

1.Applications

- Synchronous MOSFET for Notebook Processor Power
- Synchronous Rectifier MOSFET for Isolated DC-DC Converters in Networking Systems

3.Benefits

- Very Low $R_{DS(ON)}$ at 4.5V V_{GS}
- Low Gate Charge

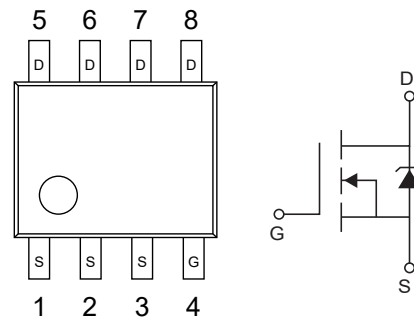
2.Features

- $V_{DS(V)}=30V$
- $I_D=17.2A(V_{GS}=10V)$
- $R_{DS(ON)}<5.6m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<6.8m\Omega(V_{GS}=4.5V)$

4.Pinning information

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

SOP-8



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

Parameter		Symbol	Rating	Units
Drain- Source Voltage		V_{DS}	30	V
Gate-to-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current, $V_{GS}=10V$	$T_A=25^{\circ}C$	I_D	17.2	A
Continuous Drain Current, $V_{GS}=10V$	$T_A=70^{\circ}C$		13.8	A
Pulsed Drain Current ①		I_{DM}	135	A
Power Dissipation ④	$T_A=25^{\circ}C$	P_D	2.5	W
Power Dissipation ④	$T_A=70^{\circ}C$		1.6	W
Linear Derating Factor			0.02	W/ $^{\circ}C$
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^{\circ}C$



6.Thermal resist ance rating

Parameter	Symbol	Typ	Max	Units
Junction-to-Drain Lead ⑤	$R_{\theta JL}$		20	°C/W
Junction-to-Ambient ④ ⑤	$R_{\theta JA}$		50	°C/W



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

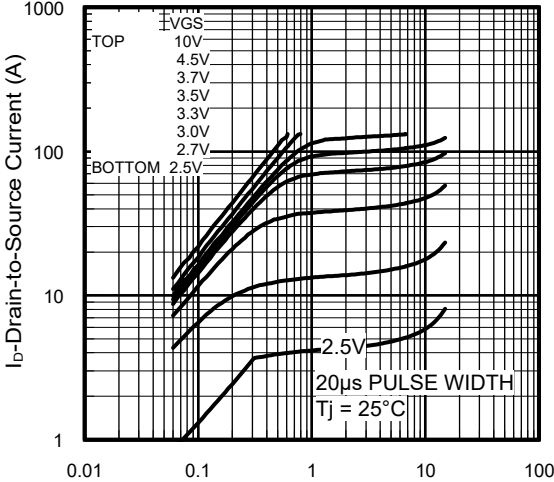
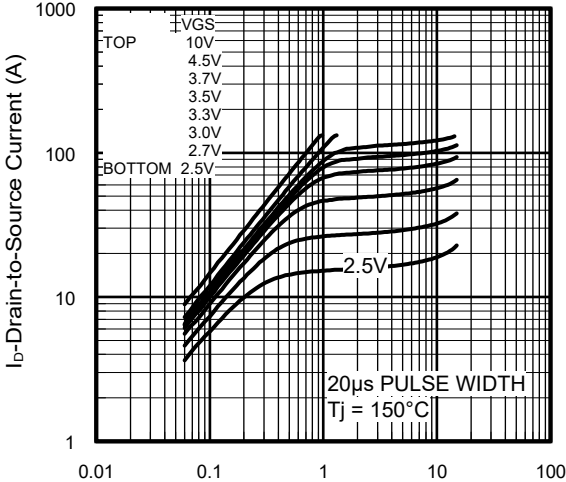
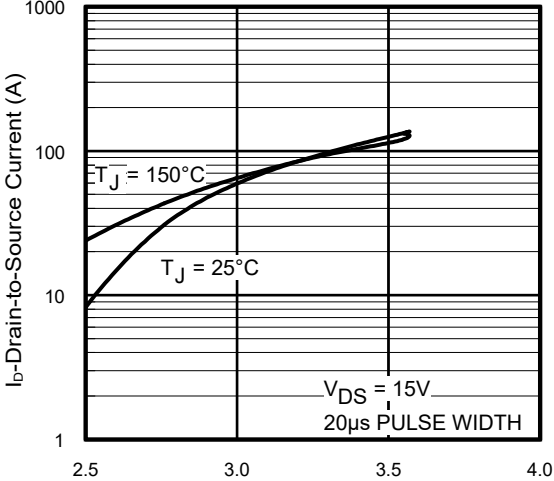
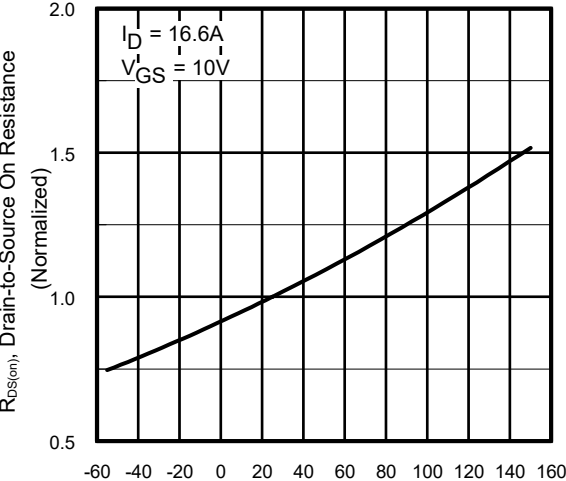
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	30			V
Breakdown Voltage Temp. Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=1\text{mA}$, Reference to 25°C		0.024		V/ $^\circ\text{C}$
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=17.2\text{A}$ ③		4.7	5.6	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=13.8\text{A}$ ③		5.8	6.8	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.5		2.2	V
Gate Threshold Voltage Coefficient	$\Delta V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$		-5.4		mV/ $^\circ\text{C}$
Drain-to-Source Leakage Current	I_{DSS}	$V_{DS}=24\text{V}$, $V_{GS}=0\text{V}$			1	μA
		$V_{DS}=24\text{V}$, $V_{GS}=0\text{V}$, $T_J=125^\circ\text{C}$			150	μA
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	nA
Forward Transconductance	g_{FS}	$V_{DS}=15\text{V}$, $I_D=13.3\text{A}$	73			S
Total Gate Charge	Q_g	$V_{DS}=15\text{V}$ $V_{GS}=4.5\text{V}$ $I_D=13.3\text{A}$ See Fig. 16		24		nC
Pre-Vth Gate-to-Source Charge	Q_{gs1}			6.2		nC
Post-Vth Gate-to-Source Charge	Q_{gs2}			2		nC
Gate-to-Drain Charge	Q_{gd}			8.5		nC
Gate Charge Overdrive	Q_{godr}			7.3		nC
Switch Charge ($Q_{gs2} + Q_{gd}$)	Q_{sw}			10.5		nC
Output Charge	Q_{oss}	$V_{GS}=0\text{V}$, $V_{DS}=10\text{V}$		10		nC
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=15\text{V}$		13		ns
Rise Time	t_r	$V_{GS}=4.5\text{V}$ ③		8.9		ns
Turn-Off Delay Time	$t_{D(off)}$	$I_D=13.3\text{A}$		17		ns
Fall Time	t_f	Clamped Inductive Load		3.5		ns
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$		2910		pF
Output Capacitance	C_{oss}	$V_{DS}=15\text{V}$		600		pF
Reverse Transfer Capacitance	C_{rss}	$f=1.0\text{MHz}$		250		pF



Avalanche Characteristics						
Single Pulse Avalanche Energy ②	E _{AS}				48	mJ
Avalanche Current ①	I _{AR}				13.3	A
Diode Characteristics						
Continuous Source Current	I _S	MOSFET symbol showing the integral reverse p-n junction diode.			3.1	A
(Body Diode)						A
Pulsed Source Current	I _{SM}				135	
(Body Diode) ①						
Diode Forward Voltage	V _{SD}	T _J =25°C,I _S =13.3A,V _{GS} =0V ③			1	V
Reverse Recovery Time	t _{rr}	T _J =25°C,I _F =13.3A, V _{DD} =10V dI/dt=100A/μs ③		34	51	ns
Reverse Recovery Charge	Q _{rr}			21	32	nC

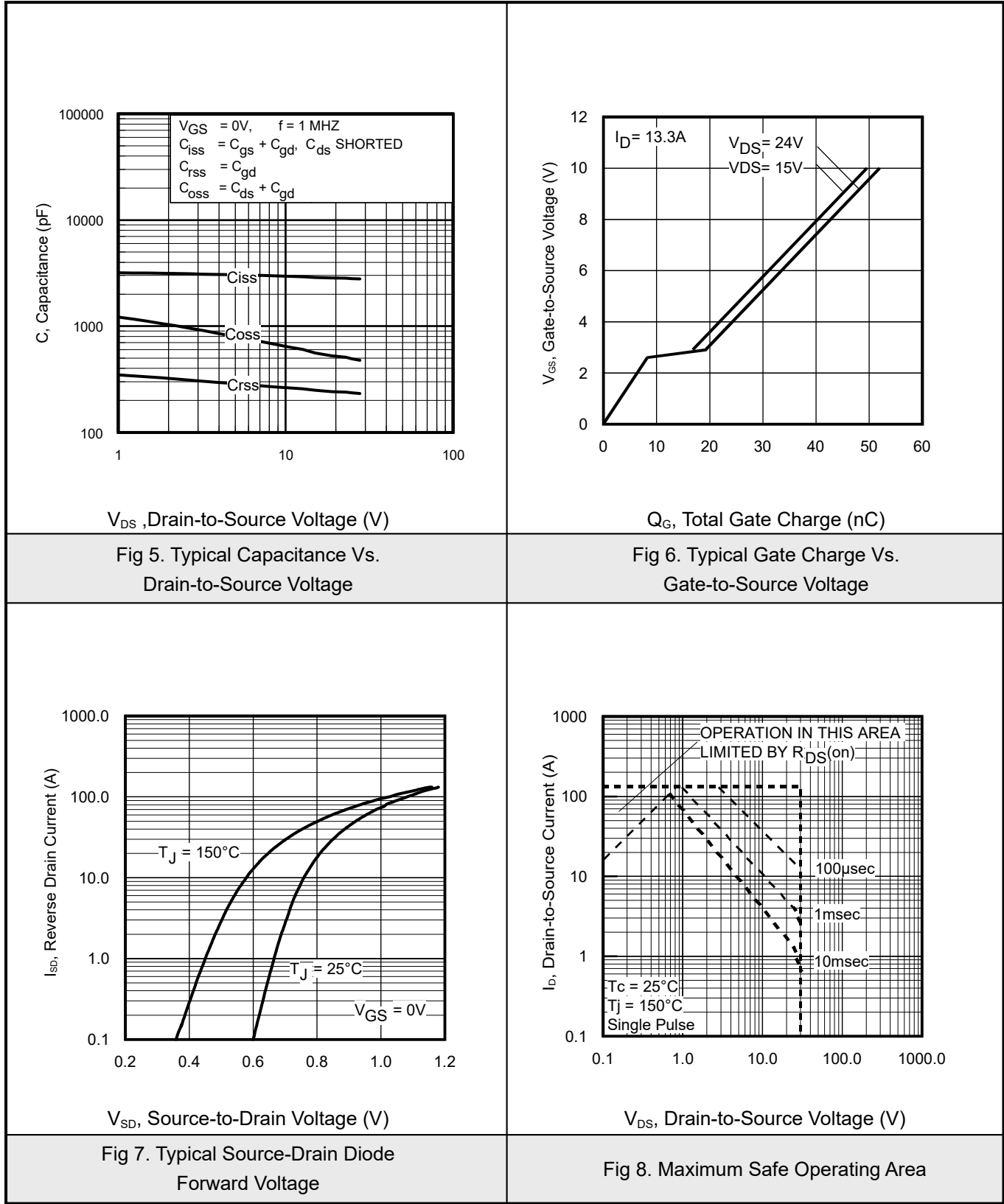


8.1Typical Characterisitics

 $I_{D-Drain-to-Source}$ Current (A) V_{GS} TOP 10V 4.5V 3.7V 3.5V 3.3V 3.0V 2.7V BOTTOM 2.5V 20µs PULSE WIDTH $T_J = 25^{\circ}C$ V_{DS} - Drain-to-Source Voltage (V)	 $I_{D-Drain-to-Source}$ Current (A) V_{GS} TOP 10V 4.5V 3.7V 3.5V 3.3V 3.0V 2.7V BOTTOM 2.5V 20µs PULSE WIDTH $T_J = 150^{\circ}C$ V_{DS} - Drain-to-Source Voltage (V)
Fig 1. Typical Output Characteristics	Fig 2. Typical Output Characteristics
 $I_{D-Drain-to-Source}$ Current (A) $T_J = 150^{\circ}C$ $T_J = 25^{\circ}C$ $V_{DS} = 15V$ 20µs PULSE WIDTH V_{GS}, Gate-to-Source Voltage (V)	 $R_{DS(on)}$, Drain-to-Source On Resistance (Normalized) $I_D = 16.6A$ $V_{GS} = 10V$ T_J, Junction Temperature ($^{\circ}C$)
Fig 3. Typical Transfer Characteristics	Fig 4. Nomalized On-ResistanceVs. Temperature

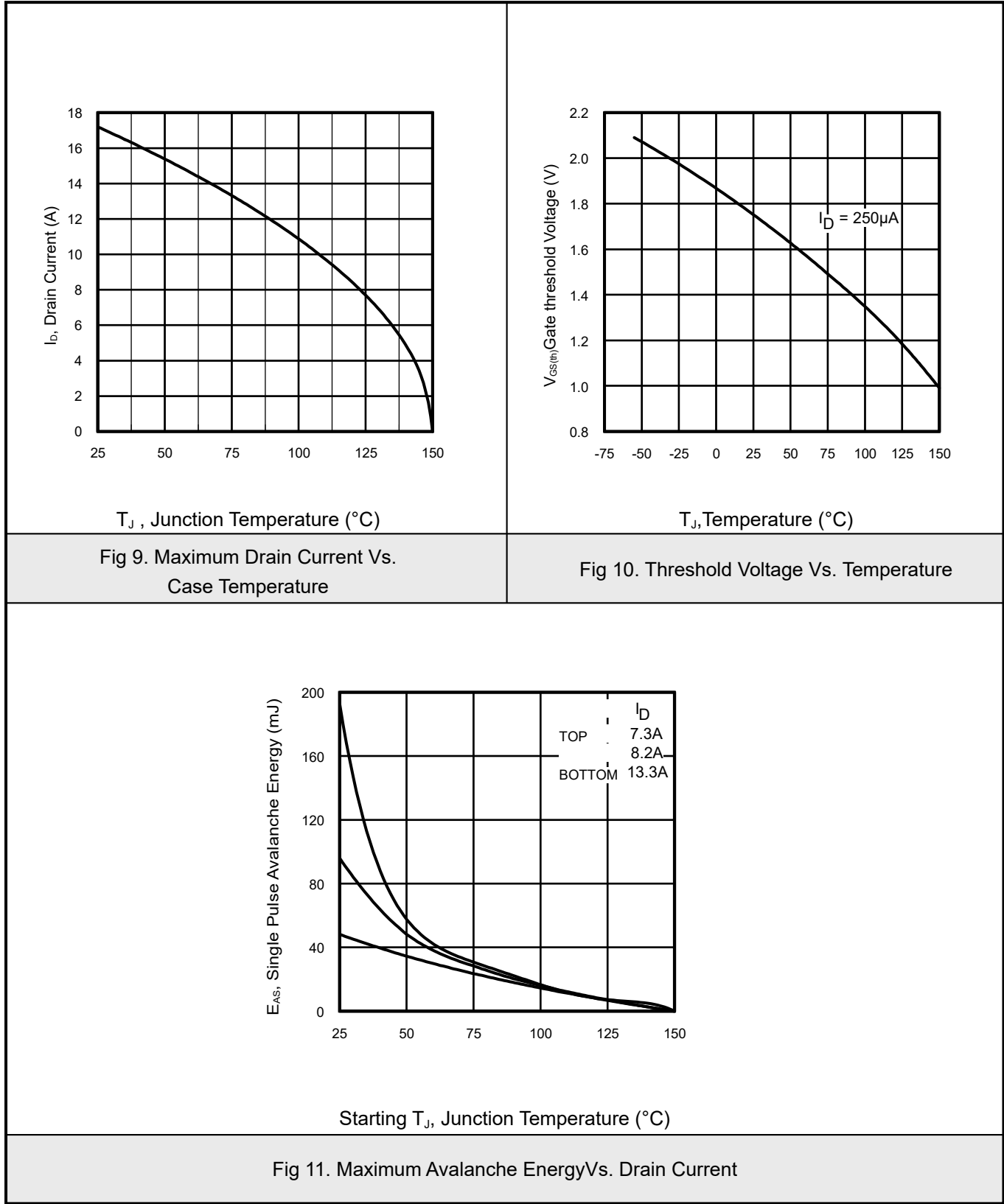


8.2Typical Characteristics



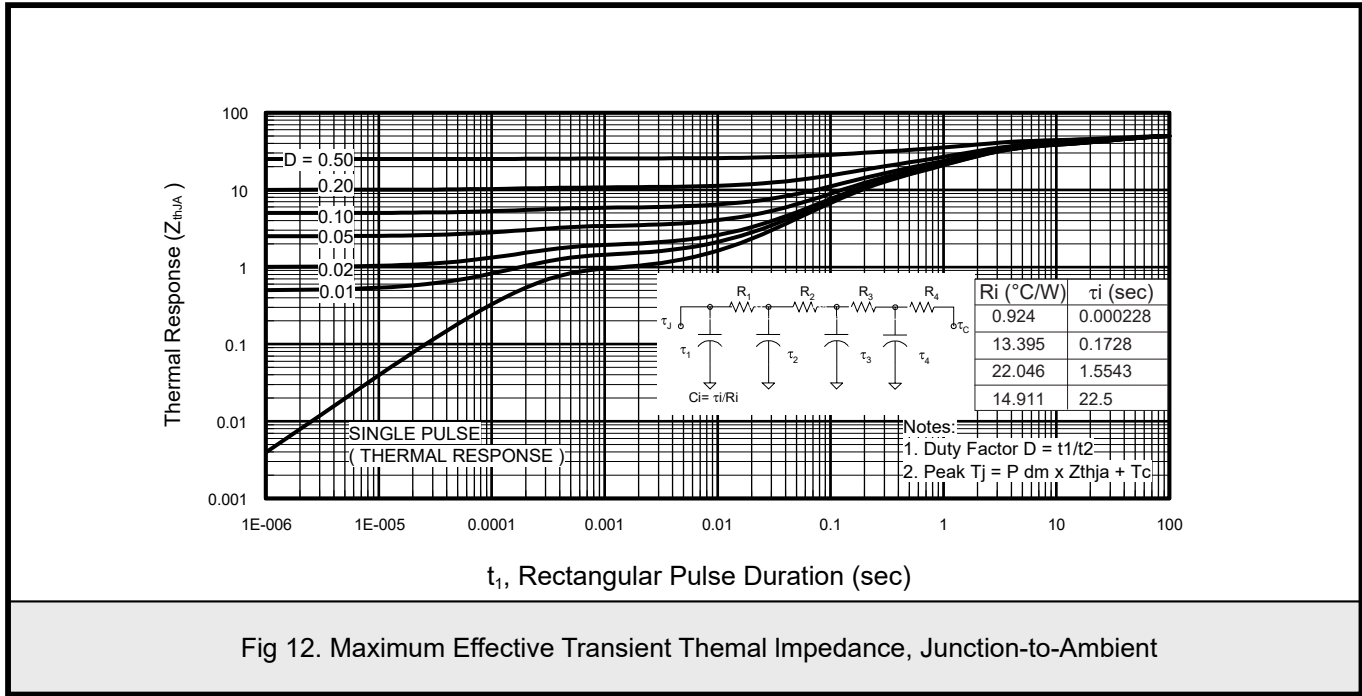


8.3Typical Characterisitics





8.4Typical Characterisitics





8.5 Typical Characteristics

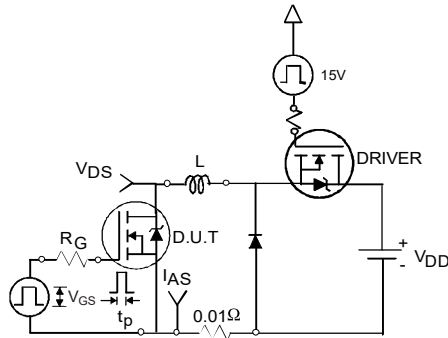


Fig 13a. Unclamped Inductive Test Circuit

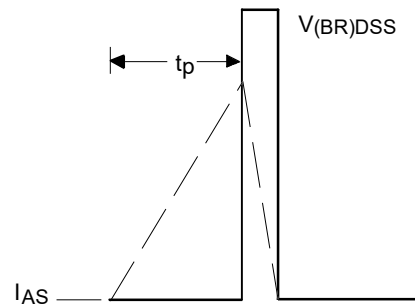


Fig 13b. Unclamped Inductive Waveforms

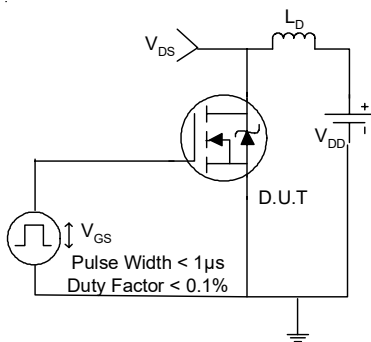


Fig 14a. Switching Time Test Circuit

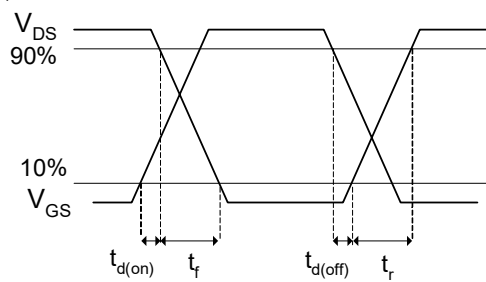


Fig 14b. Switching Time Waveforms

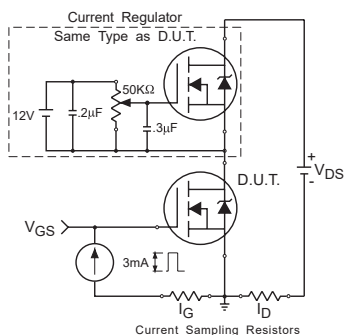
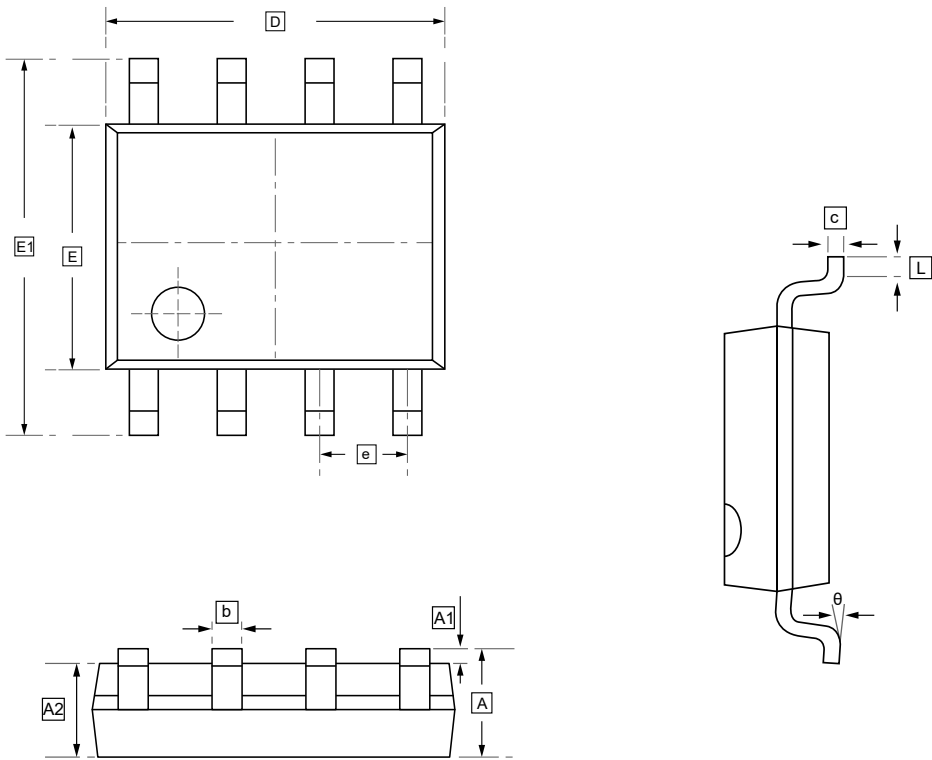


Fig 15a. Gate Charge Test Circuit



9.SOP-8 Package Outline Dimensions

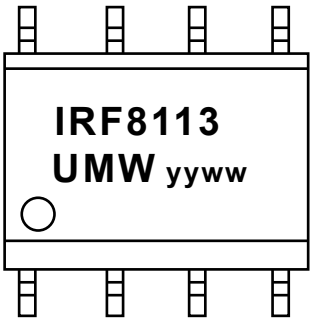


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	8°



10.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRF8113TR	SOP-8	3000	Tape and reel



11.Disclaimer

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