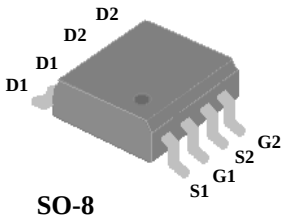
N AND P-CHANNEL ENHANCEMENT MODE POWER MOSFET

PRODUCT SUMMARY

Simple Drive Requirement
Low Gate Charge
Fast Switching Performance



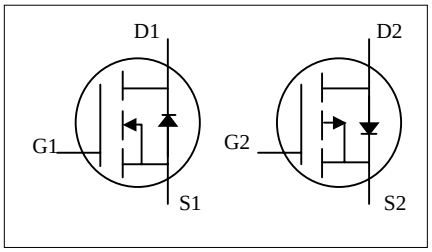
SO-8

N-CH	BV_{DSS}	20V
	$R_{DS(ON)}$	18mΩ
	I_D	8.3A
P-CH	BV_{DSS}	-20V
	$R_{DS(ON)}$	45mΩ
	I_D	-5A

DESCRIPTION

The advanced power MOSFETs from Silicon Standard Corp. provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The SO-8 package is widly preferred for commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.



Pb-free; RoHS-compliant

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Rating		Units
		N-channel	P-channel	
V_{DS}	Drain-Source Voltage	20	-20	V
V_{GS}	Gate-Source Voltage	±12	±12	V
I_D@T_A=25℃	Continuous Drain Current[3]	8.3	-5	A
I_D@T_A=70℃	Continuous Drain Current[3]	6.5	-4	A
I_{DM}	Pulsed Drain Current[1]	30	-20	A
P_D@T_A=25℃	Total Power Dissipation	2.0		W
	Linear Derating Factor	0.016		W/℃
T_{STG}	Storage Temperature Range	-55 to 150		℃
T_J	Operating Junction Temperature Range	-55 to 150		℃

THERMAL DATA

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	62.5	℃/W

N-CH Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	20	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=9A	-	-	16	mΩ
		V_{GS}=4.5V, I_D=8.3A	-	-	18	mΩ
		V_{GS}=2.5V, I_D=5.2A	-	-	30	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.5	-	-	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=8.3A	-	8.3	-	S
I_{DSS}	Drain-Source Leakage Current (T_j=25°C)	V_{DS}=20V, V_{GS}=0V	-	-	1	uA
	Drain-Source Leakage Current (T_j=70°C)	V_{DS}=16V ,V_{GS}=0V	-	-	25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±12V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=8A	-	22	-	nC
Q_{gs}	Gate-Source Charge	V_{DS}=16V	-	3	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	9	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=10V	-	11	-	ns
t_r	Rise Time	I_D=1A	-	13	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω,V_{GS}=5V	-	30	-	ns
t_f	Fall Time	R_D=10Ω	-	14	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	1350	-	pF
C_{oss}	Output Capacitance	V_{DS}=20V	-	325	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	255	-	pF

SOURCE-DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=1.8A, V_{GS}=0V	-	-	1.2	V
t_{rr}	Reverse Recovery Time[2]	I_S=8A, V_{GS}=0V,	-	32	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	24	-	nC

P-CH Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-20	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V, I_D=-6A	-	-	40	mΩ
		V_{GS}=-4.5V, I_D=-5A	-	-	45	mΩ
		V_{GS}=-2.5V, I_D=-4A	-	-	80	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-0.5	-	-	V
g_{fs}	Forward Transconductance	V_{DS}=-10V, I_D=-2.2A	-	2.2	-	S
I_{DSS}	Drain-Source Leakage Current (T_j=25°C)	V_{DS}=-20V, V_{GS}=0V	-	-	-1	uA
	Drain-Source Leakage Current (T_j=70°C)	V_{DS}=-16V, V_{GS}=0V	-	-	-25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±12V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=-5A	-	13	-	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-16V	-	1.5	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-4.5V	-	4.5	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=-10V	-	8	-	ns
t_r	Rise Time	I_D=-1A	-	17	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω,V_{GS}=-5V	-	24	-	ns
t_f	Fall Time	R_D=10Ω	-	36	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	920	-	pF
C_{oss}	Output Capacitance	V_{DS}=-20V	-	90	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	85	-	pF

SOURCE-DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	30
V_{SD}	Forward On Voltage[2]	I_S=-1.8A, V_{GS}=0V	-	-	-1.2	V
t_{rr}	Reverse Recovery Time	I_S=-5A, V_{GS}=0V,	-	28	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	16	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 copper pad of FR4 board ; 135 ℃/W when mounted on Min. copper pad.

N-Channel

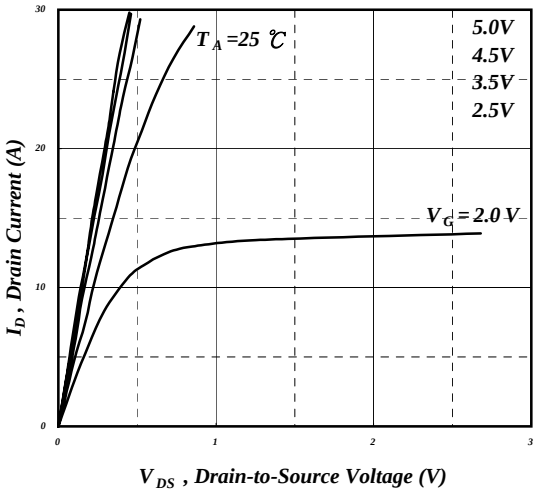


Fig 1. Typical Output Characteristics

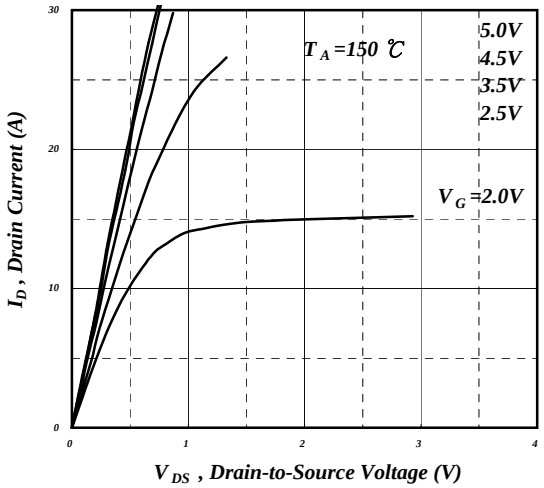


Fig 2. Typical Output Characteristics

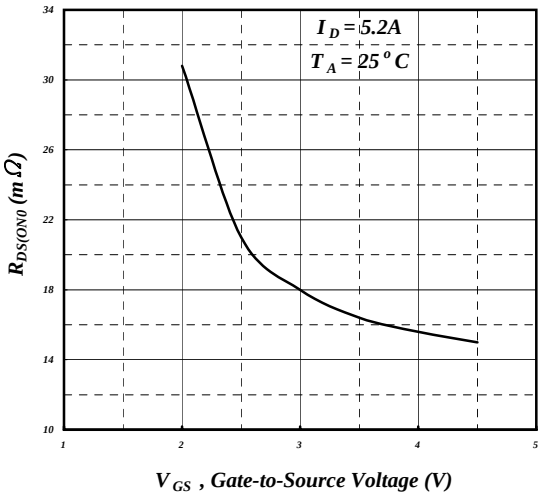


Fig 3. On-Resistance v.s. Gate Voltage

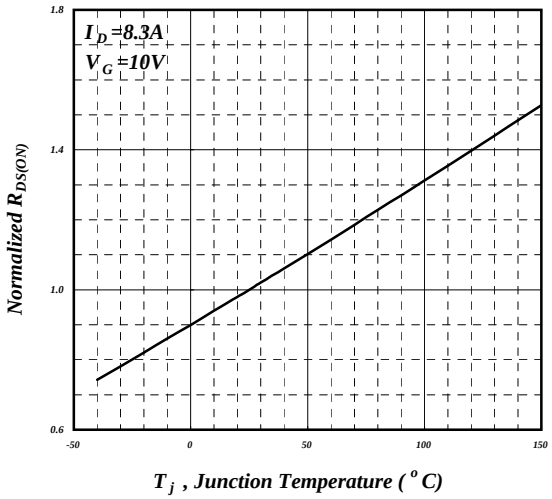


Fig 4. Normalized On-Resistance v.s. Junction Temperature

N-Channel

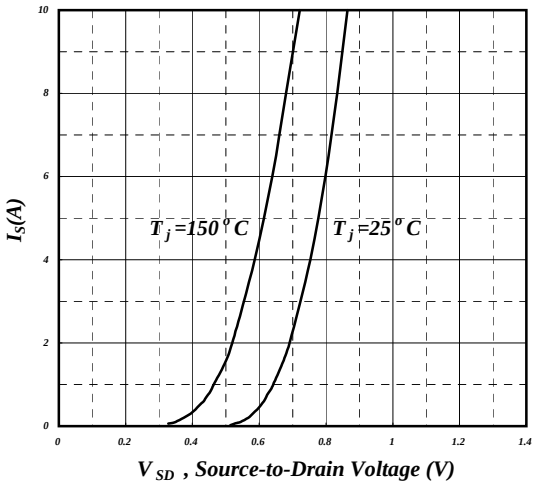


Fig 5. Forward Characteristic of Reverse Diode

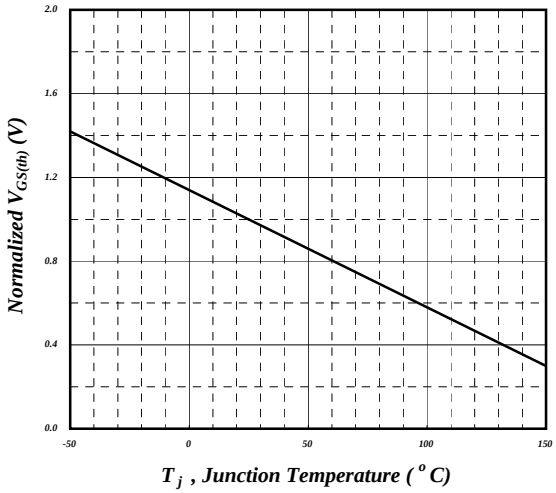


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

N-Channel

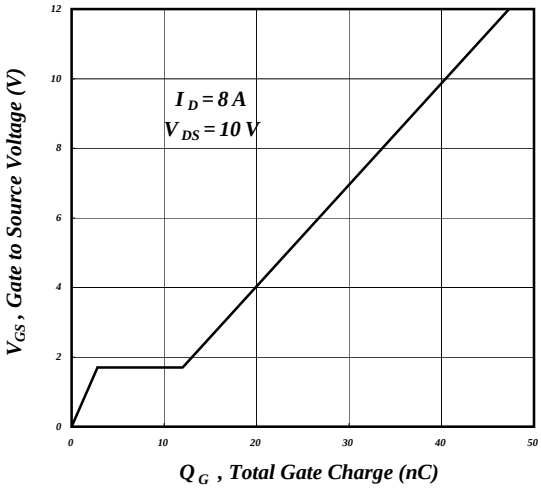


Fig 7. Gate Charge Characteristics

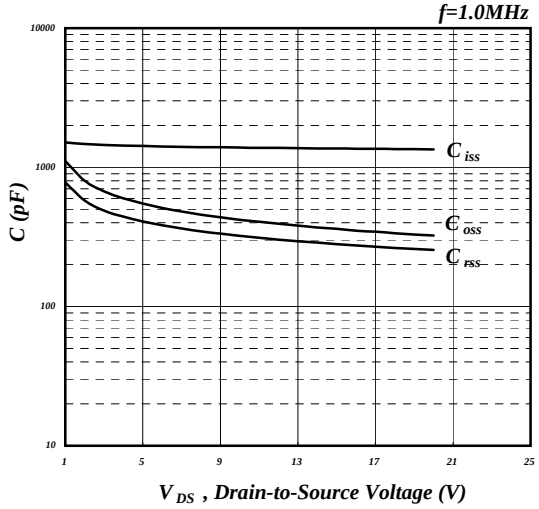


Fig 8. Typical Capacitance Characteristics

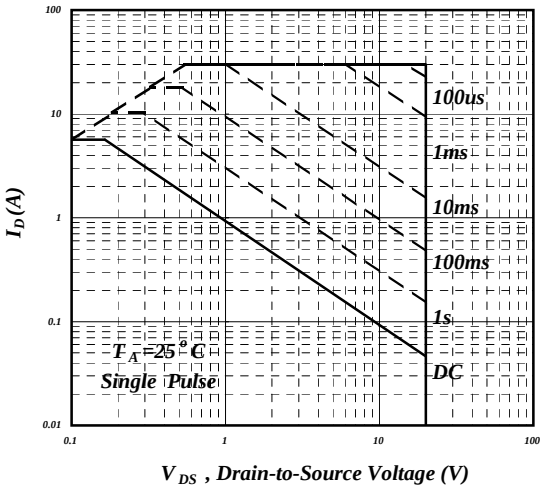


Fig 9. Maximum Safe Operating Area

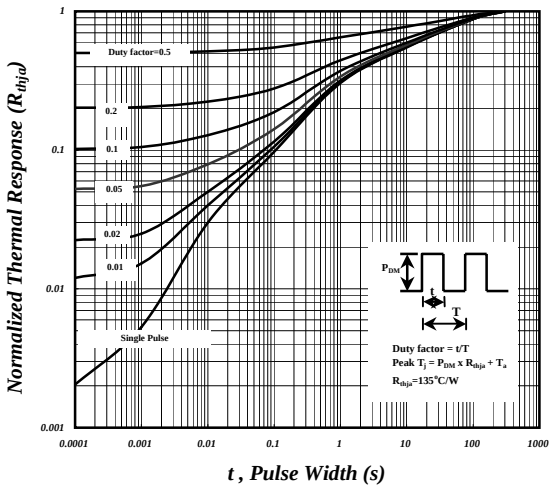


Fig 10. Effective Transient Thermal Impedance

N-Channel

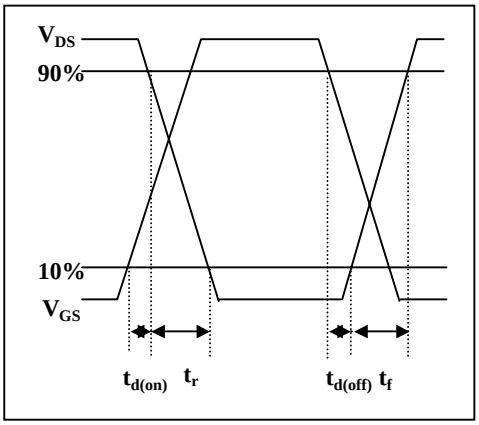


Fig 11. Switching Time Waveform

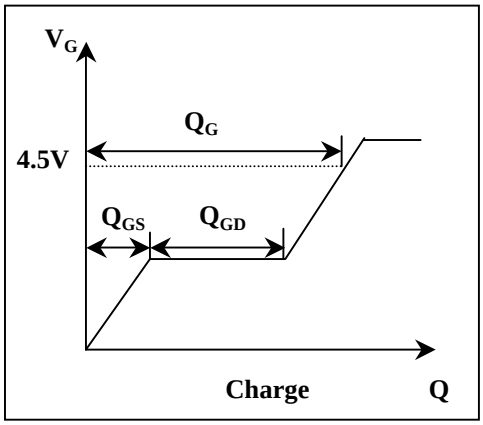


Fig 12. Gate Charge Waveform

P-Channel

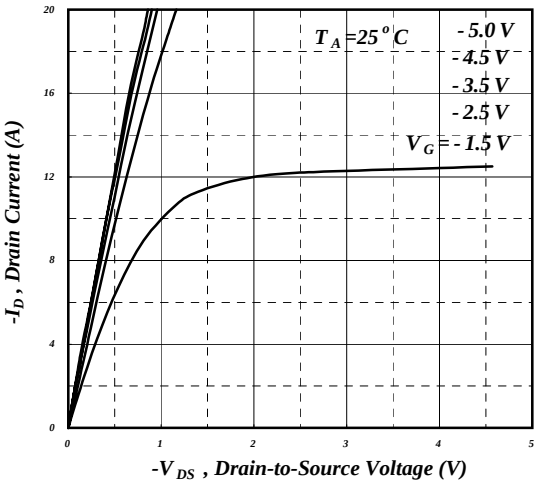


Fig 1. Typical Output Characteristics

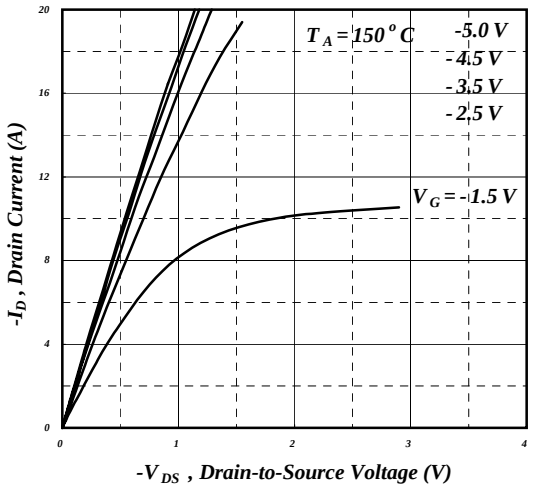


Fig 2. Typical Output Characteristics

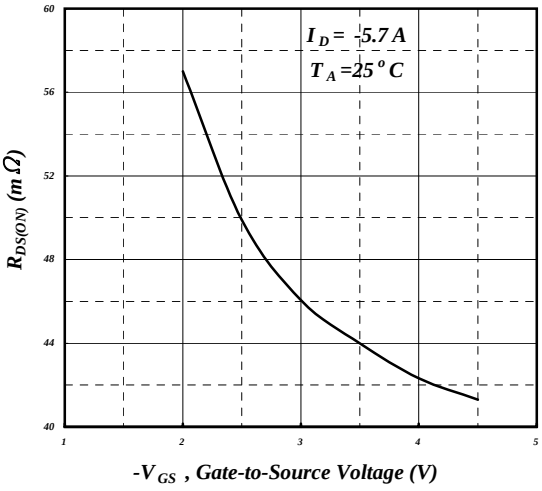


Fig 3. On-Resistance v.s. Gate Voltage

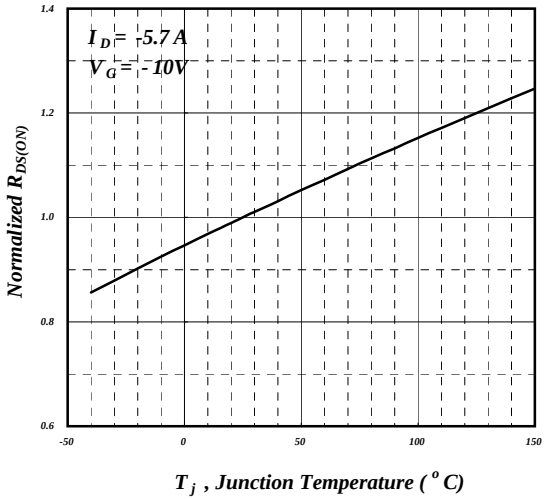


Fig 4. Normalized On-Resistance v.s. Junction Temperature

P-Channel

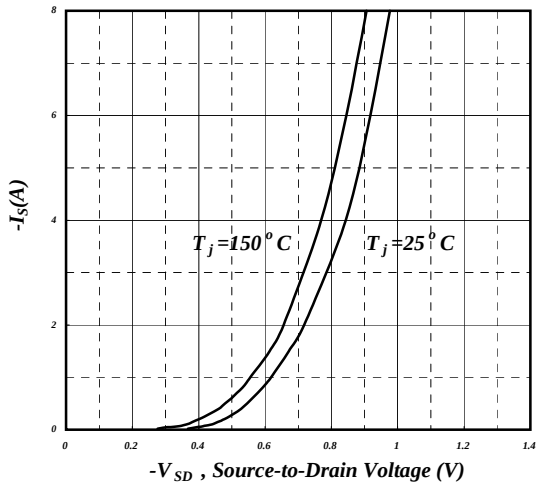


Fig 5. Forward Characteristic of Reverse Diode

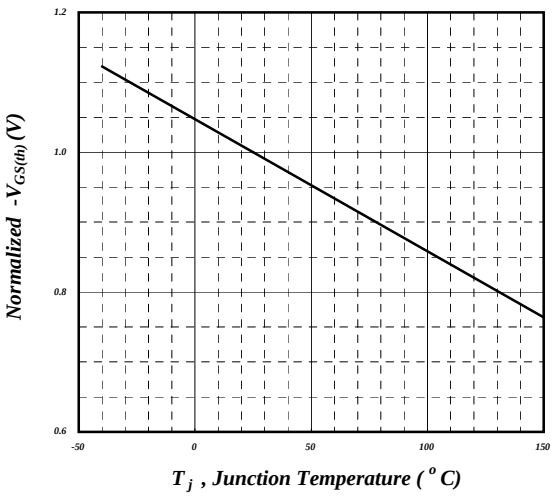


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

P-Channel

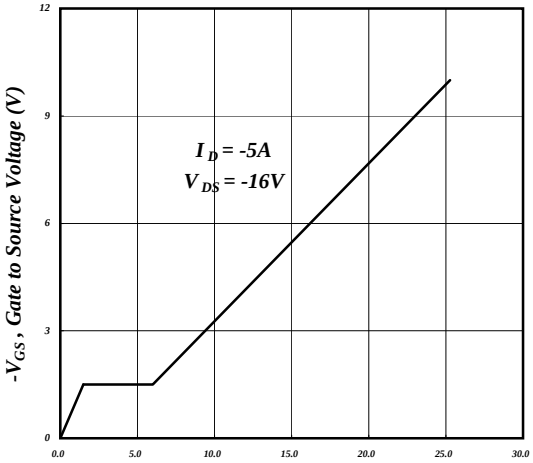


Fig 7. Gate Charge Characteristics

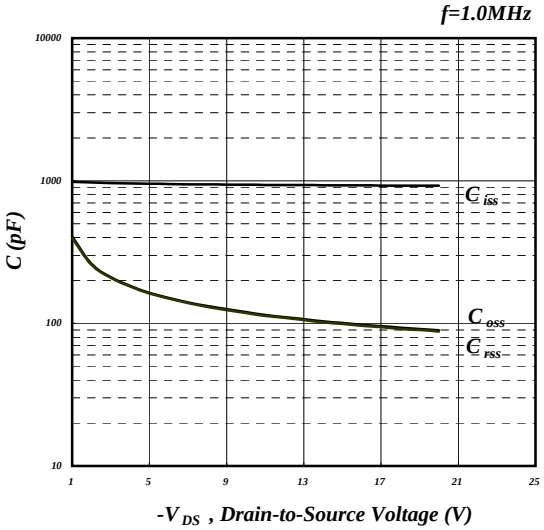


Fig 8. Typical Capacitance Characteristics

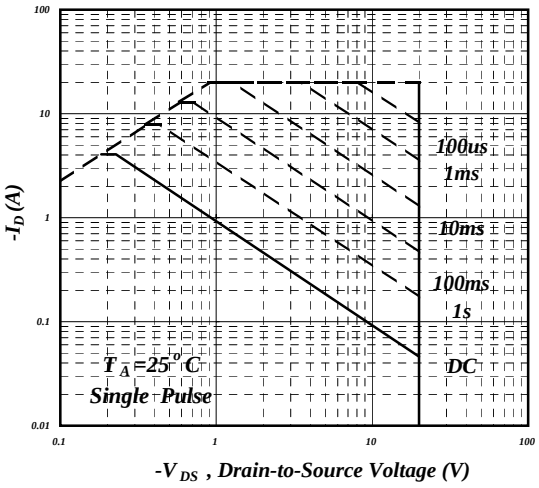


Fig 9. Maximum Safe Operating Area

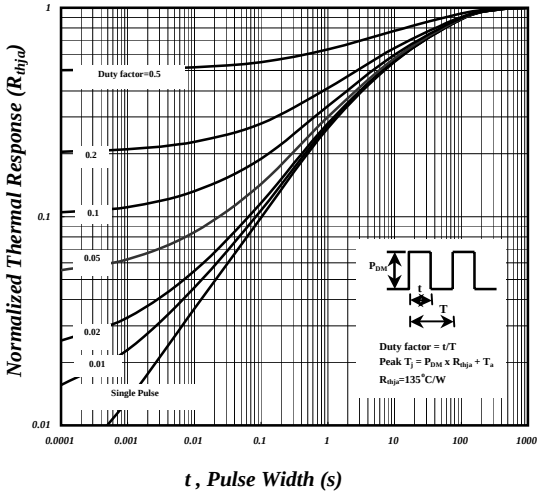


Fig 10. Effective Transient Thermal Impedance

P-Channel

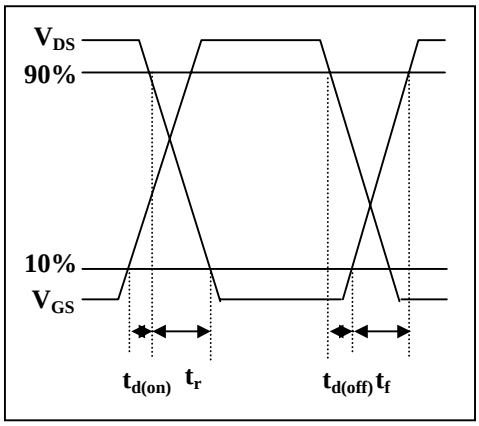


Fig 11. Switching Time Waveform

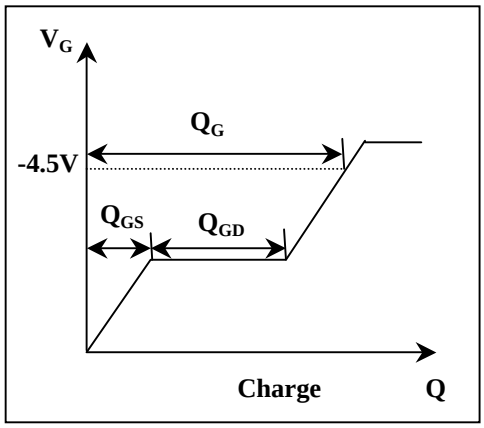
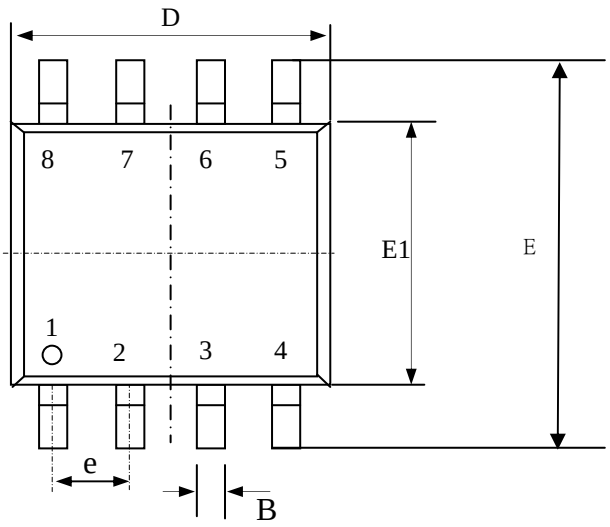
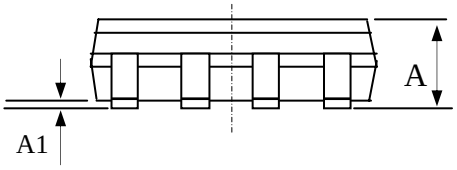


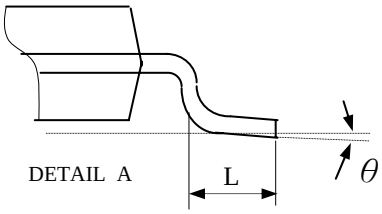
Fig 12. Gate Charge Waveform

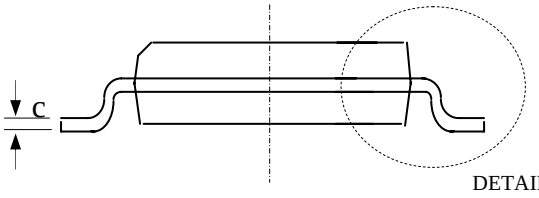
Package Outline : SO-8



	Millimeters		
SYMBOLS	MIN	NOM	MAX
A	1.35	1.55	1.75
A1	0.10	0.18	0.25
B	0.33	0.41	0.51
C	0.19	0.22	0.25
D	4.80	4.90	5.00
E1	3.80	3.90	4.00
E	5.80	6.15	6.50
L	0.38	0.71	1.27
θ	0	4.00	8.00
e	1.27 TYP		







1.All Dimension Are In Millimeters.

2.Dimension Does Not Include Mold Protrusions.

Part Marking Information & Packing : SO-8