

60V N+P-CHANNEL ENHANCEMENT MODE MOSFET

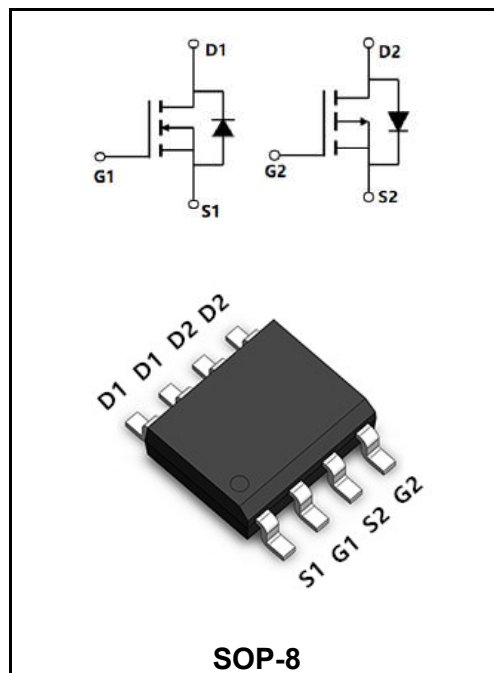
MAIN CHARACTERISTICS

I_D	8.5A
V_{DSS}	60V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 52mΩ (Type:38 mΩ)
I_D	-7.7A
V_{DSS}	-60V
$R_{DS(on)-typ}(@V_{GS}=-10V)$	< 100mΩ (Type:80 mΩ)



Application

- ◆Wireless charging
- ◆Boost driver
- ◆Brushless motor



Product Specification Classification

Part Number	Package	Marking	Pack
YFW8G06S	SOP-8	YFW 8G06S XXXXX	3000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value		Units
		N-Ch	P-Ch	
Drain-Source Voltage	V_{DS}	60	-60	V
Gate - Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current, $V_{GS} @ 10V^1 @ T_A=25^\circ C$	I_D	8.5	-7.7	A
Continuous Drain Current, $V_{GS} @ 10V^1 @ T_A=70^\circ C$	I_D	4.0	-3	A
Pulsed Drain Current ²	I_{DM}	20	-14	A
Single Pulse Avalanche Energy ³	E_{AS}	22	28.8	mJ
Avalanche Current	I_{AS}	21	-24	A
Total Power Dissipation ⁴ @ $T_A=25^\circ C$	P_D	2	2	W
Storage Temperature Range	T_{STG}	-55 to +150		°C
Operating Junction Temperature Range	T_J	-55 to +150		°C
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	85		°C/W
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	62.5		°C/W

N-Channel Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	BV_{DSS}	60	65	-	V
BVDSS Temperature Coefficient	Reference to 25 °C, I _D =1mA	ΔBV_{DSS}/ΔT_J	-	0.063	-	V/°C
Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =5A	R_{DS(ON)}	-	38	52	mΩ
	V _{GS} =4.5V, I _D =4A		-	55	75	
Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	V_{GS(th)}	1.2	1.75	2.5	V
V _{GS(th)} Temperature Coefficient		ΔV_{GS(th)}	-	-5.24	-	mV/°C
Drain-Source Leakage Current	V _{DS} =48V, V _{GS} =0V, T _J =25 °C	I_{DSS}	-	-	1	uA
	V _{DS} =48V, V _{GS} =0V, T _J =55 °C		-	-	5	
Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V _{DS} = 5V, I _D = 4A	g_{fs}	-	28	-	S
Total Gate Charge(4.5V)	V _{DS} =48V V _{GS} =4.5V I _D =4A	Q_g	-	19	-	nC
Gate-Source Charge		Q_{gs}	-	2.6	-	
Gate-Drain Charge		Q_{gd}	-	4.1	-	
Turn-on delay time	V _{DD} =30V V _{GS} =10V R _G = 3.3Ω I _D = 4A	t_{d(on)}	-	3	-	ns
Rise Time		T_r	-	34	-	
Turn-Off Delay Time		t_{d(OFF)}	-	23	-	
Fall Time		t_f	-	6.0	-	
Input Capacitance	V _{DS} =15V V _{GS} =0V f=1MHz	C_{iss}	-	1027	-	pF
Output Capacitance		C_{oss}	-	65	-	
Reverse Transfer Capacitance		C_{rss}	-	45	-	
Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	I_S	-	-	2.5	A
Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25 °C	V_{SD}	-	-	1.2	V

Note :

- 1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、 The power dissipation is limited by 150 °C junction temperature
- 4、 The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation

P-Channel Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	BV_{DSS}	-60	-65	-	V
BVDSS Temperature Coefficient	Reference to 25 °C, I _D =-1mA	ΔBV_{DSS}/ΔT_J	-	-0.03	-	V/°C
Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-3A	R_{DS(ON)}	-	80	100	mΩ
	V _{GS} =-4.5V, I _D =-2A		-	100	105	
Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	V_{GS(th)}	-1.2	1.75	-2.5	V
Drain-Source Leakage Current	V _{DS} =-48V, V _{GS} =0V, T _J =25 °C	I_{DSS}	-	-	1	uA
	V _{DS} =-48V, V _{GS} =0V, T _J =55 °C		-	-	5	
Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V _{DS} =-5V, I _D = -3A	g_{fs}	-	8.5	-	S
Total Gate Charge(-4.5V)	V _{DS} =-48V V _{GS} =-4.5V I _D =-3A	Q_g	-	12.1	-	nC
Gate-Source Charge		Q_{gs}	-	2.2	-	
Gate-Drain Charge		Q_{gd}	-	6.3	-	
Turn-on delay time	V _{DD} =-15V V _{GS} =-10V R _G = 3.3 I _D =-1A	t_{d(on)}	-	9.2	-	ns
Rise Time		T_r	-	20.1	-	
Turn-Off Delay Time		t_{d(OFF)}	-	46.7	-	
Fall Time		t_f	-	9.4	-	
Input Capacitance	V _{DS} =-15V V _{GS} =0V f=1MHz	C_{iss}	-	1137	-	pF
Output Capacitance		C_{oss}	-	76	-	
Reverse Transfer Capacitance		C_{rss}	-	50	-	
Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	I_S	-	-	-2.5	A
Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A, T _J =25 °C	V_{SD}	-	-	-1.2	V

Note :

- 1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The power dissipation is limited by 150 °C junction temperature
- 4、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

N-Channel Typical Characteristics

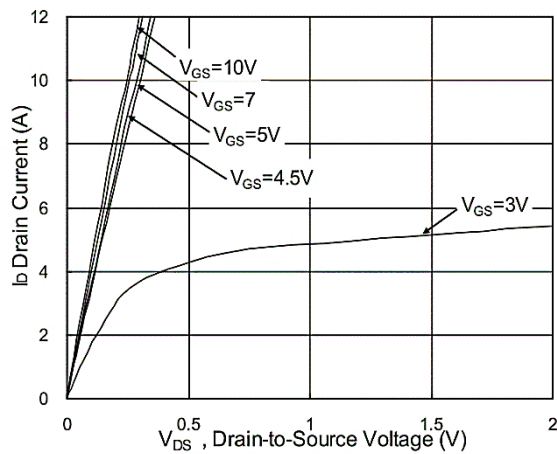


Fig.1 Typical Output Characteristics

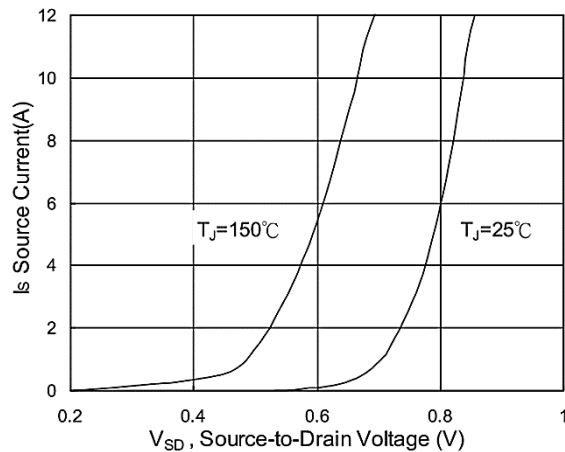


Fig.3 Source Drain Forward Characteristics

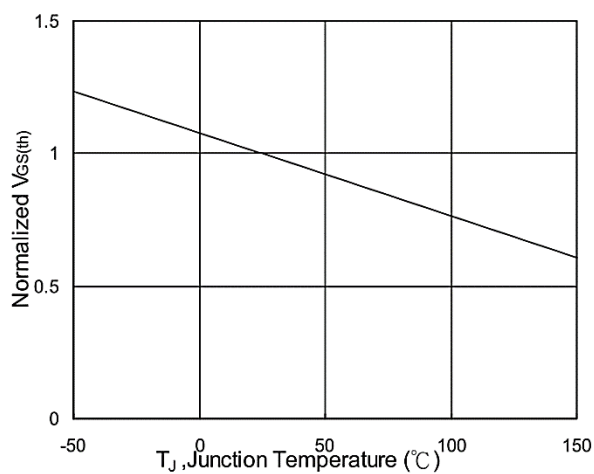


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

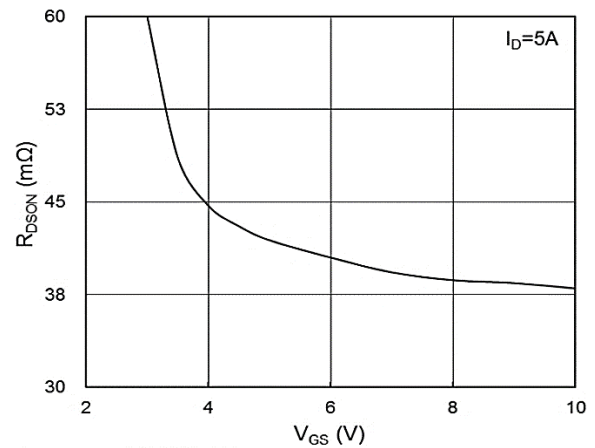


Fig.2 On-Resistance vs. G-S Voltage

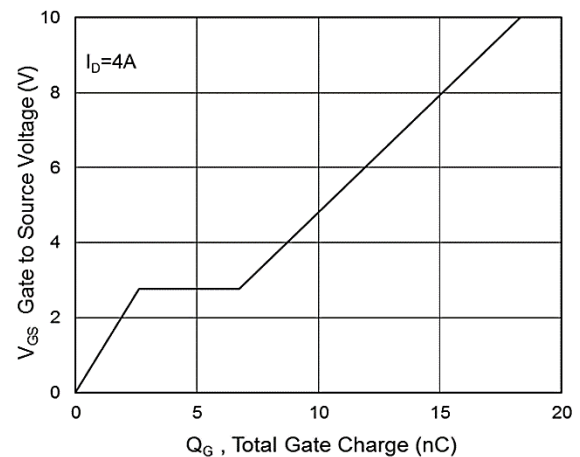


Fig.4 Gate-Charge Characteristics

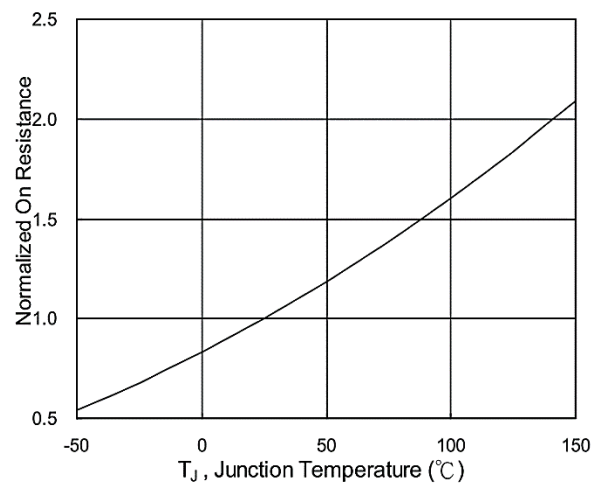
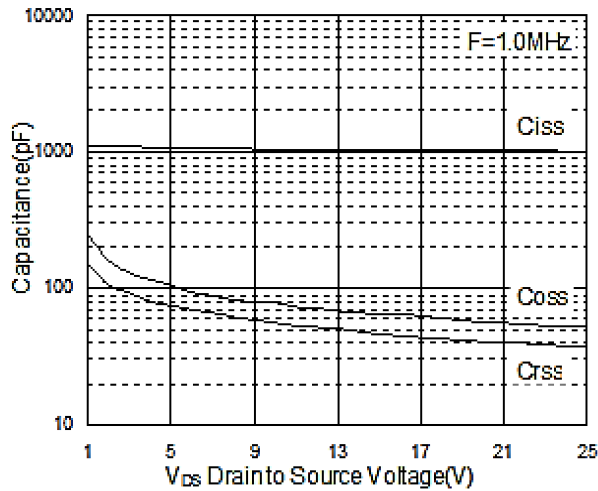
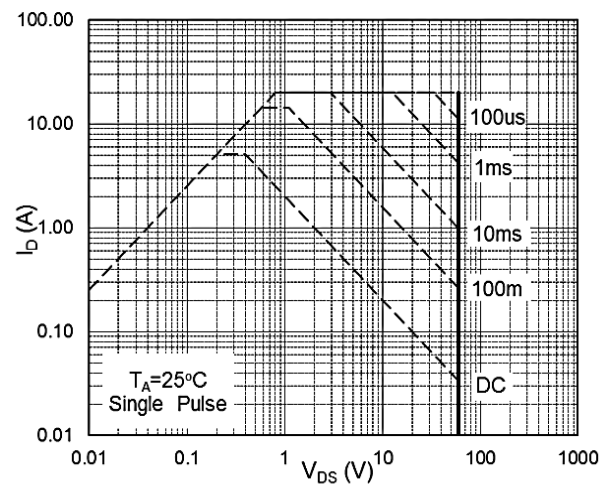
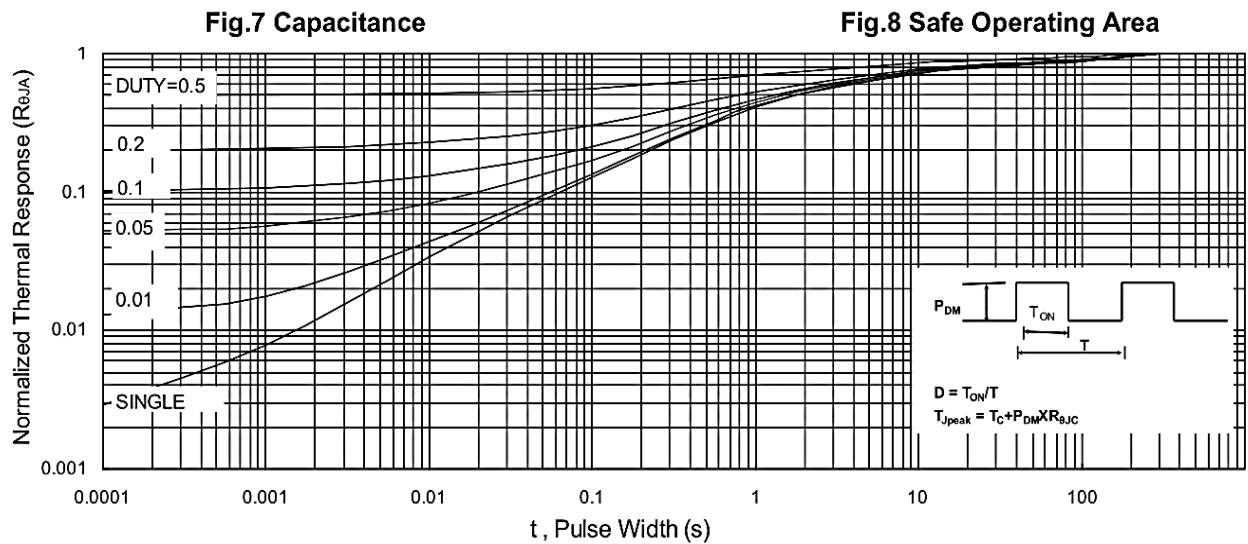
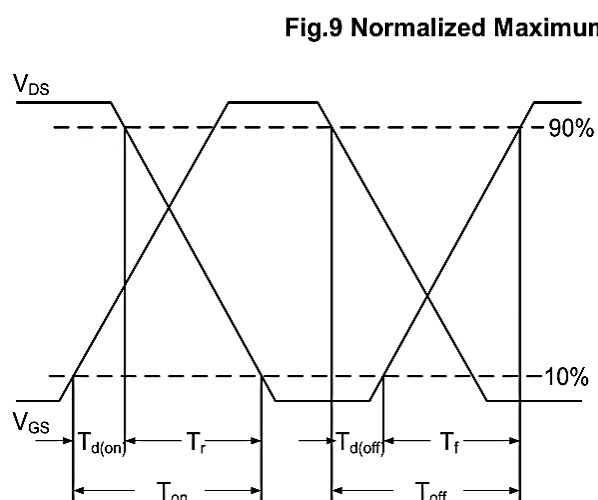
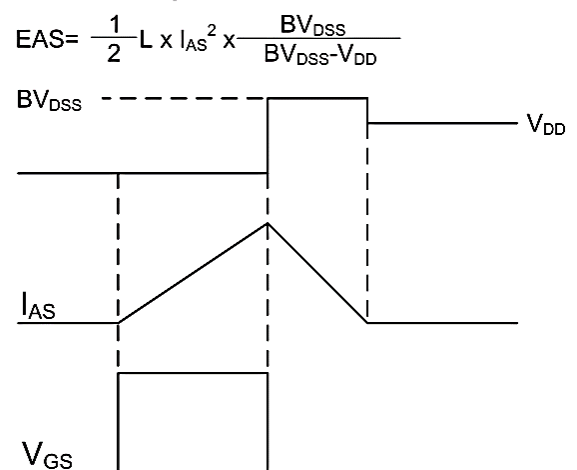


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Ratings and Characteristic Curves



Ratings and Characteristic Curves

P-Channel Typical Characteristics

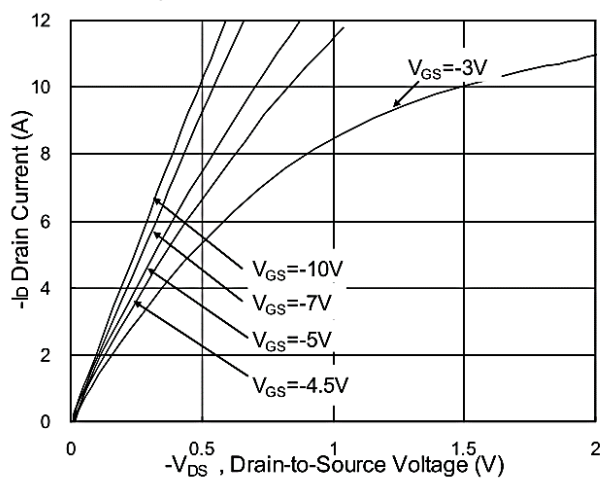


Fig.1 Typical Output Characteristics

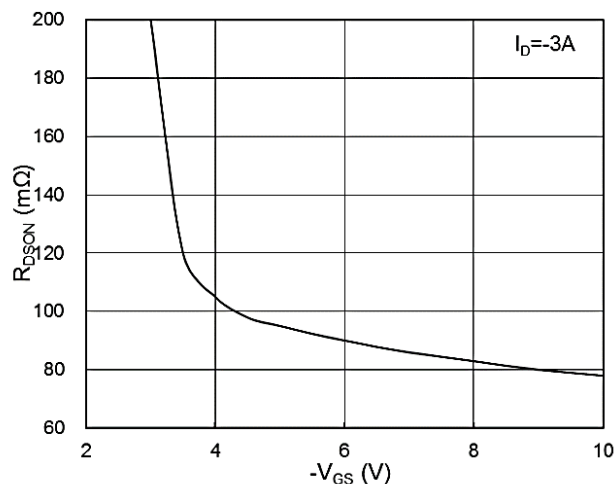


Fig.2 On-Resistance vs. G-S Voltage

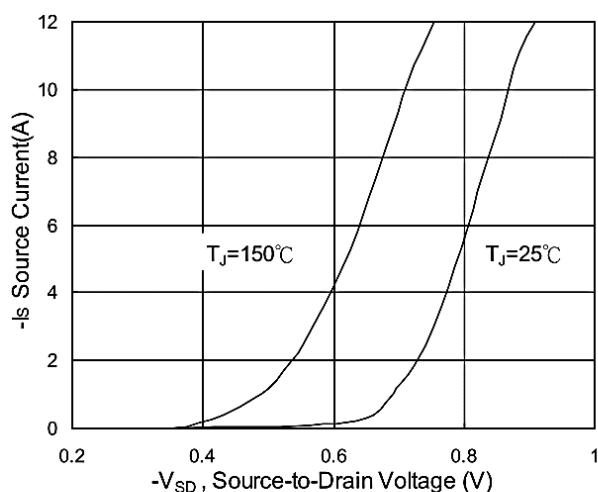


Fig.3 Source Drain Forward Characteristics

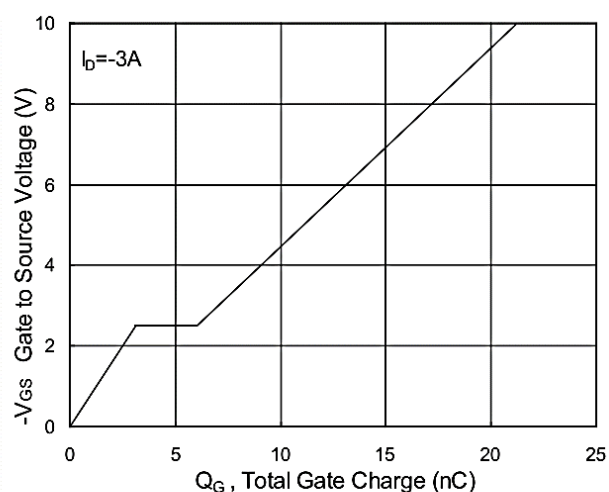


Fig.4 Gate-Charge Characteristics

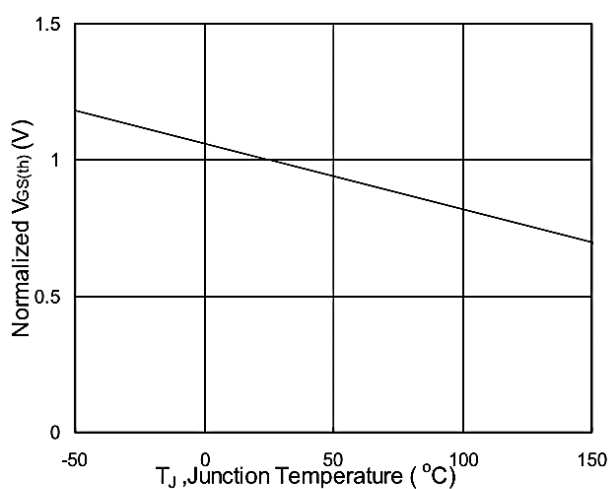


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

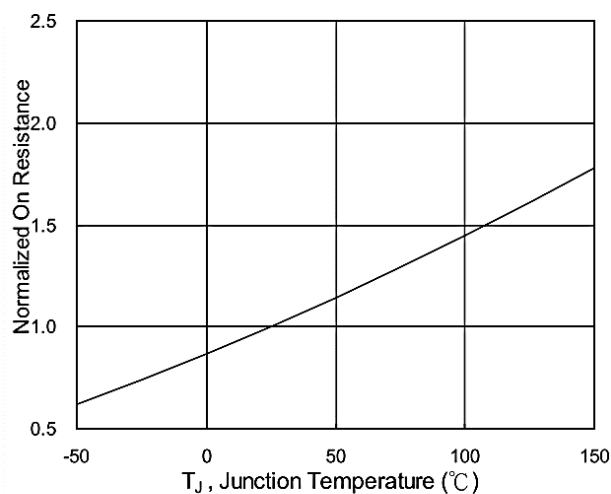


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Ratings and Characteristic Curves

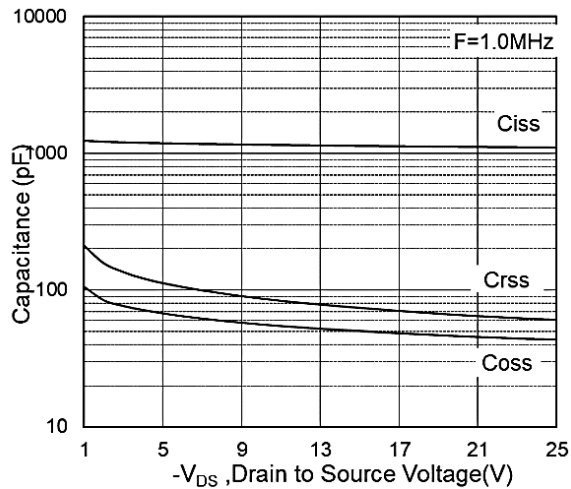


Fig.7 Capacitance

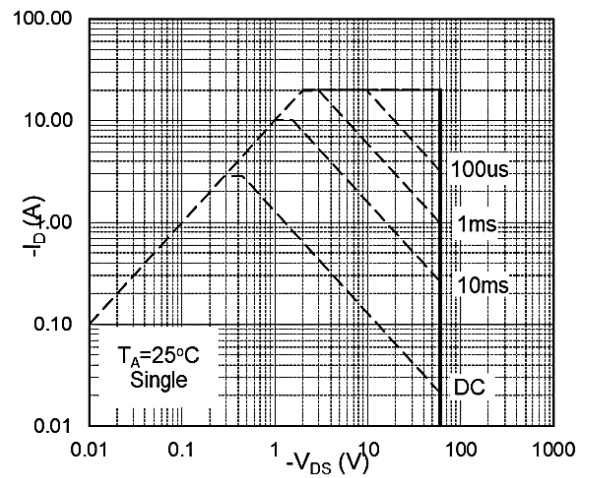


Fig.8 Safe Operating Area

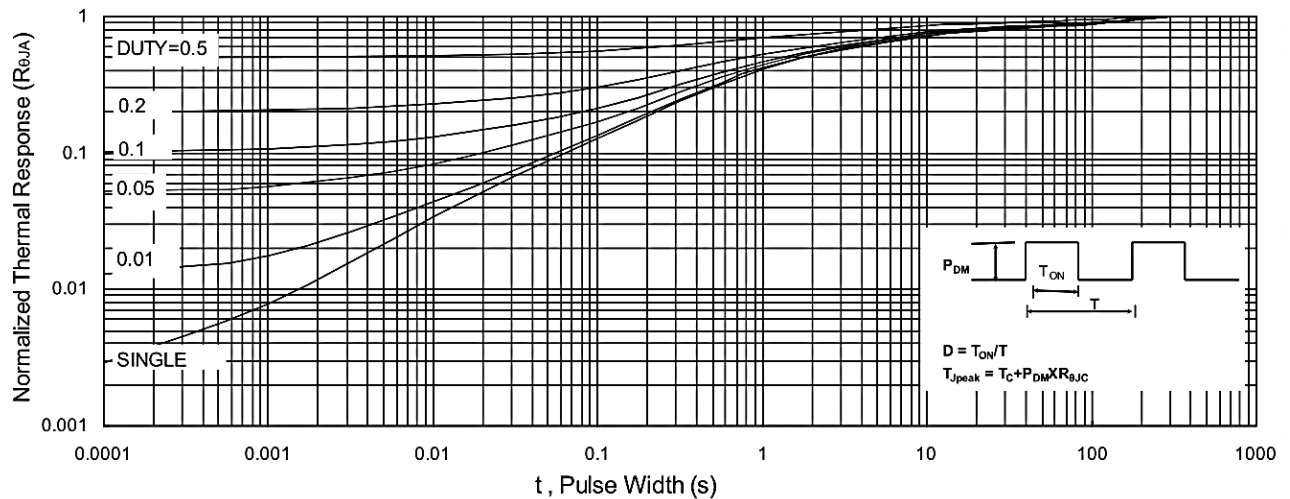


Fig.9 Normalized Maximum Transient Thermal Impedance

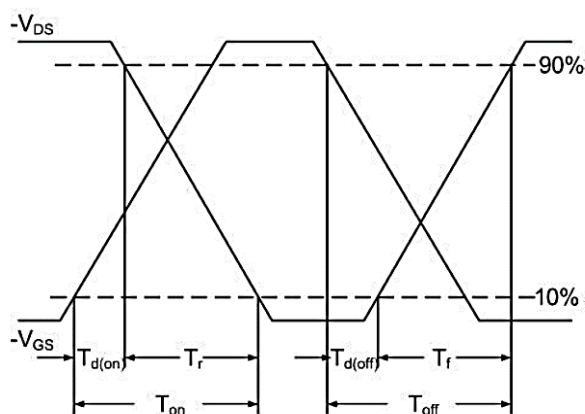


Fig.10 Switching Time Waveform

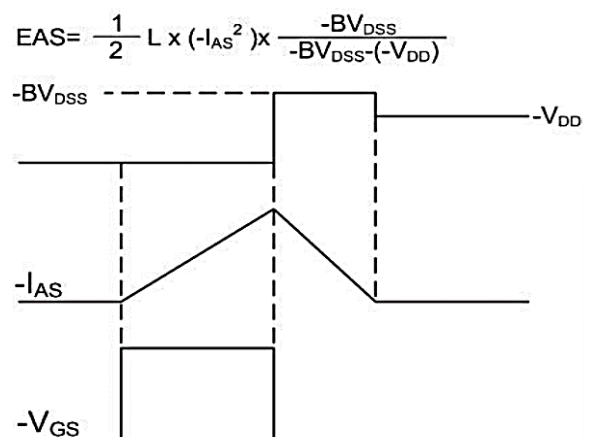
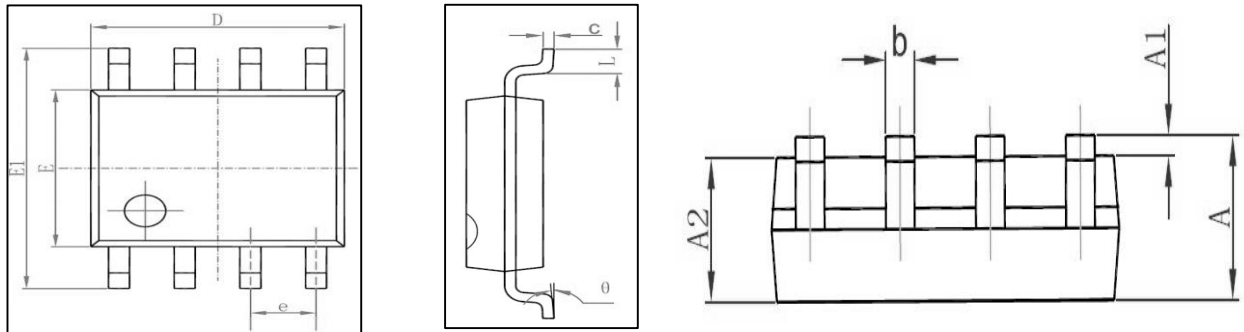
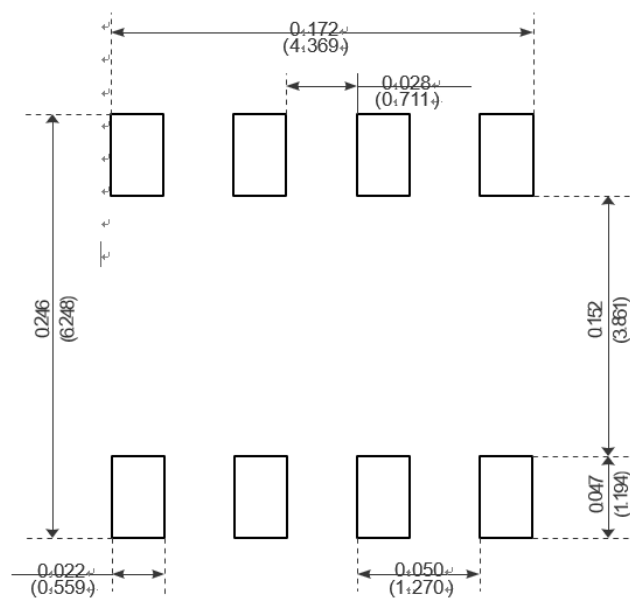


Fig.11 Unclamped Inductive Waveform

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
θ	0°	8°	0°	8°



Recommended Minimum Pads