

Features <ul style="list-style-type: none"> ➤ Super Low Gate Charge ➤ 100% EAS Guaranteed ➤ Green Device Available ➤ Excellent Cdv/dt effect decline ➤ Advanced high cell density Trench technology 	Bvdss	Rdson	ID
	100V	70mΩ	10A
	-100V	180mΩ	-5A
	Application <div style="float: right; border: 1px solid green; border-radius: 50%; padding: 2px 5px; color: white; font-weight: bold;">RoHS</div> <ul style="list-style-type: none"> ➤ Power management in half bridge and inverters ➤ Load Switch ➤ DC-DC Converter 		

Package			
<p>Marking and pin assignment</p>	<p>SOP-8 top view</p>	<p>Schematic diagram</p>	

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
10G10	10G10S	SOP-8	3000

Absolute Maximum Ratings

Parameter	Symbol	Value		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	V_{DS}	100	-100	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Continuous Drain Current	$I_D@T_c=25^\circ\text{C}, V_{GS}@10\text{V}^1$	10	-5	A
	$I_D@T_c=70^\circ\text{C}, V_{GS}@10\text{V}^1$	6	-3.5	A
Pulsed Drain Current ²	I_{DM}	25	-9.5	A
Single Pulsed Avalanche Energy ³	EAS	22.5	35.3	mJ
Avalanche Current	I_{AS}	22.6	-22.6	A
Total Power Dissipation ⁴	$P_D@T_c=25^\circ\text{C}$	2.5	2.5	W
Operating Junction Temperature Range	T_J	-55 ~ +150		°C
Storage Temperature Range	T_{STG}	-55 ~ +150		°C



Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	85	°C/W
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	62.5	°C/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL10G10S	SOP-8	2,4	5,6,7,8	1,3	Tape Reel

N-Channel Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
Gate to Body Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	-	2.5	V
Static Drain-Source On-Resistance ⁴	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$	-	70	90	m Ω
		$V_{GS}=4.5V, I_D=3A$	-	75	105	
Forward Transconductance ⁴	gfs	$V_{DS}=5V, I_D=5A$	-	12	-	S
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	-	1220	-	pF
Output Capacitance	C_{oss}		-	53	-	
Reverse Transfer Capacitance	C_{riss}		-	42	-	
Gate Resistance	R_g	$f=1\text{MHz}$	-	1.3	-	Ω
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=50V, I_D=5A$	-	20.6	-	nC
Gate-Source Charge	Q_{gs}		-	4	-	
Gate-Drain Charge	Q_{gd}		-	3.7	-	
Turn-On Delay Time	$T_{d(on)}$	$V_{GS}=10V, V_{DD}=50V,$ $R_G=3\Omega, I_D=5A$	-	4.7	-	ns
Rise Time	T_r		-	21	-	
Turn-Off Delay Time	$T_{d(off)}$		-	20	-	
Fall Time	T_f		-	16	-	
Diode Forward Voltage	V_{SD}	$I_S=1A, V_{GS}=0V$	-	-	1.2	V
Continuous Source Current	I_S	-	-	-	10	A

**P-Channel Electrical Characteristics** ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-80V, V_{GS}=0V$	-	-	-1	μA
Gate to Body Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-	-2.5	V
Static Drain-Source On-Resistance ²	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-3A$	-	180	220	m Ω
		$V_{GS}=-4.5V, I_D=-2A$	-	210	255	
Input Capacitance	C_{iss}	$V_{DS}=-30V, V_{GS}=0V, f=1\text{MHz}$	-	1228	-	pF
Output Capacitance	C_{oss}		-	41	-	
Reverse Transfer Capacitance	C_{rss}		-	29	-	
Gate Resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	-	13	-	Ω
Total Gate Charge(-10V)	Q_g	$V_{GS}=-10V, V_{DS}=-50V, I_D=-2A$	-	19	-	nC
Gate-Source Charge	Q_{gs}		-	3.4	-	
Gate-Drain Charge	Q_{gd}		-	2.9	-	
Turn-On Delay Time	$T_{d(on)}$	$V_{GS}=-10V, V_{DD}=-30V,$ $R_G=3.3\Omega, I_D=-1A$	-	9	-	ns
Rise Time	T_r		-	6	-	
Turn-Off Delay Time	$T_{d(off)}$		-	39	-	
Fall Time	T_f		-	33	-	
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	-	-	-1.2	V
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	-	-	-5	A

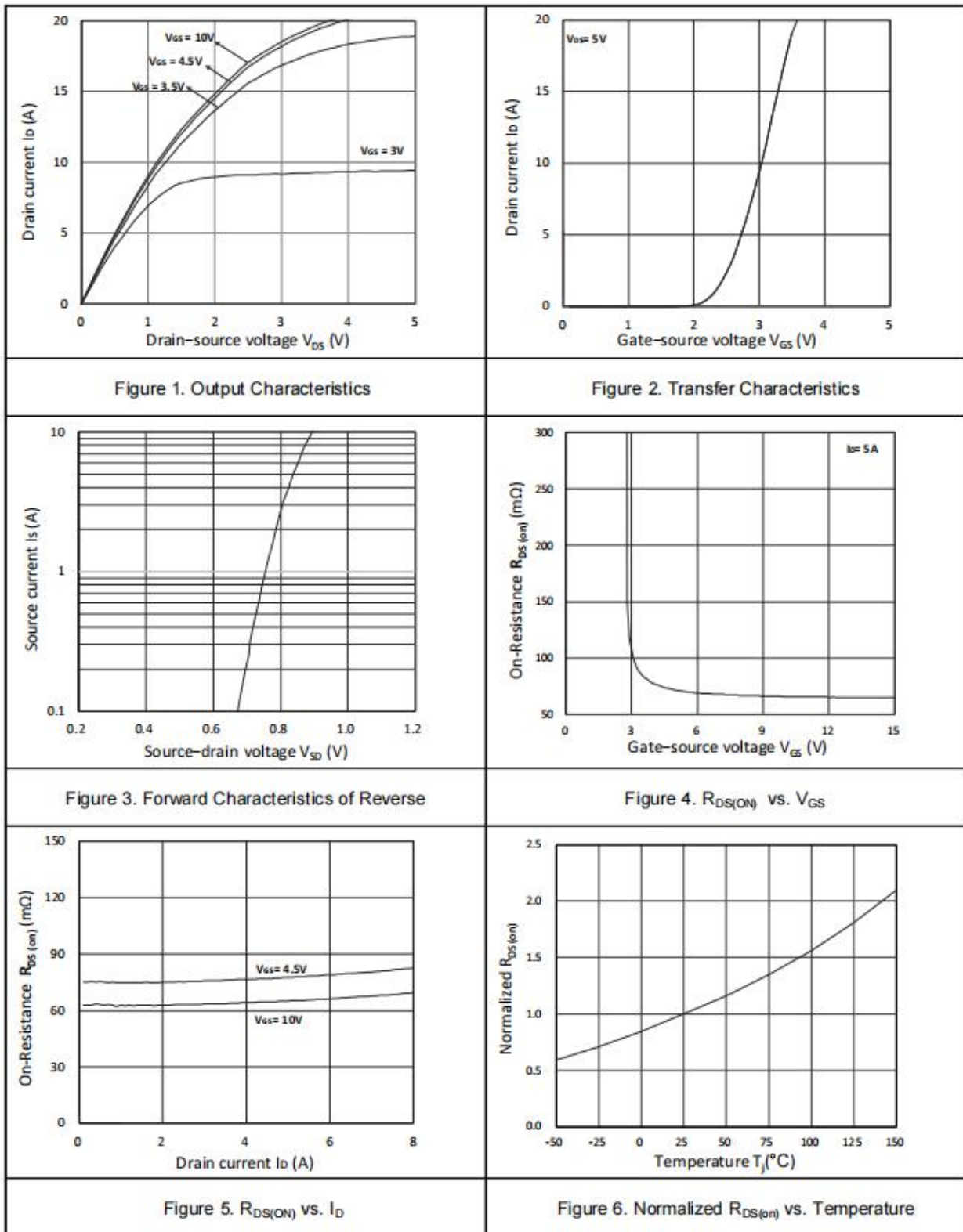
N-Channel Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating. The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=8A$
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

P-Channel Note :

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating. The test condition is $V_{DD}=-25V, V_{GS}=-10V, L=0.5\text{mH}, I_{AS}=-14A$
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

N-Channel Typical Characteristics



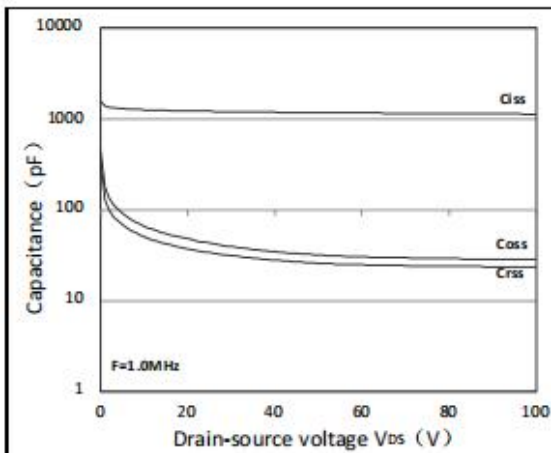


Figure 7. Capacitance Characteristics

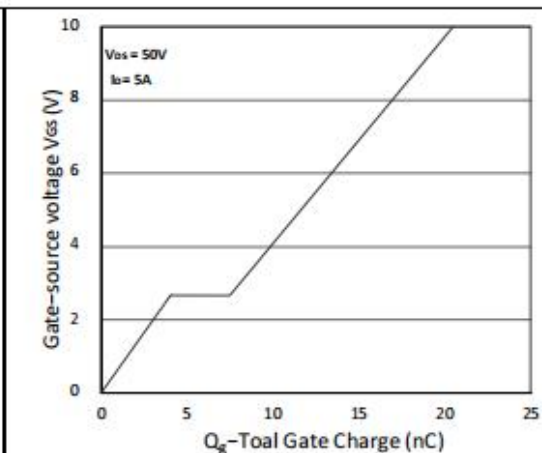


Figure 8. Gate Charge Characteristics

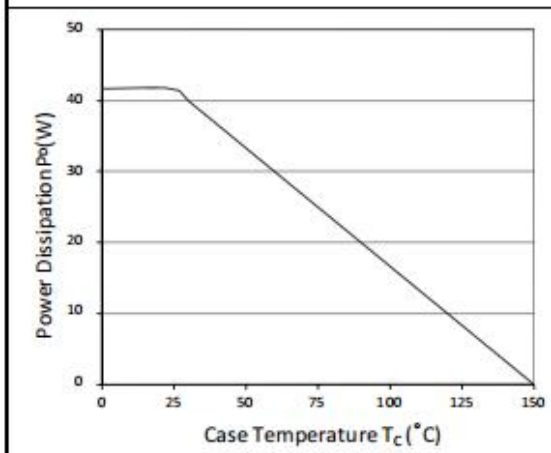


Figure 9. Power Dissipation

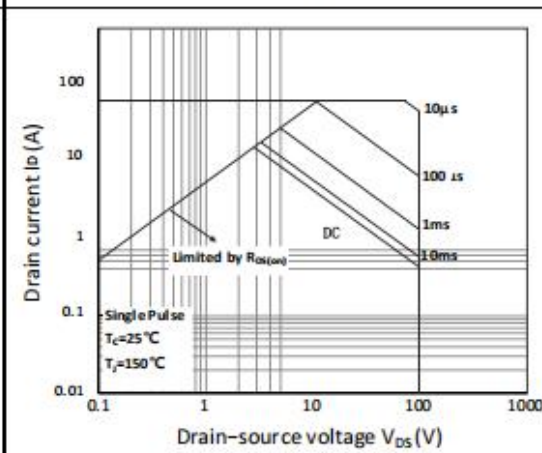


Figure 10. Safe Operating Area

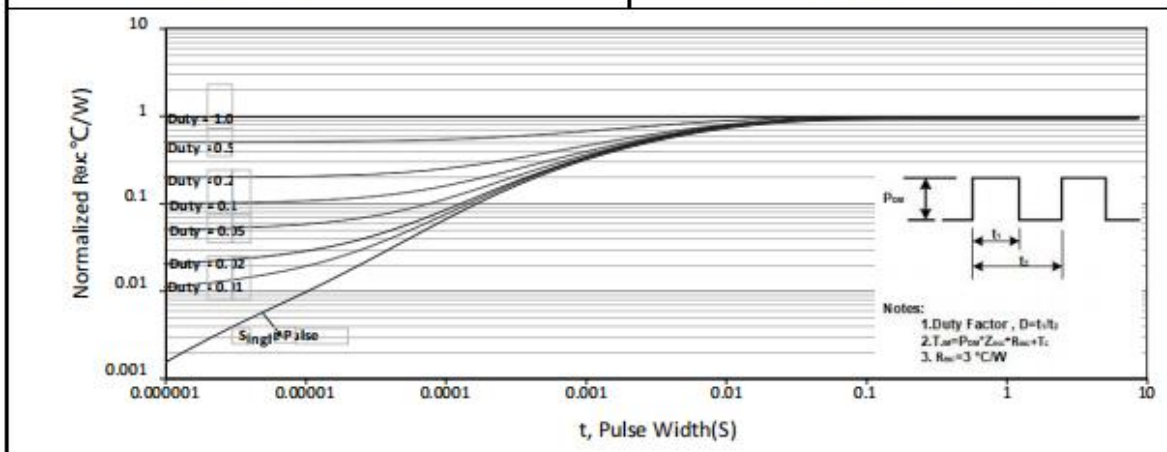


Figure 11. Normalized Maximum Transient Thermal Impedance

P-Channel Typical Characteristics

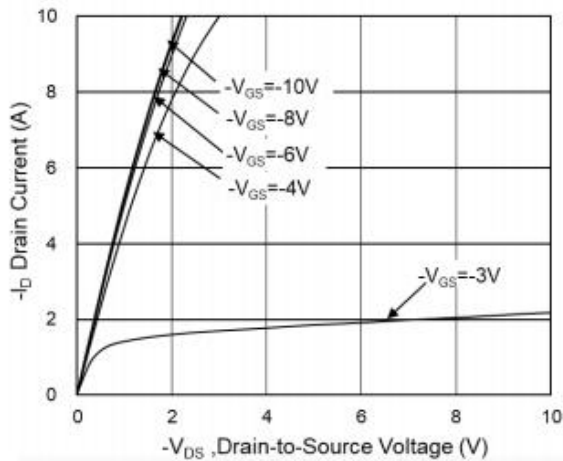


Fig.1 Typical Output Characteristics

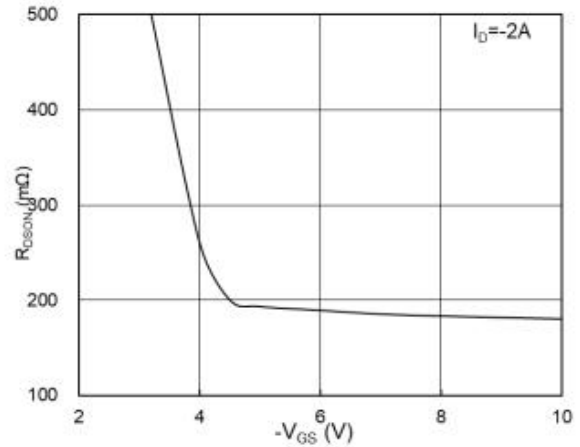


Fig.2 On-Resistance vs G-S Voltage

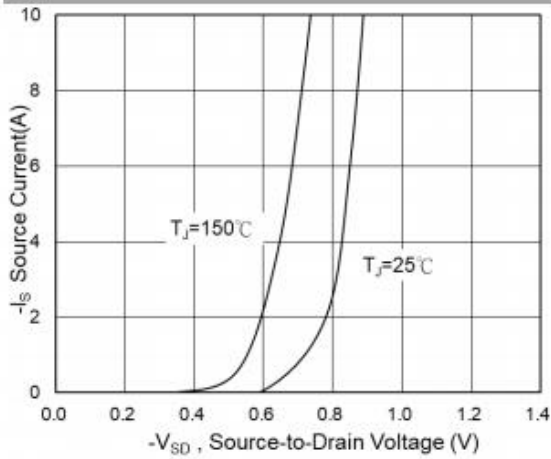


Fig.3 Source Drain Forward Characteristics

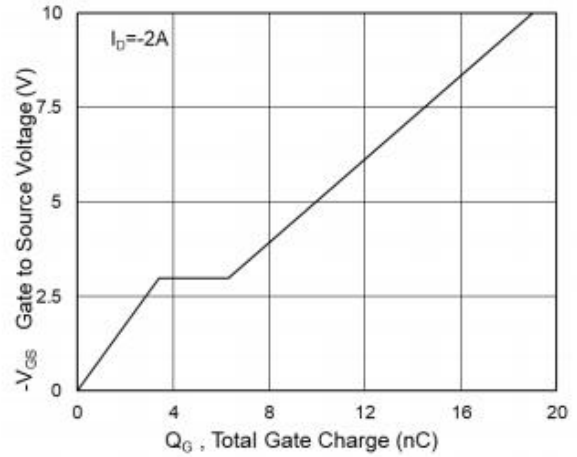


Fig.4 Gate-Charge Characteristics

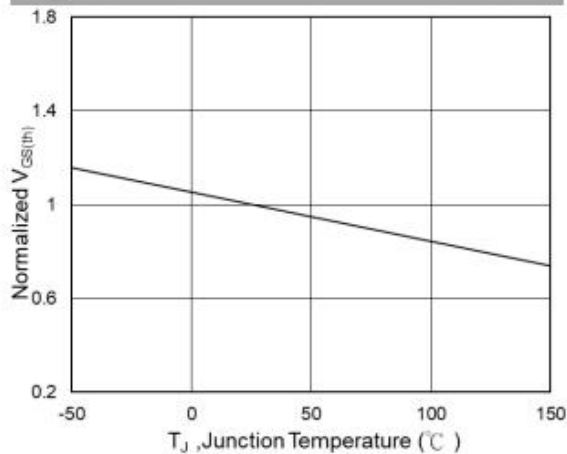


Fig.5 Normalized $V_{GS(th)}$ vs T_J

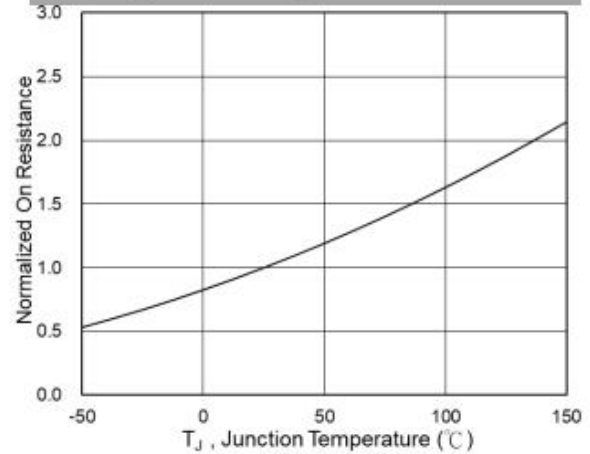


Fig.6 Normalized $R_{DS(on)}$ vs T_J

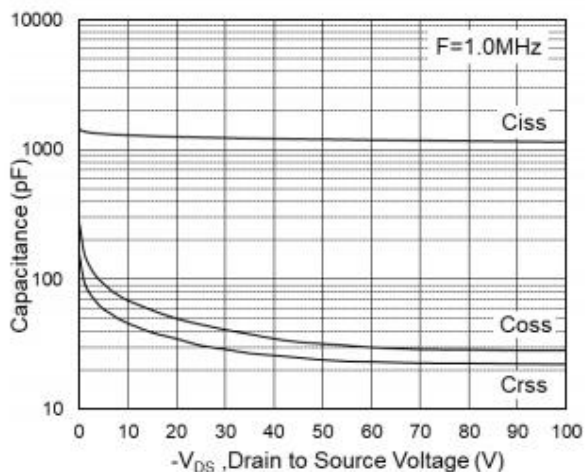


Fig.7 Capacitance

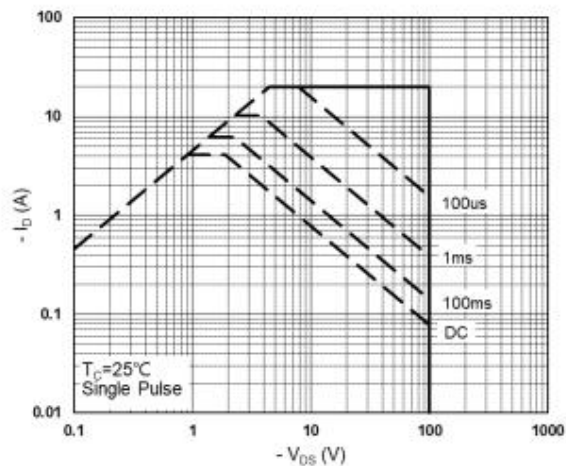


Fig.8 Safe Operating Area

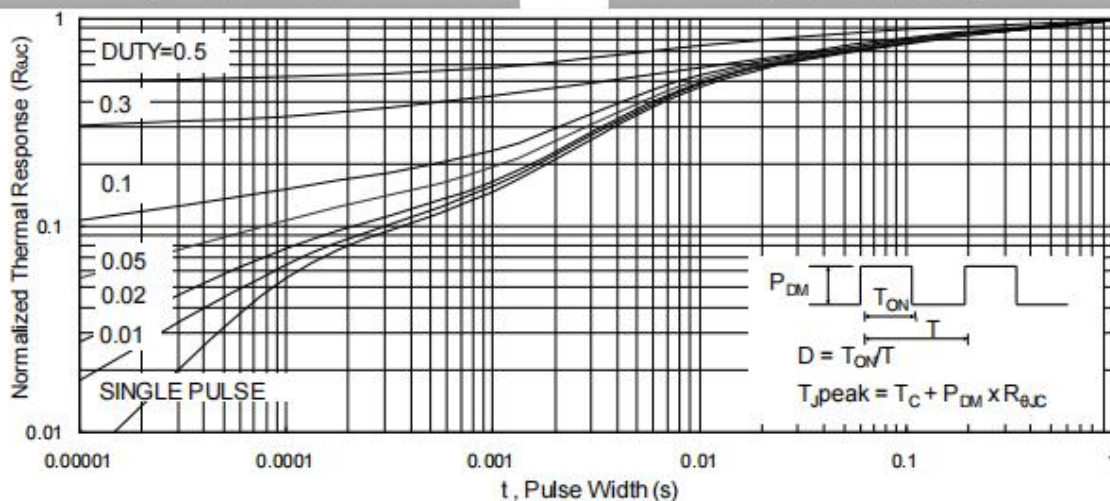


Fig.9 Normalized Maximum Transient Thermal Impedance

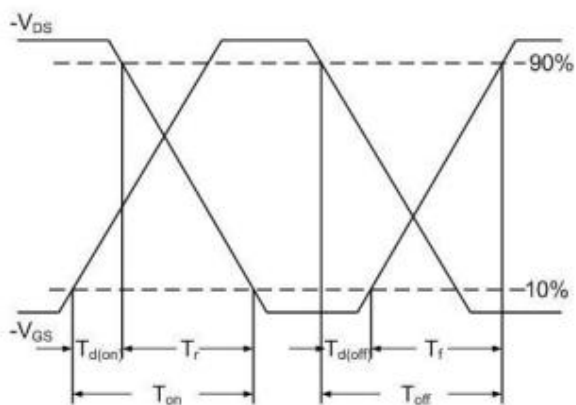


Fig.10 Switching Time Waveform

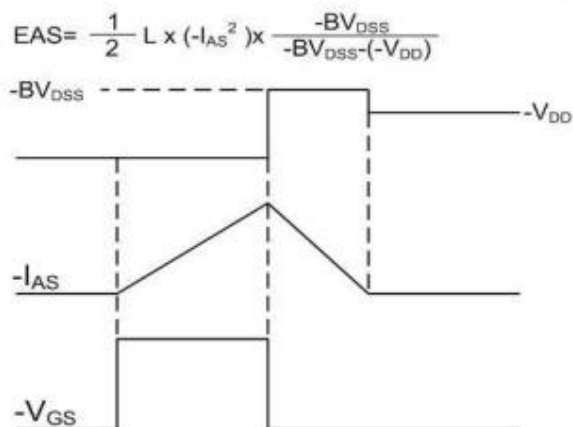
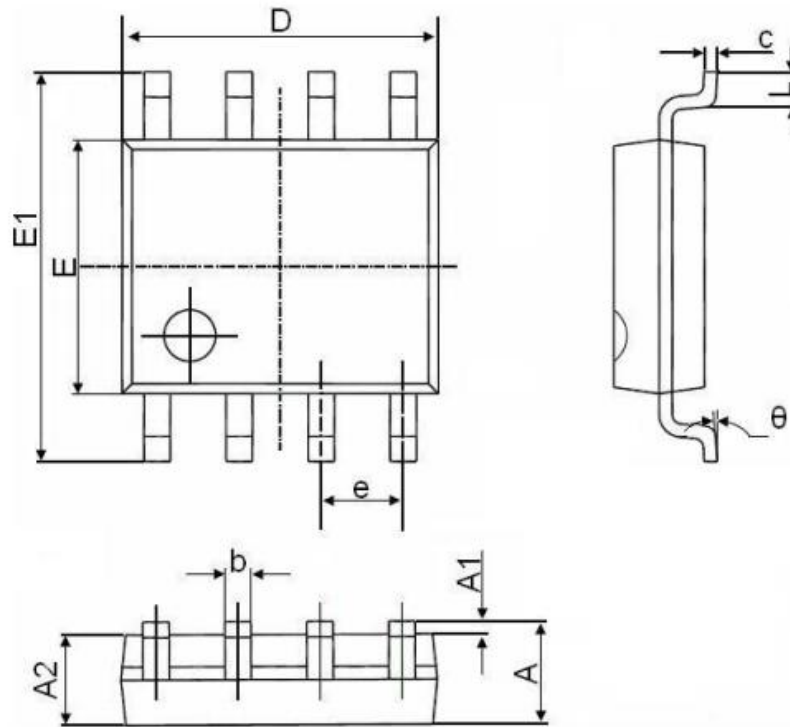


Fig.11 Unclamped Inductive Waveform

Package Dimensions SOP-8


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
theta	0°	8°	0°	8°



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