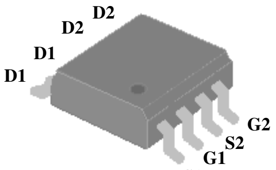
AP4530GM

RoHS-compliant Product

**Advanced Power
Electronics Corp.**

*N AND P-CHANNEL ENHANCEMENT
MODE POWER MOSFET*

- ▼ **Simple Drive Requirement**
- ▼ **Fast Switching Performance**
- ▼ **Lower Gate Charge**



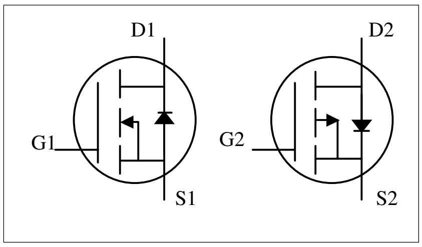
SO-8

N-CH	BV_{DSS}	40V
	$R_{DS(ON)}$	36mΩ
	I_D	5.7A
P-CH	BV_{DSS}	-40V
	$R_{DS(ON)}$	68mΩ
	I_D	-4.2A

Description

Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

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



Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		N-channel	P-channel	
V_{DS}	Drain-Source Voltage	40	-40	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D@T_A=25℃	Continuous Drain Current[3]	5.7	-4.2	A
I_D@T_A=70℃	Continuous Drain Current[3]	4.5	-3.4	A
I_{DM}	Pulsed Drain Current[1]	20	-20	A
P_D@T_A=25℃	Total Power Dissipation	2		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^{o}C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	40	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance^2	V_{GS}=10V, I_D=5A	-	-	36	mΩ
		V_{GS}=4.5V, I_D=3A	-	-	50	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	-	3	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=5A	-	5	-	S
I_{DSS}	Drain-Source Leakage Current (T_j=25^{o}C)	V_{DS}=40V, V_{GS}=0V	-	-	10	uA
	Drain-Source Leakage Current (T_j=70^{o}C)	V_{DS}=32V, V_{GS}=0V	-	-	25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V	-	-	±100	nA
Q_g	Total Gate Charge^2	I_D=5A	-	7	12	nC
Q_{gs}	Gate-Source Charge	V_{DS}=30V	-	1.2	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	3.4	-	nC
$t_{d(on)}$	Turn-on Delay Time^2	V_{DS}=20V	-	4	-	ns
t_r	Rise Time	I_D=1A	-	9	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω,V_{GS}=10V	-	18	-	ns
t_f	Fall Time	R_D=20Ω	-	4	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	380	610	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	70	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	55	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage^2	I_S=1.5A, V_{GS}=0V	-	-	1.3	V
t_{rr}	Reverse Recovery Time	I_S=5A, V_{GS}=0V	-	19	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/µs	-	13	-	nC

P-CH Electrical Characteristics@T_j=25^{o}C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-40	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance^2	V_{GS}=-10V, I_D=-3A	-	-	68	mΩ
		V_{GS}=-4.5V, I_D=-2A	-	-	100	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-1	-	-3	V
g_{fs}	Forward Transconductance	V_{DS}=-10V, I_D=-4A	-	4	-	S
I_{DSS}	Drain-Source Leakage Current (T_j=25^{o}C)	V_{DS}=-40V, V_{GS}=0V	-	-	-10	uA
	Drain-Source Leakage Current (T_j=70^{o}C)	V_{DS}=-32V, V_{GS}=0V	-	-	-25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V	-	-	±100	nA
Q_g	Total Gate Charge^2	I_D=-3A	-	8	13	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-30V	-	1.6	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-4.5V	-	4.3	-	nC
$t_{d(on)}$	Turn-on Delay Time^2	V_{DS}=-20V	-	6	-	ns
t_r	Rise Time	I_D=-1A	-	6	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω,V_{GS}=-10V	-	24	-	ns
t_f	Fall Time	R_D=20Ω	-	7	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	605	970	pF
C_{oss}	Output Capacitance	V_{DS}=-25V	-	75	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	65	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage^2	I_S=-1.5A, V_{GS}=0V	-	-	-1.3	V
t_{rr}	Reverse Recovery Time	I_S=-3A, V_{GS}=0V	-	21	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=-100A/µs	-	15	-	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 , t ≤10sec ; 135℃/W when mounted on min. copper pad.

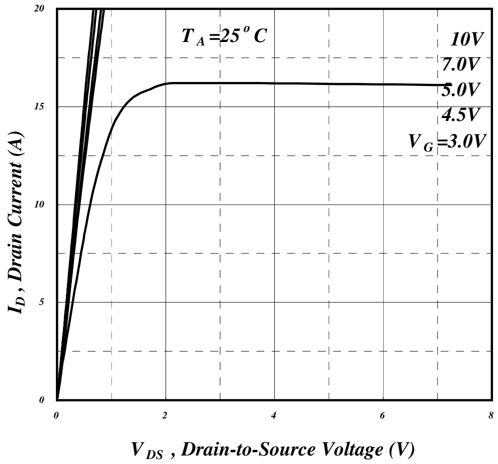


Fig 1. Typical Output Characteristics

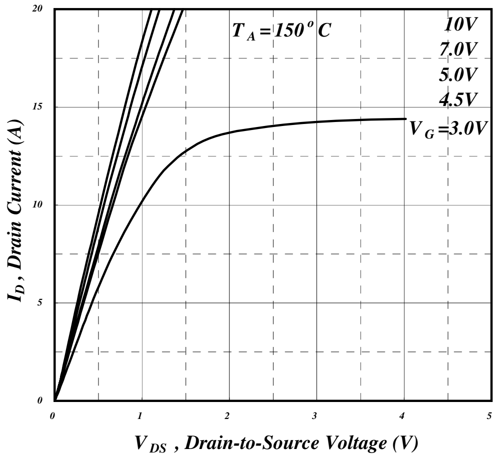


Fig 2. Typical Output Characteristics

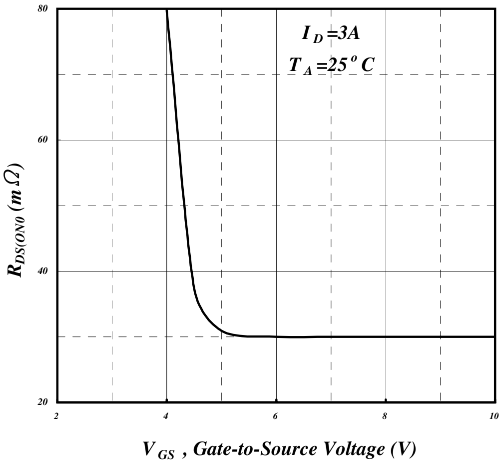


Fig 3. On-Resistance v.s. Gate Voltage

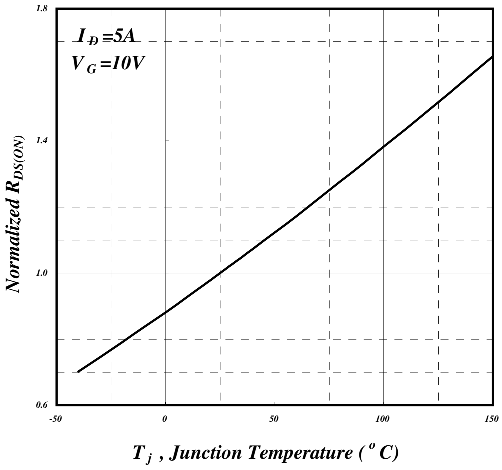


Fig 4. Normalized On-Resistance v.s. Junction Temperature

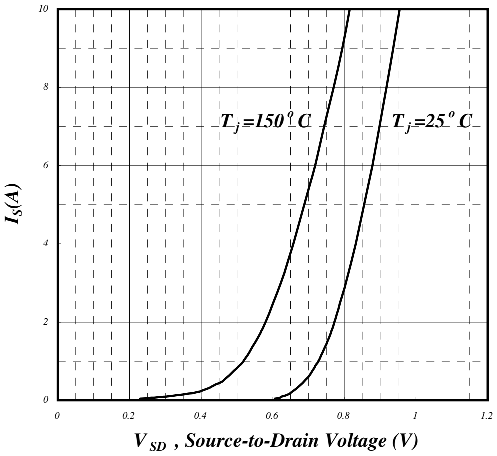


Fig 5. Forward Characteristic of Reverse Diode

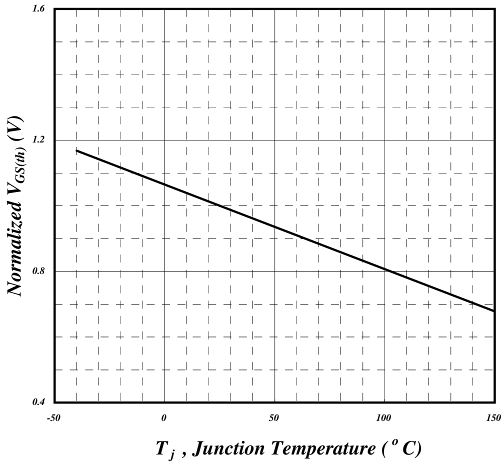


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

N-Channel

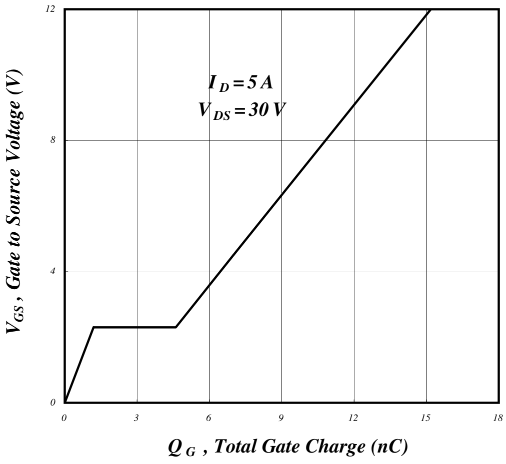


Fig 7. Gate Charge Characteristics

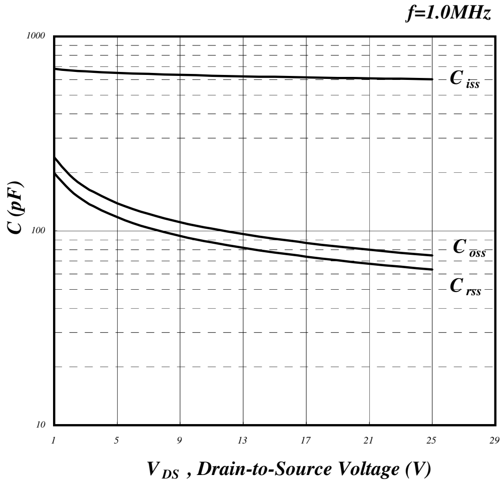


Fig 8. Typical Capacitance Characteristics

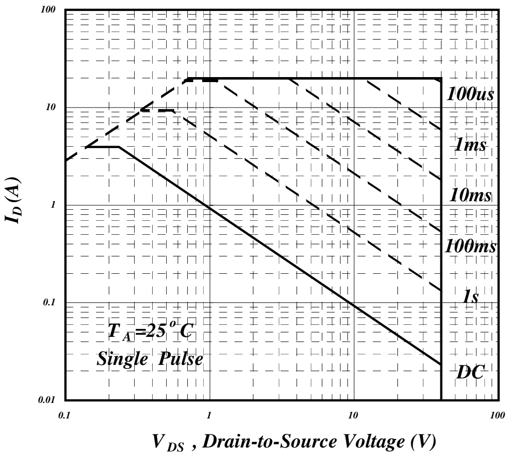


Fig 9. Maximum Safe Operating Area

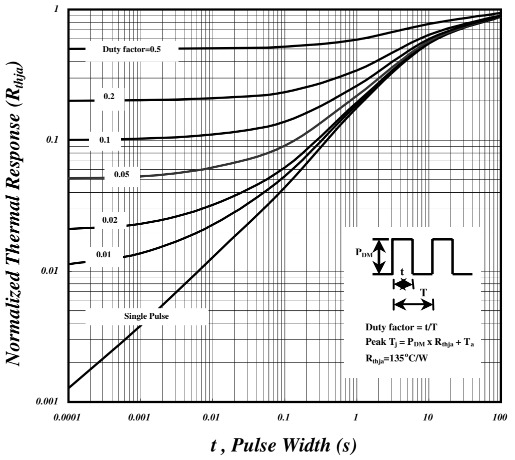


Fig 10. Effective Transient Thermal Impedance

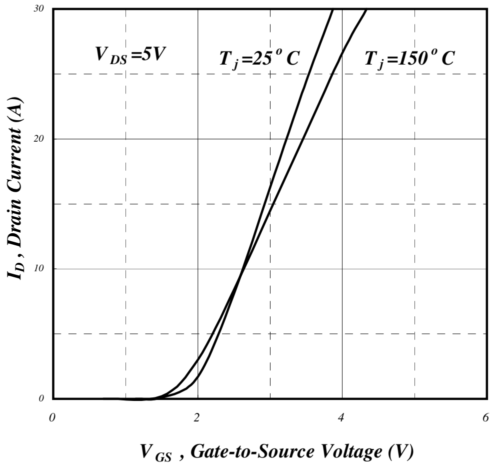


Fig 11. Transfer Characteristics

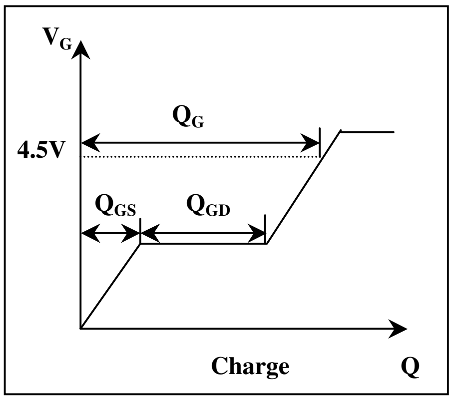


Fig 12. Gate Charge Waveform

P-Channel

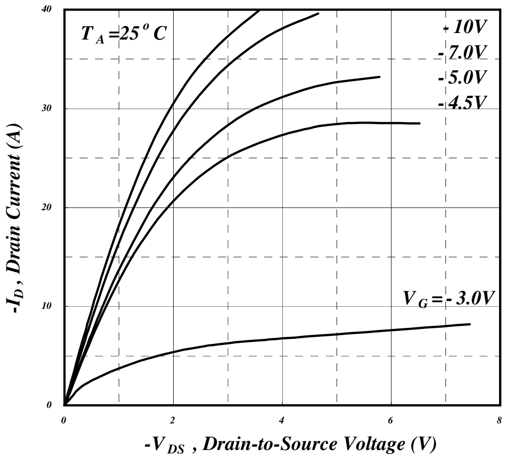


Fig 1. Typical Output Characteristics

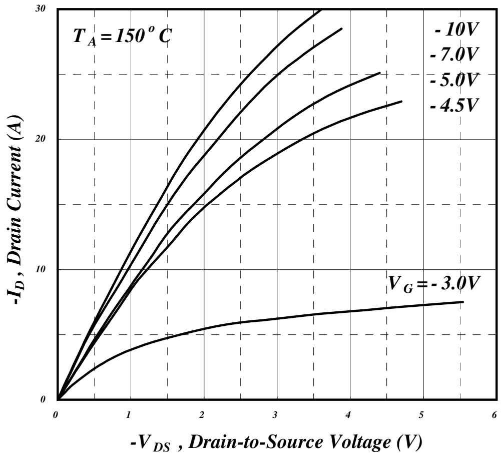


Fig 2. Typical Output Characteristics

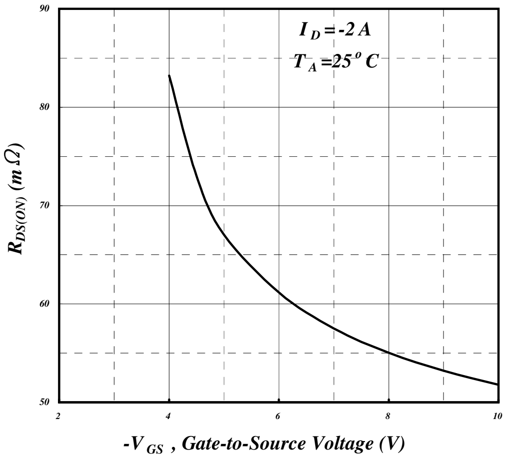


Fig 3. On-Resistance v.s. Gate Voltage

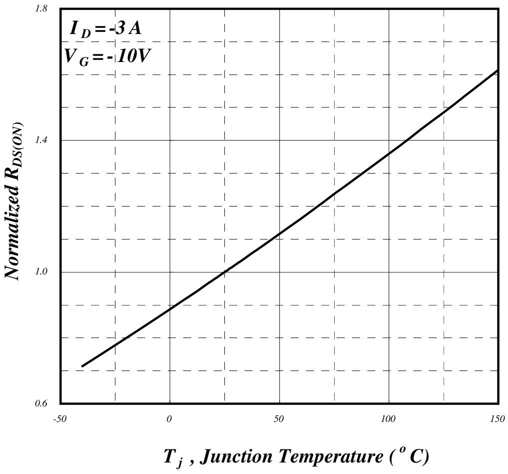


Fig 4. Normalized On-Resistance
v.s. Junction Temperature

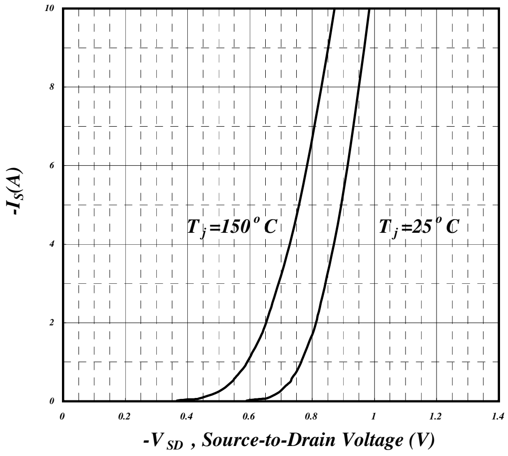


Fig 5. Forward Characteristic of
Reverse Diode

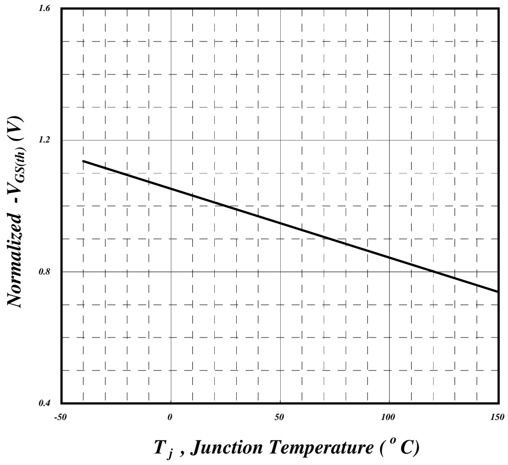


Fig 6. Gate Threshold Voltage v.s.
Junction Temperature

P-Channel

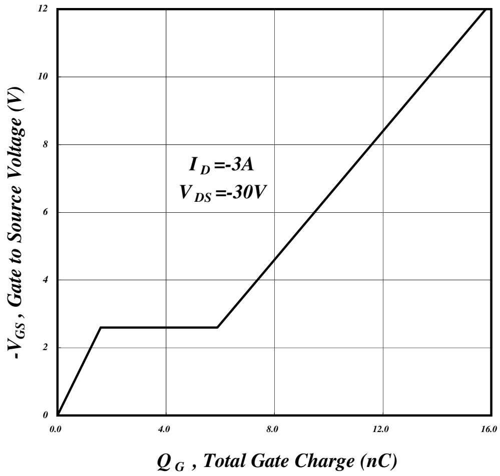


Fig 7. Gate Charge Characteristics

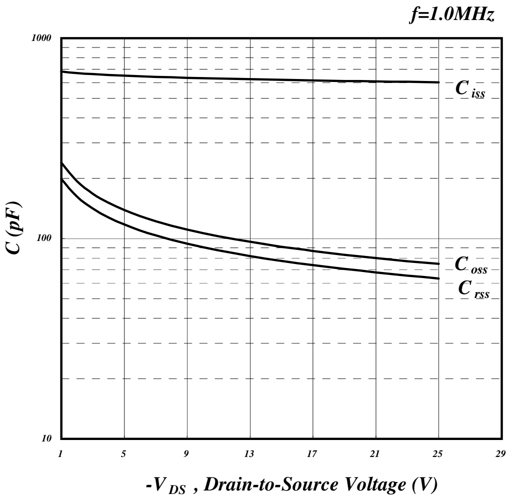


Fig 8. Typical Capacitance Characteristics

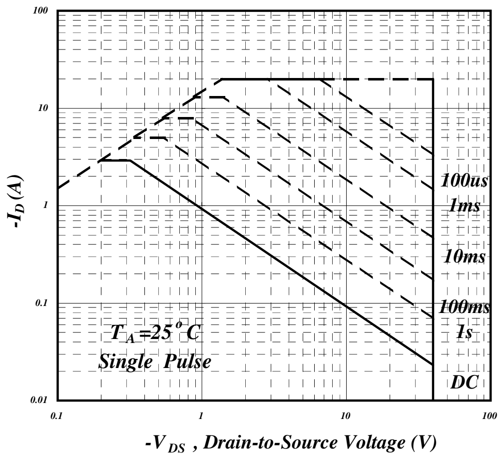


Fig 9. Maximum Safe Operating Area

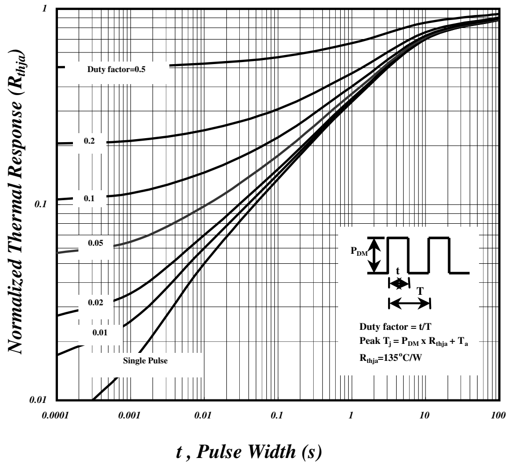


Fig 10. Effective Transient Thermal Impedance

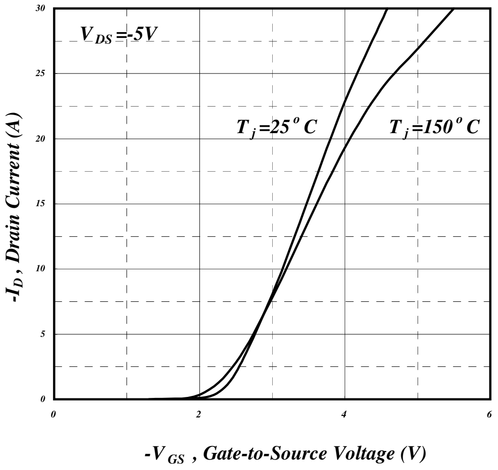


Fig 11. Transfer Characteristics

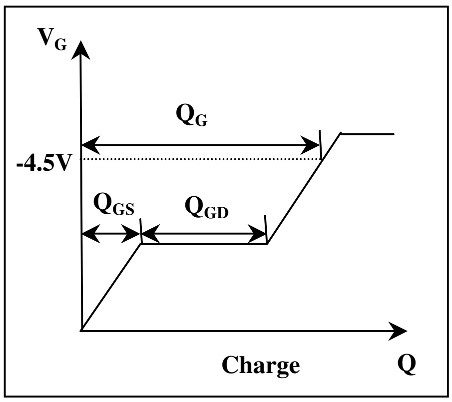
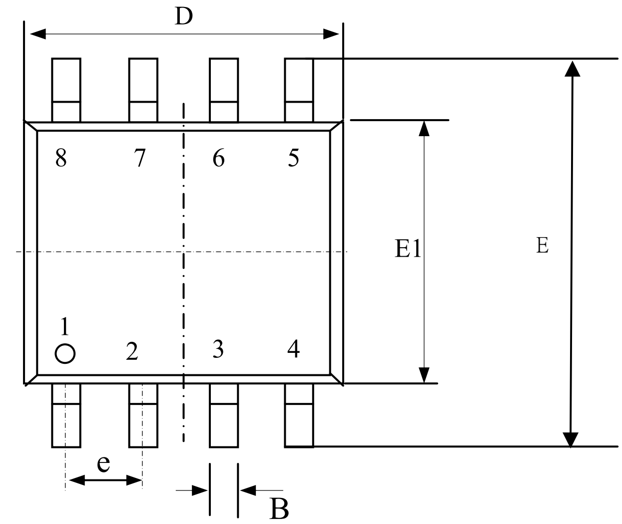
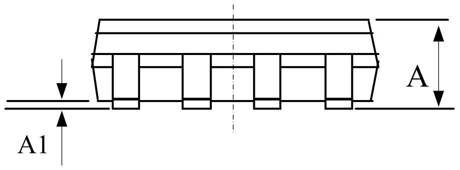


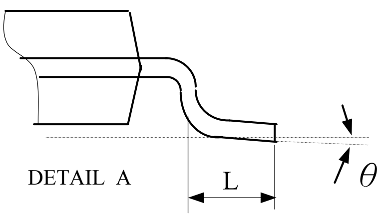
Fig 12. Gate Charge Waveform

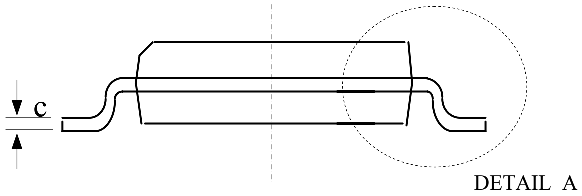
Package Outline : SO-8



SYMBOLS	Millimeters		
	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		



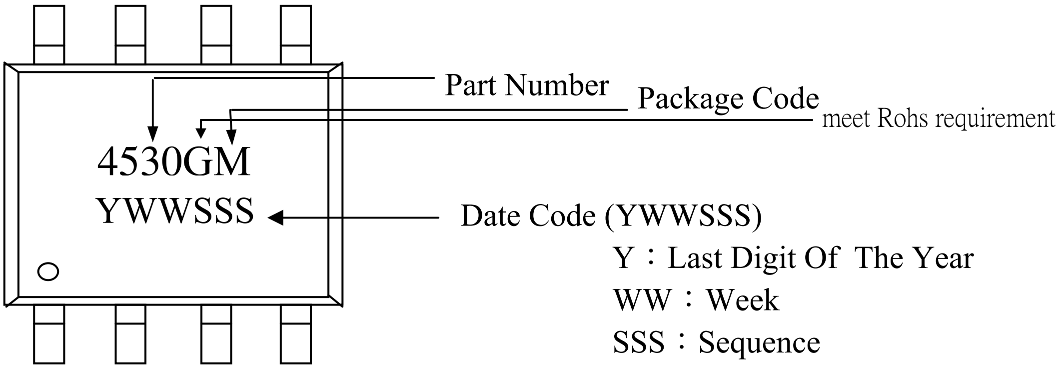




1.All Dimension Are In Millimeters.

2.Dimension Does Not Include Mold Protrusions.

Part Marking Information & Packing : SO-8



Y：Last Digit Of The Year
WW：Week
SSS：Sequence