

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, infra red, or wave soldering techniques. Power dissipation of greater than 0.8W is possible in a typical PCB mount application.

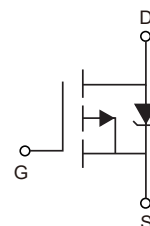
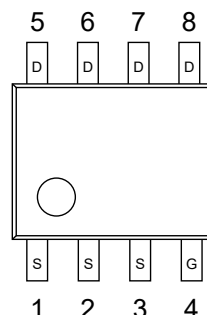
2.Features

- Generation V Technology
- Ultra Low On-Resistance
- P-Channel Mosfet
- Surface Mount
- Available in Tape & Reel
- Dynamic dv/dt Rating
- Fast Switching
- Lead-Free

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

Parameter		Symbol	Rating	Units
10 Sec. Pulsed Drain Current, $V_{GS} = -10V$	$T_A = 25^\circ C$	I_D	-6.7	A
Continuous Drain Current, $V_{GS} = -10V$	$T_A = 25^\circ C$		-5.8	A
Continuous Drain Current, $V_{GS} = -10V$	$T_A = 70^\circ C$		-3.7	A
Pulsed Drain Current ①		I_{DM}	-23	A
Power Dissipation	$T_A = 25^\circ C$	P_D	2.5	W
Linear Derating Factor			0.02	W/ $^\circ C$
Gate-to-Source Voltage		V_{GS}	± 20	V
Peak Diode Recovery dv/dt ②		dv/dt	-5	V/ns
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 ④	R _{θJA}		50	°C/W



6. Electrical Characteristic (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V _{(BR)DSS}	I _D =-250μA, V _{GS} =0V	-30			V
Breakdown Voltage Temp. Coefficient	ΔV _{(BR)DSS} /ΔT _J	I _D =-1mA, Reference to 25°C		-0.02		V/°C
Static Drain-to-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-2.8A ③			45	mΩ
		V _{GS} =-4.5V, I _D =-2.4A ③			70	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1			V
Forward Transconductance	g _{FS}	V _{DS} =-15V, I _D =-2.8A	3.1			S
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =-24V, V _{GS} =0V			-1	μA
		V _{DS} =-24V, V _{GS} =0V, T _J =125°C			-25	
Gate-to-Source Forward Leakage	I _{GSS}	V _{GS} =-20V			-100	nA
Gate-to-Source Reverse Leakage		V _{GS} =20V			100	
Total Gate Charge	Q _g	I _D =-2.8A			59	nC
Gate-to-Source Charge	Q _{gs}	V _{DS} =-2.4V, V _{GS} =-10V			5.7	
Gate-to-Drain ("Miller") Charge	Q _{gd}	See Fig. 6 and 12 ③			21	
Turn-On Delay Time	t _{D(on)}	V _{DD} =-15V		16		ns
Rise Time	t _r	I _D =-2.8A		33		ns
Turn-Off Delay Time	t _{D(off)}	R _G =6Ω		45		ns
Fall Time	t _f	R _D =5.3Ω, See Fig. 10 ③		47		ns
Internal Drain Inductance	L _D	Between lead tip and center of die contact		2.5		nH
Internal Source inductance	L _S			4		
Input Capacitance	C _{iss}	V _{GS} =0V		1100		pF
Output Capacitance	C _{oss}	V _{DS} =-25V		490		pF
Reverse Transfer Capacitance	C _{rss}	f=1.0MHz, See Fig.5		220		pF



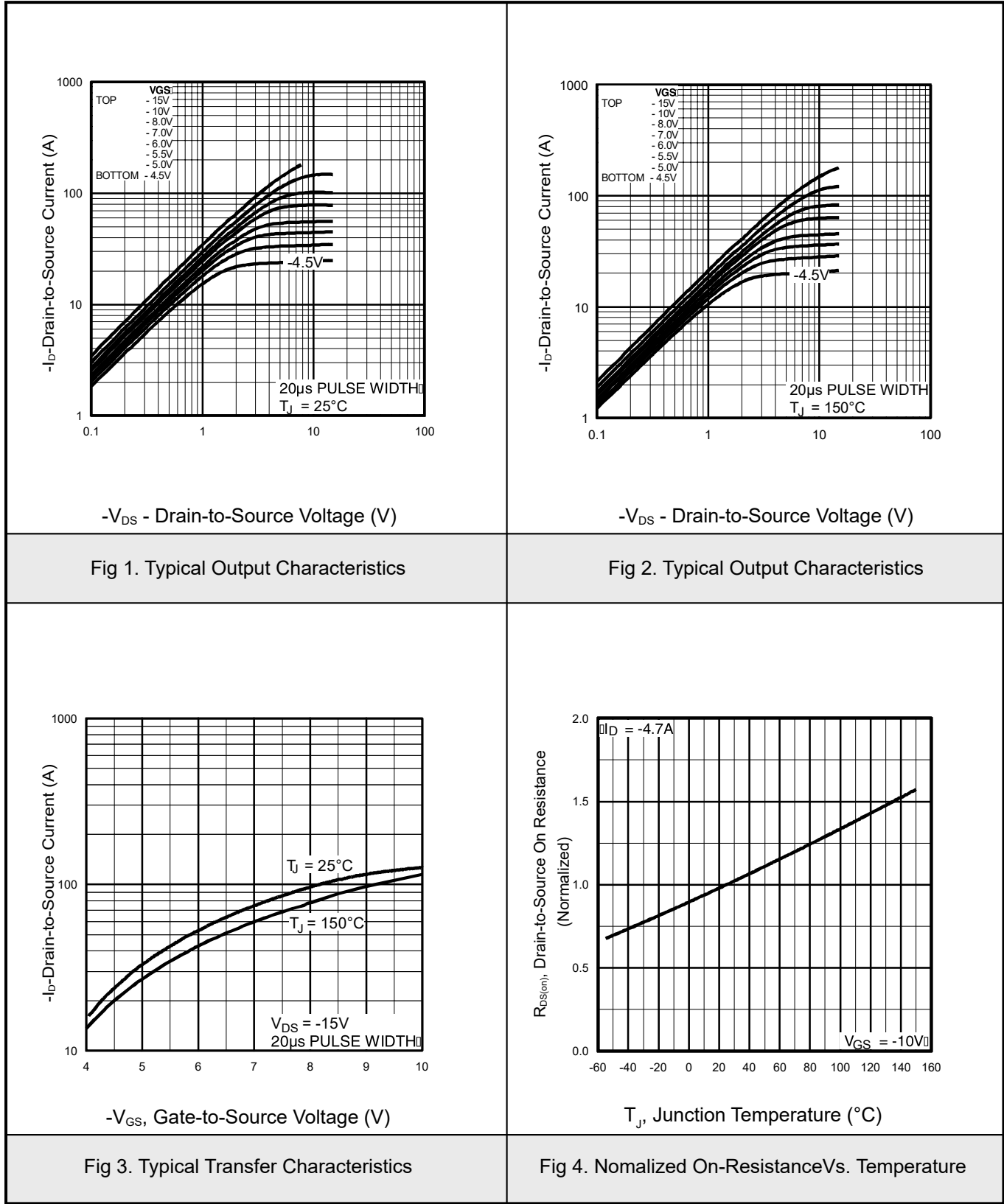
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			-3.1	A
Pulsed Source Current (Body Diode) ①	I_{SM}				-23	
Diode Forward Voltage	V_{SD}	$T_J=25^\circ\text{C}, I_S=-2\text{A}, V_{GS}=0\text{V}$ ③			-1	V
Reverse Recovery Time	t_{rr}	$T_J=25^\circ\text{C}, I_F=-2.8\text{A}$		42	63	ns
Reverse Recovery Charge	Q_{rr}	$di/dt=100\text{A}/\mu\text{s}$ ③		64	96	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Notes:

- ① Repetitive rating; pulse width limited by max.junction temperature.(See fig.11)
- ② $I_{SD} \leq -2.8\text{A}$, $di/dt \leq 90\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ\text{C}$.
- ③ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ Surface mounted on FR-4 board, $t \leq 10\text{sec}$.

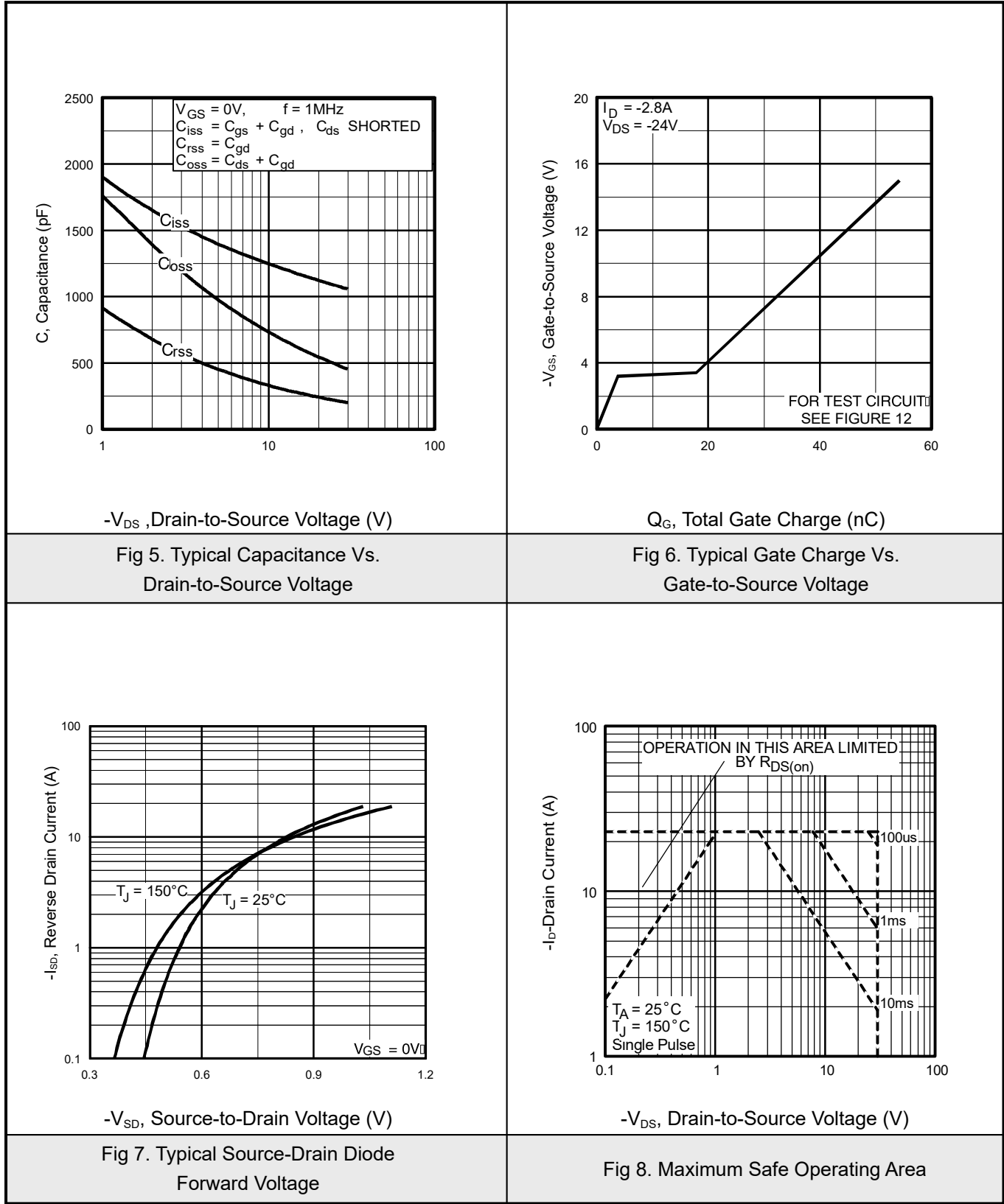


7.1Typical Characterisitics





7.2Typical Characteristics





7.3 Typical Characteristics

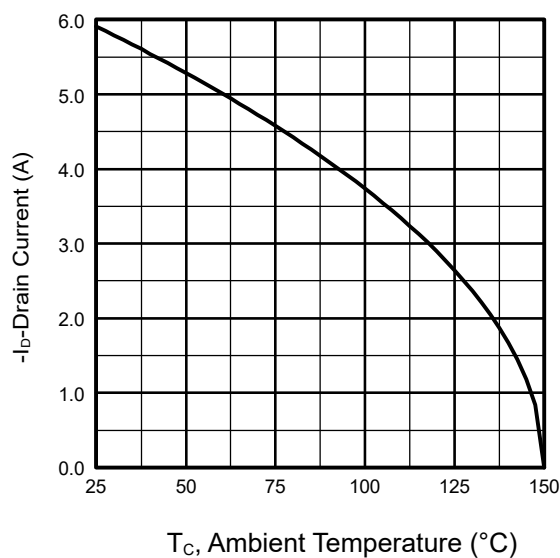


Fig 9. Maximum Drain Current Vs. Ambient Temperature

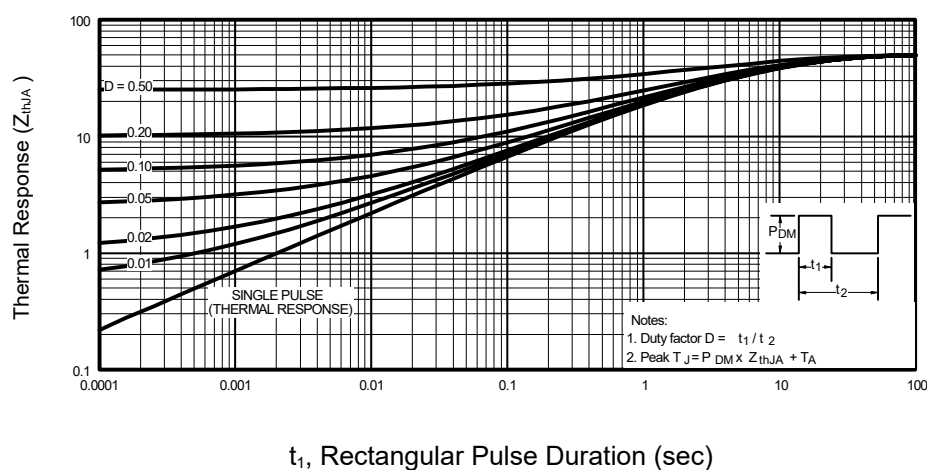


Fig 10. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



7.4 Typical Characteristics

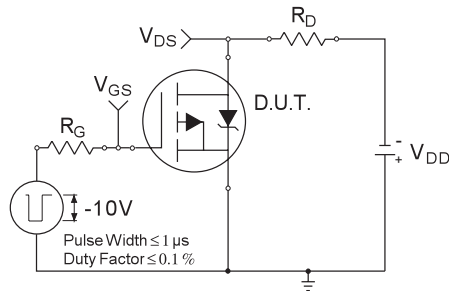


Fig 11a. Switching Time Test Circuit

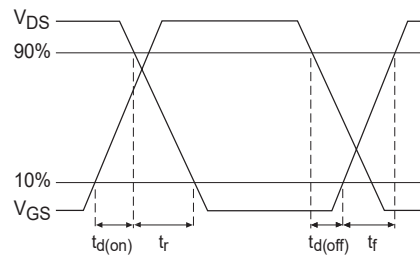


Fig 11b. Switching Time Waveforms

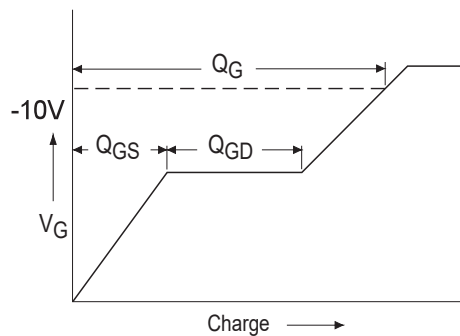


Fig 12a. Basic Gate Charge Waveform

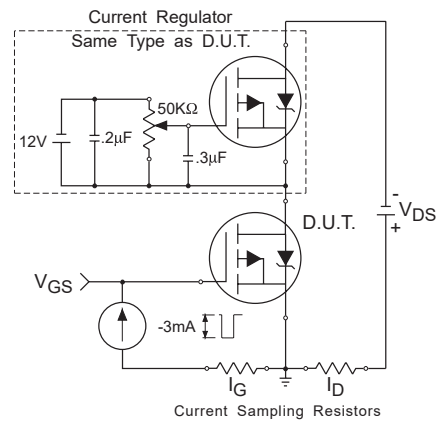
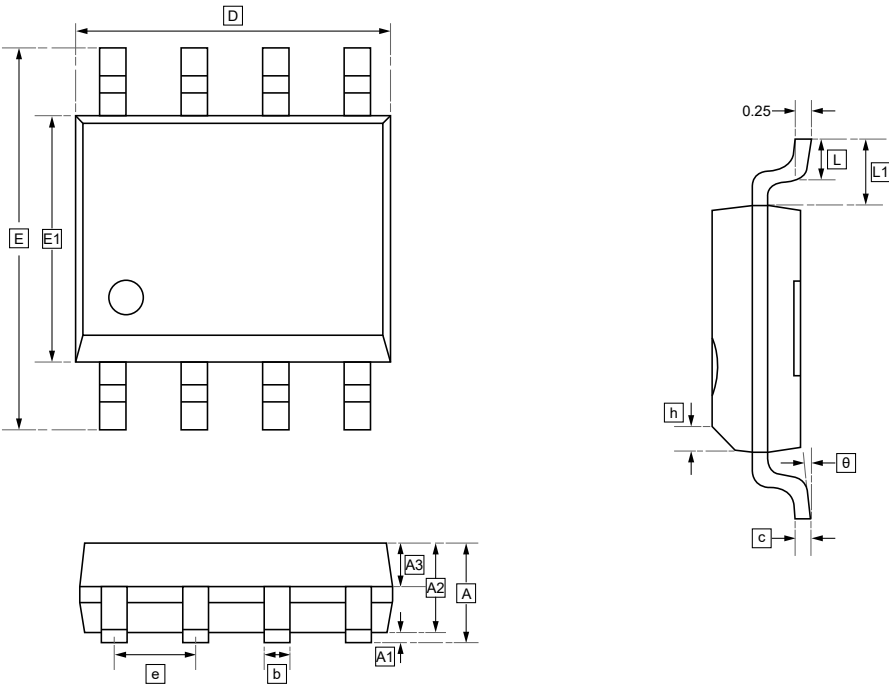


Fig 12b. Gate Charge Test Circuit



8.SOP-8 Package Outline Dimensions



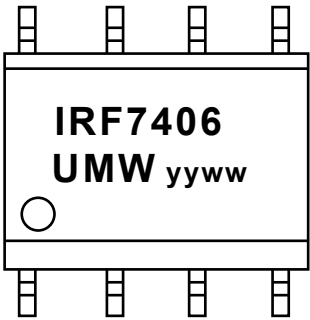
DIMENSIONS (mm are the original dimensions)

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 IRF7406TR	SOP-8	3000	Tape and reel



10.Disclaimer

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