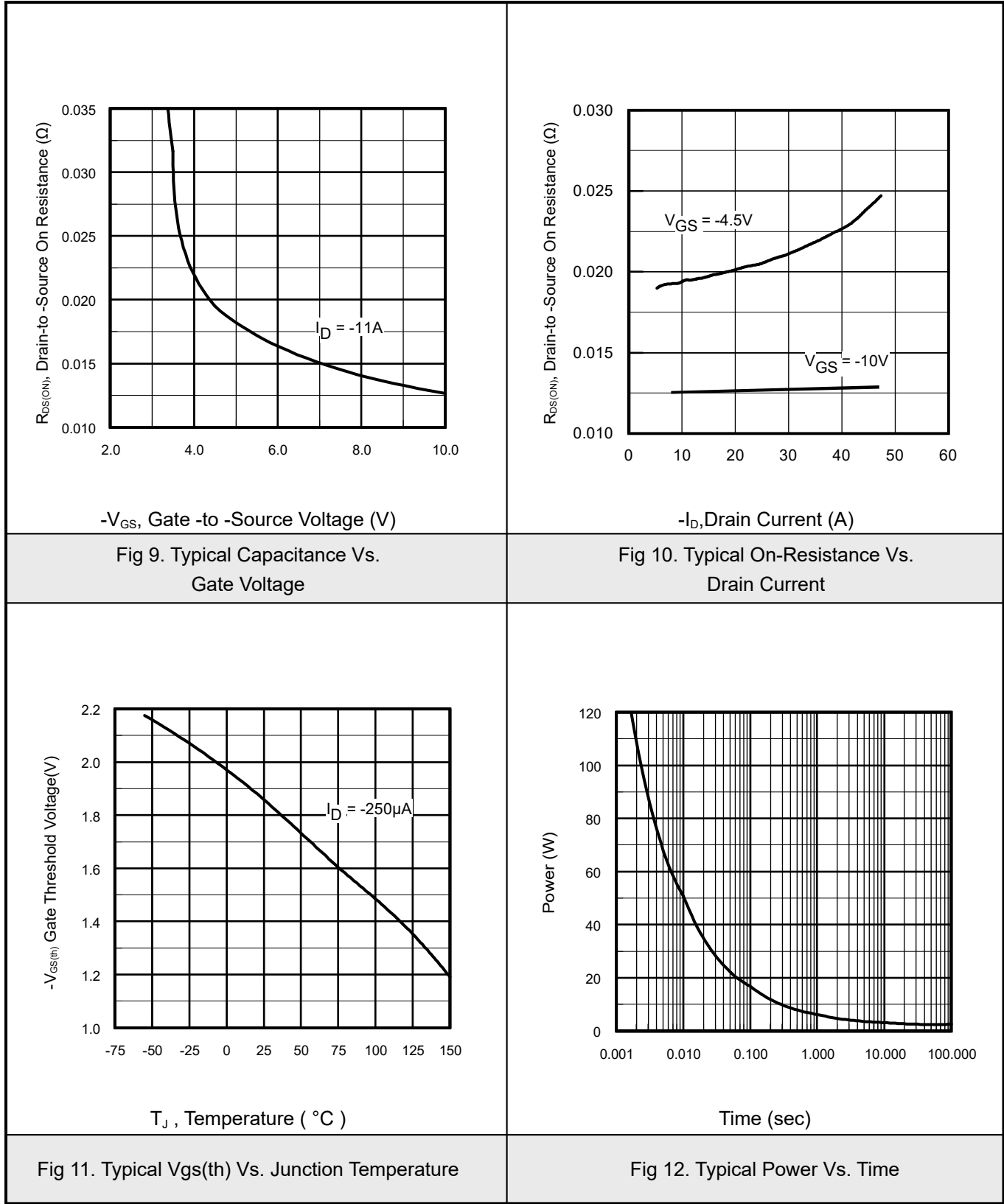


8.2Typical Characteristics





8.3Typical Characterisitics





8.4Typical Characterisitics

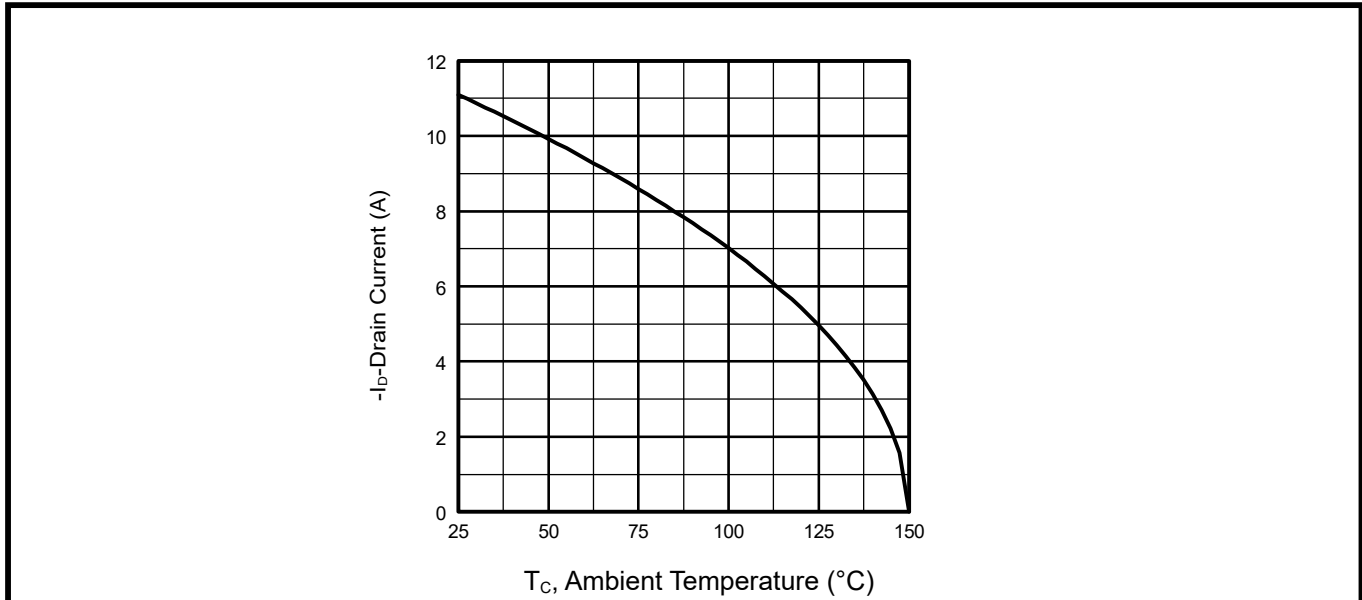


Fig 13. Maximum Drain Current Vs.AmbientTemperature

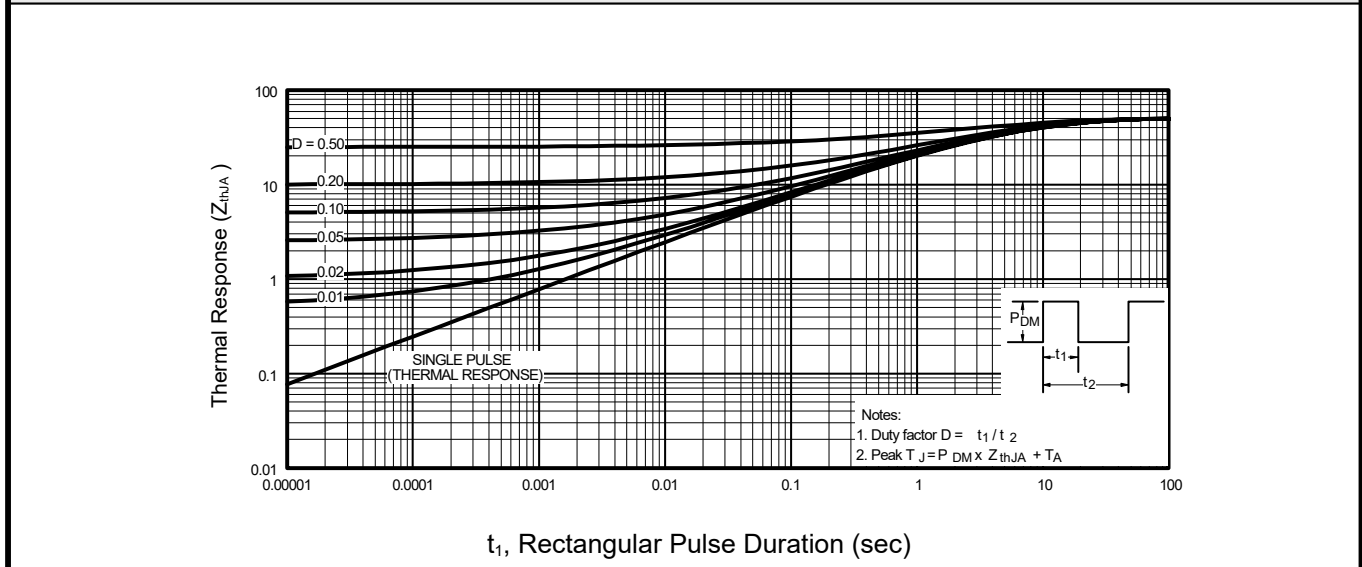


Fig 14. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



8.5 Typical Characteristics

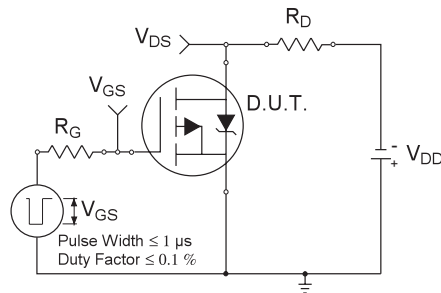


Fig 15a. Switching Time Test Circuit

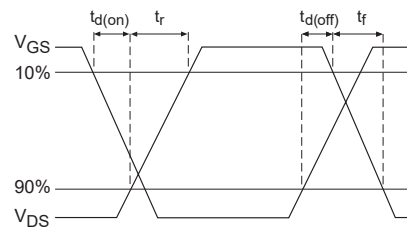


Fig 15b. Switching Time Waveforms

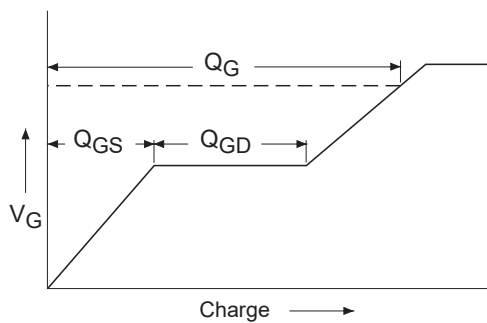


Fig 16a. Basic Gate Charge Waveform

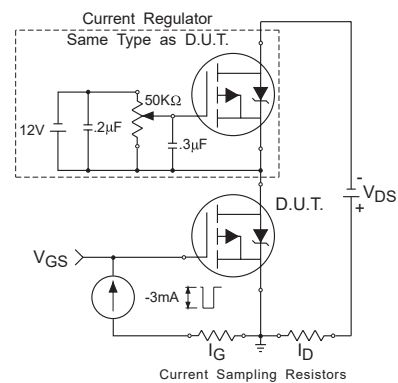
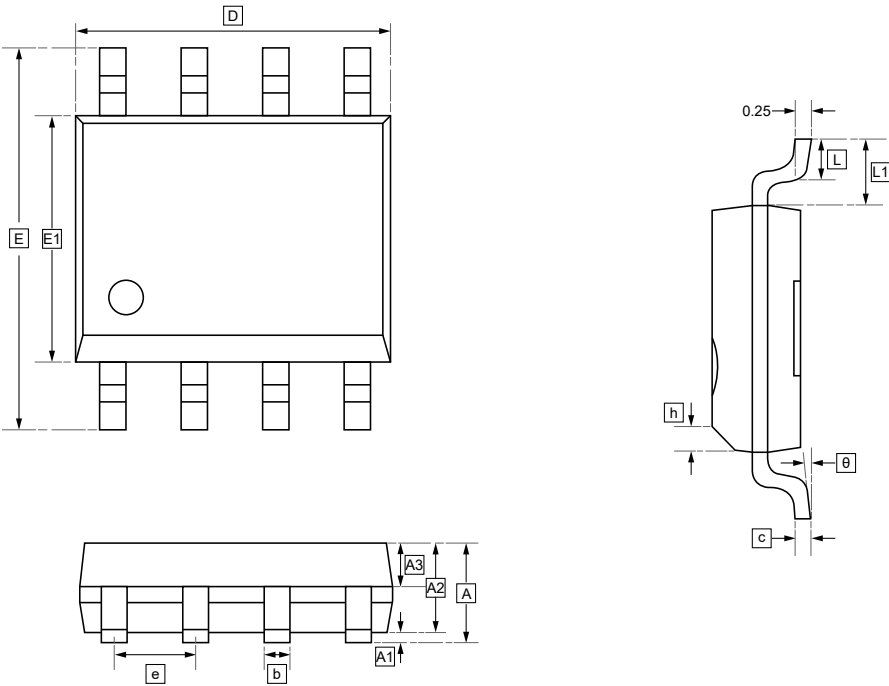


Fig 16b. Gate Charge Test Circuit



9.SOP-8 Package Outline Dimensions



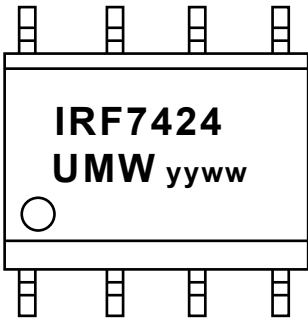
DIMENSIONS (mm are the original dimensions)

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°



10.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRF7424TR	SOP-8	3000	Tape and reel



11.Disclaimer

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