

## 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.

## 2.2 Features

- Generation V Technology
- Ultra Low On-Resistance
- Surface Mount

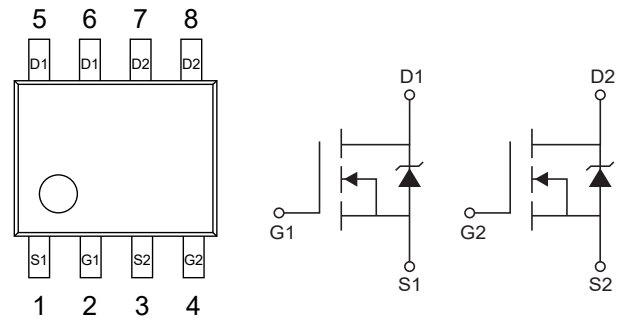
## 2.1 Features

- $V_{DS(V)}=30V$
- $I_D=5.3A$
- $R_{DS(ON)}<50m\Omega(V_{GS}=-10)$
- $R_{DS(ON)}<80m\Omega(V_{GS}=-4.5V)$

## 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 $T_A=25^\circ C$ unless otherwise noted

Parameter		Symbol	Rating	Units
10 Sec. Pulsed Drain Current, $V_{GS}=10V$	$T_A=25^\circ C$	$I_D$	5.3	A
Continuous Drain Current, $V_{GS}=10V$	$T_A=25^\circ C$		4.9	A
Continuous Drain Current, $V_{GS}=10V$	$T_A=70^\circ C$		3.9	A
Pulsed Drain Current ①		$I_{DM}$	20	A
Power Dissipation	$T_A=25^\circ C$	$P_D$	2	W
Linear Derating Factor			0.016	W/ $^\circ C$



Gate-to-Source Voltage	$V_{GS}$	$\pm 20$	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	$R_{\theta JA}$		62.5	$^{\circ}C/W$



## 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 $25^\circ\text{C}$		0.032		$\text{V}/^\circ\text{C}$
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=2.4\text{A}$ ③			50	m $\Omega$
		$V_{GS}=4.5\text{V}$ , $I_D=2\text{A}$ ③			80	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	1			V
Forward Transconductance	$g_{FS}$	$V_{DS}=15\text{V}$ , $I_D=2.4\text{A}$	5.2			S
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{DS}=24\text{V}$ , $V_{GS}=0\text{V}$			1	$\mu\text{A}$
		$V_{DS}=24\text{V}$ , $V_{GS}=0\text{V}$ , $T_J=125^\circ\text{C}$			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	$Q_g$	$I_D=2.4\text{A}$			25	nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=24\text{V}$ , $V_{GS}=10\text{V}$			2.9	
Gate-to-Drain ("Miller") Charge	$Q_{gd}$	See Fig. 6 and 12 ③			7.9	
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=15\text{V}$		6.8		ns
Rise Time	$t_r$	$I_D=2.4\text{A}$		21		ns
Turn-Off Delay Time	$t_{D(off)}$	$R_G=6\Omega$		22		ns
Fall Time	$t_f$	$R_D=6.2\Omega$ , See Fig. 10 ③		7.7		ns
Internal Drain inductance	$L_D$	Between lead tip and center of die contact		4		nH
Internal Source inductance	$L_S$			6		
Input Capacitance	$C_{iss}$	$V_{GS}=0\text{V}$		520		pF
Output Capacitance	$C_{oss}$	$V_{DS}=25\text{V}$		180		pF
Reverse Transfer Capacitance	$C_{rss}$	$f=1.0\text{MHz}$ , See Fig. 5		72		pF



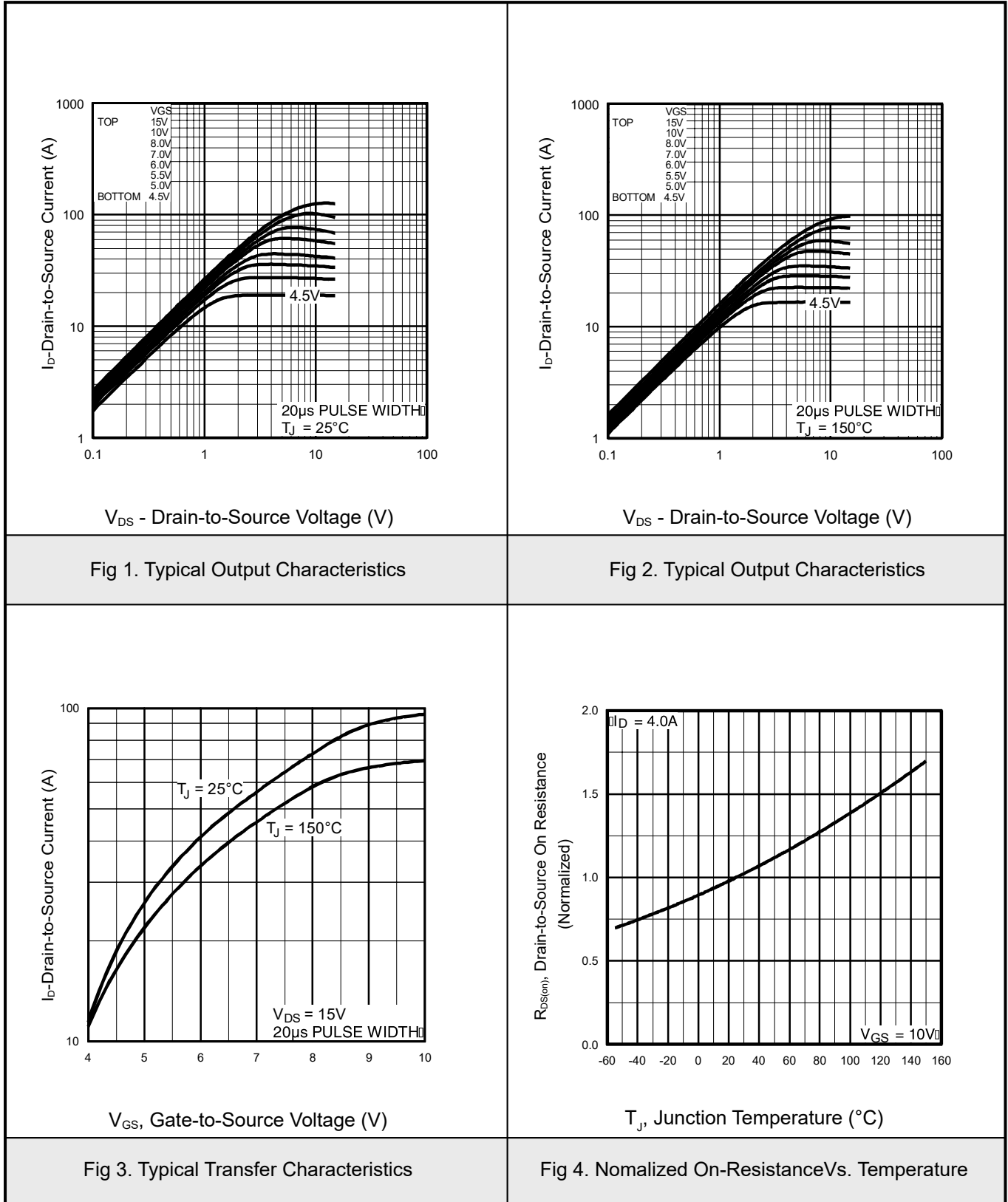
Source-Drain Ratings and Characteristics							
Continuous Source Current (Body Diode)	$I_S$	MOSFET symbol showing the integral reverse p-n junction diode.			2.5	A	
Pulsed Source Current (Body Diode) ①	$I_{SM}$				20		
Diode Forward Voltage	$V_{SD}$	$T_J=25^\circ\text{C}, I_S=1.8\text{A}, V_{GS}=0\text{V}$ ③			1	V	
Reverse Recovery Time	$t_{rr}$		$T_J=25^\circ\text{C}, I_F=2.4\text{A}$		47	71	ns
Reverse Recovery Charge	$Q_{rr}$		$di/dt=100\text{A}/\mu\text{s}$ ③		56	84	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  $I_{SD} \leq 2.4\text{A}$ ,  $di/dt \leq 73\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J \leq 150^\circ\text{C}$ .
- ③ Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .
- ④ Surface mounted on FR-4 board,  $t \leq 10\text{sec}$ .

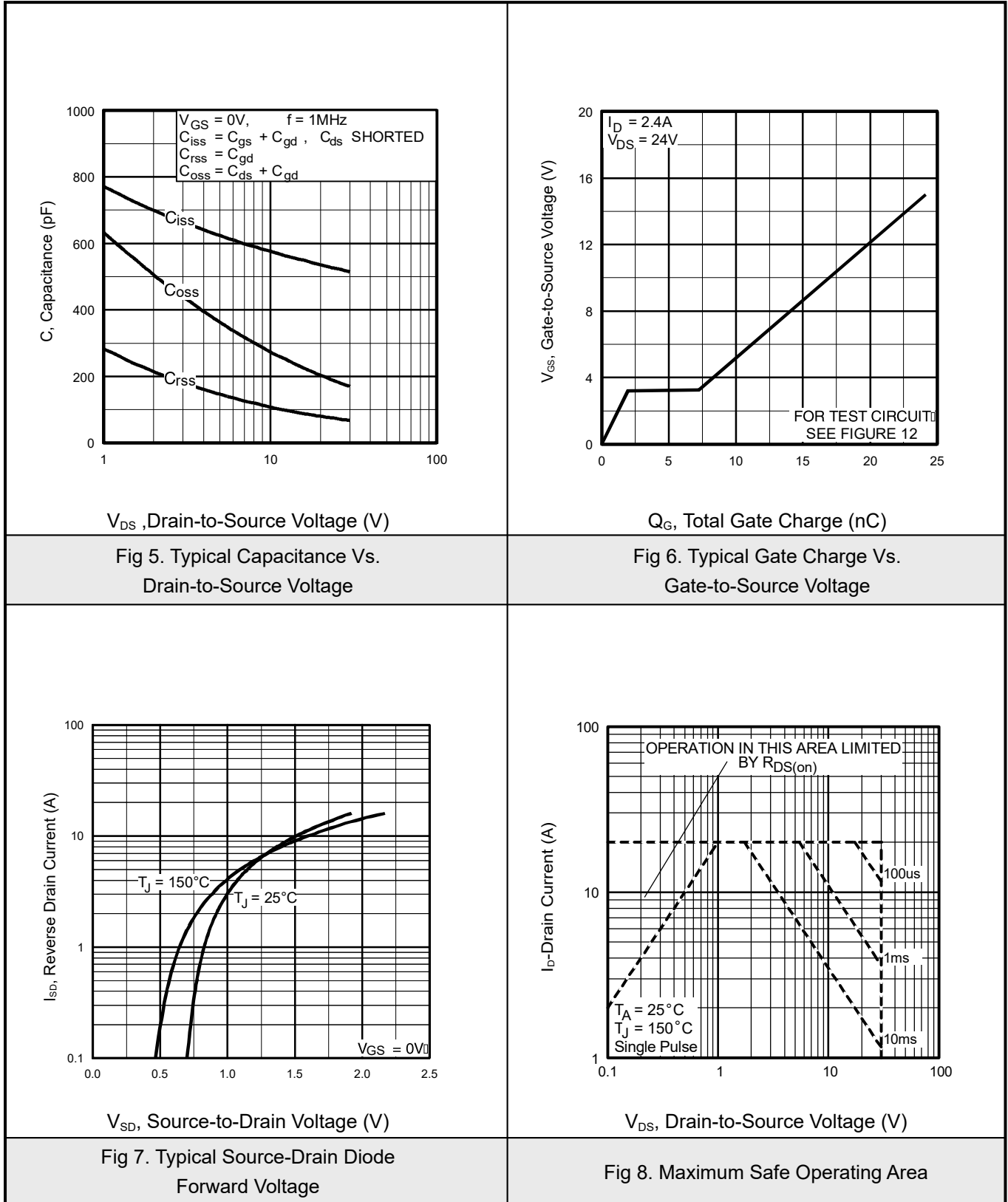


## 7.1 Typical Characteristics





## 7.2 Typical Characteristics





## 7.3 Typical Characteristics

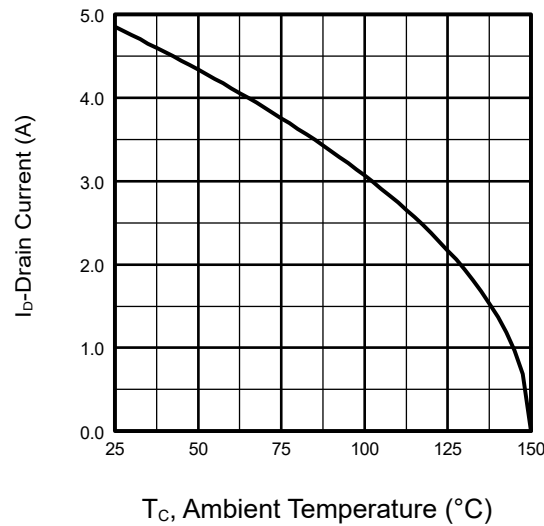


Fig 9. Maximum Drain Current Vs.AmbientTemperature

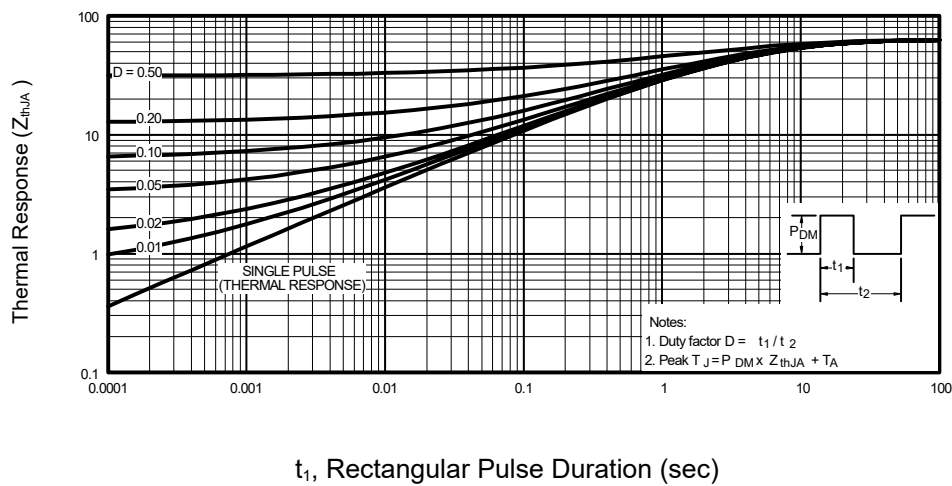


Fig 10. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

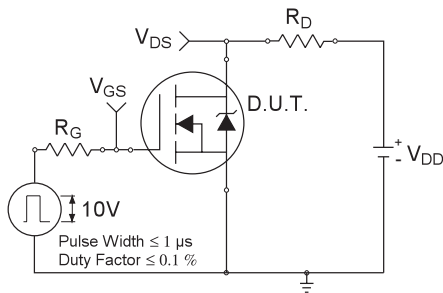


Fig 11a. Switching Time Test Circuit

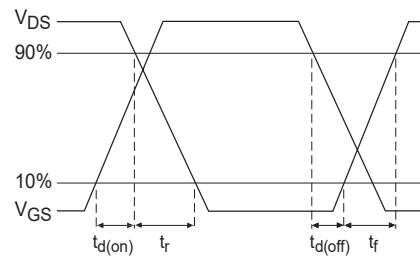


Fig 11b. Switching Time Waveforms

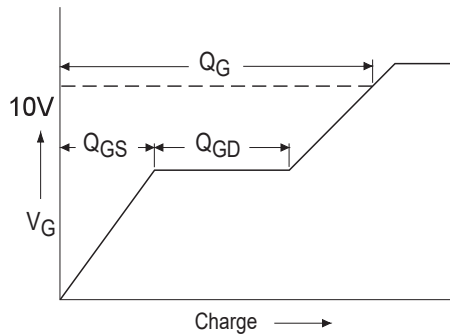


Fig 12a. Basic Gate Charge Waveform

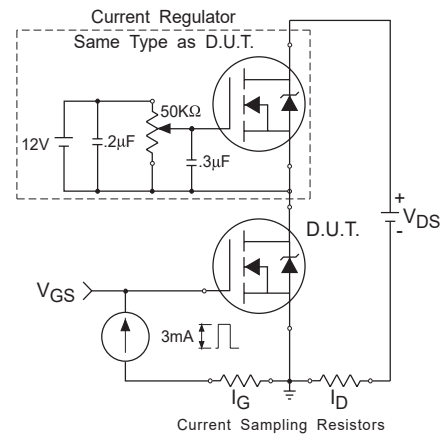
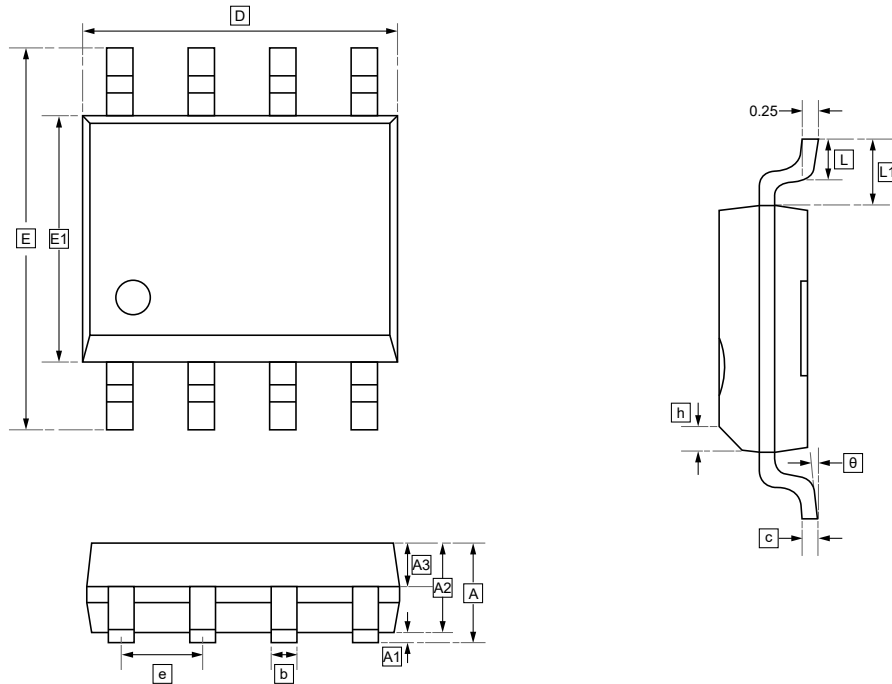


Fig 12b. Gate Charge Test Circuit



## 8.SOP-8 Package Outline Dimensions



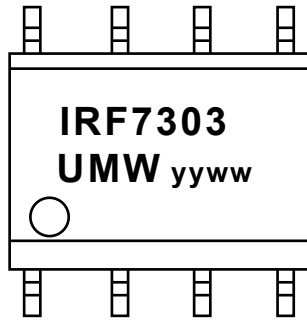
### DIMENSIONS (mm are the original dimensions)

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 IRF7303TR	SOP-8	3000	Tape and reel



## 10.Disclaimer

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