

General Description

The AGM628MA combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

This device is ideal for load switch and battery protection applications.

Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance
- 100% Avalanche tested
- 100% DVDS tested

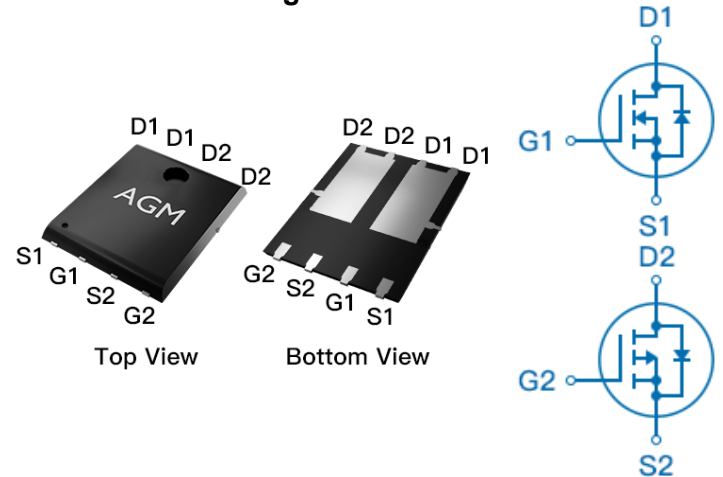
Application

- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

Product Summary

BVDSS	RDSON	ID
60V	28mΩ	25A
-60V	41mΩ	-25A

PDFN5*6 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM628MA	AGM628MA	PDFN5*6	330mm	12mm	3000

Table 1. Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$)

Symbol	Parameter	Rating		Units
		N-Ch	P-Ch	
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	60	-60	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	± 20	V
I_D	Drain Current-Continuous($T_c=25^{\circ}\text{C}$) (Note 1)	25	-25	A
	Drain Current-Continuous($T_c=100^{\circ}\text{C}$)	16	-16	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	100	-100	A
P_D	Total Power Dissipation($T_c=25^{\circ}\text{C}$)	35	35	W
	Total Power Dissipation($T_c=100^{\circ}\text{C}$)	13.8	13.8	W
EAS	Avalanche energy (Note 3)	44	53	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	-55 To 150	$^{\circ}\text{C}$

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State) ¹	---	62	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	3.6	$^{\circ}\text{C/W}$

Table 3. N- Channel Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	60	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=60V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.2	1.5	2.2	V
gFS	Forward Transconductance	VDS=5V,ID=10A	--	14	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=15A	--	28	33	mΩ
		VGS=4.5V, ID=10A	--	34.2	39	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=30V,VGS=0V, F=1MHZ	--	852	--	pF
Coss	Output Capacitance		--	44	--	pF
Crss	Reverse Transfer Capacitance		--	41	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	1.5	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=30V, RL=2.5Ω,RGEN=3Ω	--	4.5	--	nS
tr	Turn-on Rise Time		--	18	--	nS
td(off)	Turn-Off Delay Time		--	14.5	--	nS
tf	Turn-Off Fall Time		--	18	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=30V, ID=3A	--	19	--	nC
Qgs	Gate-Source Charge		--	4.2	--	nC
Qgd	Gate-Drain Charge		--	2.5	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	25	A
VSD	Forward on Voltage	VGS=0V,IS=15A	--	0.8	1.2	V
trr	Reverse Recovery Time	IF=15A , dI/dt=100A/μs , TJ=25℃	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	nc

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: T_J=25°C

Table 3. P-Channel Electrical Characteristics (TJ=25°C unless otherwise noted)

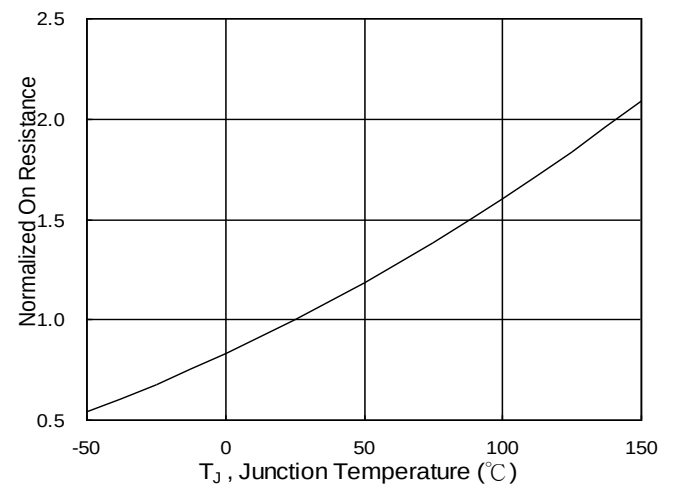
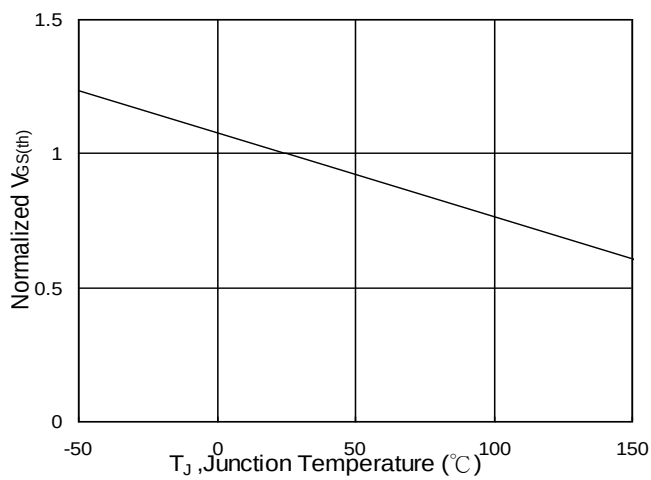
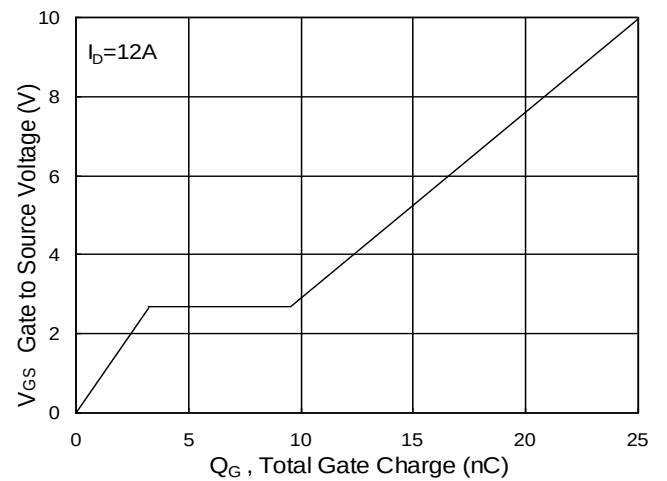
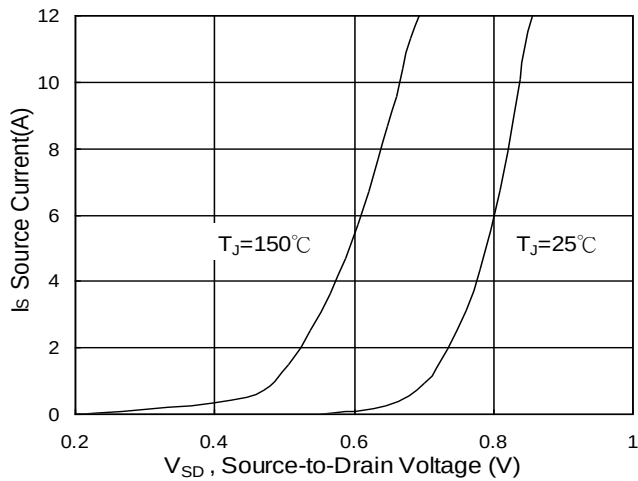
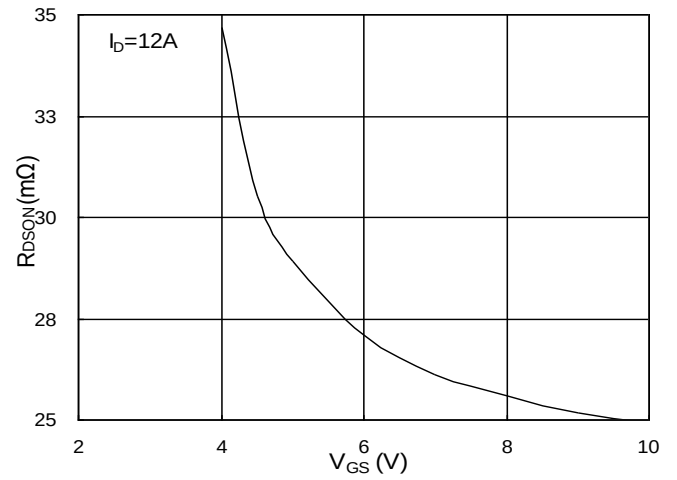
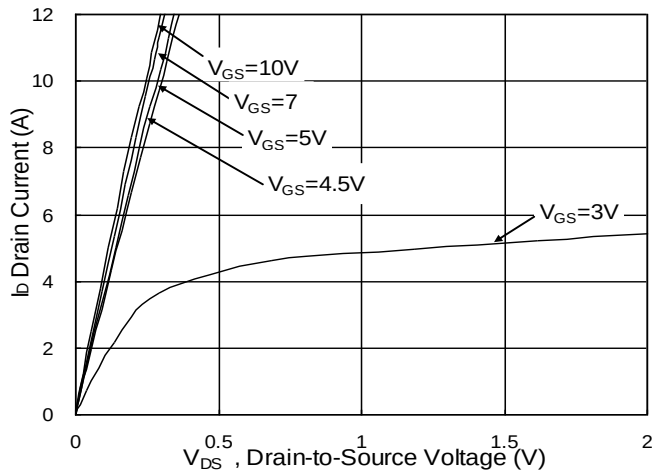
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=-250μA	-60	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=-60V,VGS=0V	--	--	-1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-1.2	-1.8	-2.2	V
gFS	Forward Transconductance	VDS=-5V,ID=-10A	--	11	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-10V, ID=-15A	--	41	60	mΩ
		VGS=-4.5V, ID=-10A	--	52.2	88	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=-30V,VGS=0V, F=1MHZ	--	716	--	pF
Coss	Output Capacitance		--	105	--	pF
Crss	Reverse Transfer Capacitance		--	9.4	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	4.1	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=-10V,VDS=-30V, RGEN=3Ω	--	10	--	nS
tr	Turn-on Rise Time		--	6.0	--	nS
td(off)	Turn-Off Delay Time		--	40	--	nS
tf	Turn-Off Fall Time		--	13	--	nS
Qg	Total Gate Charge	VGS=-10V, VDS=-30V, ID=-3A	--	25	--	nC
Qgs	Gate-Source Charge		--	5.8	--	nC
Qgd	Gate-Drain Charge		--	3.1	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	-25	A
VSD	Forward on Voltage	VGS=0V,IS=-15A	--	-0.8	-1.2	V
trr	Reverse Recovery Time	IF=-15A , dI/dt=100A/μs , TJ=25℃	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	nc

Notes 1.The maximum current rating is package limited.

Notes2.Repetitive Rating: Pulsewidth limited by maximum junction temperature Notes

3.EAS condition: TJ=25°C

N-Channel Typical Characteristics



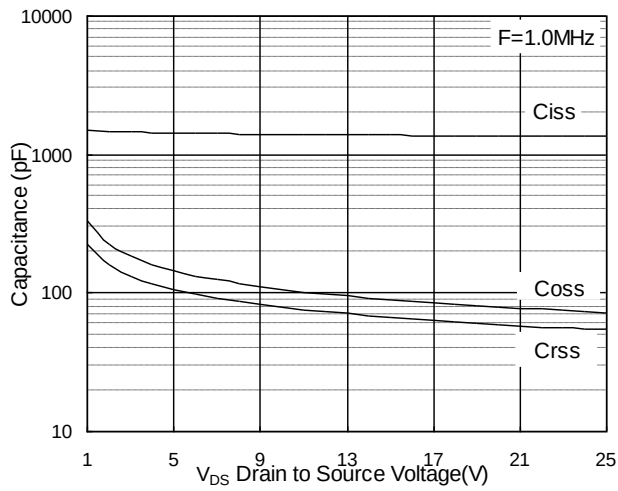


Fig.7 Capacitance

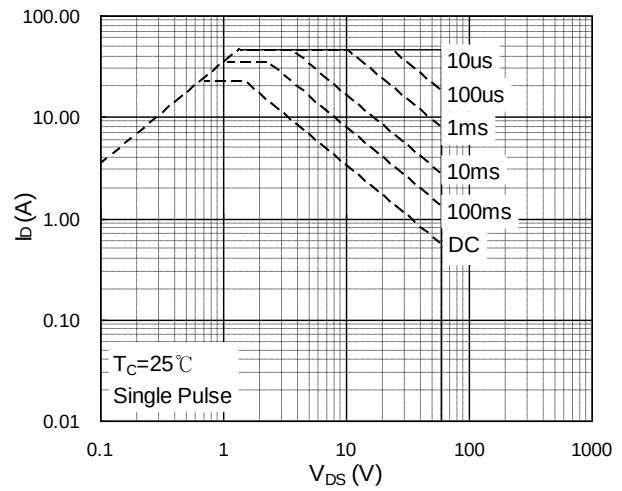


Fig.8 Safe Operating Area

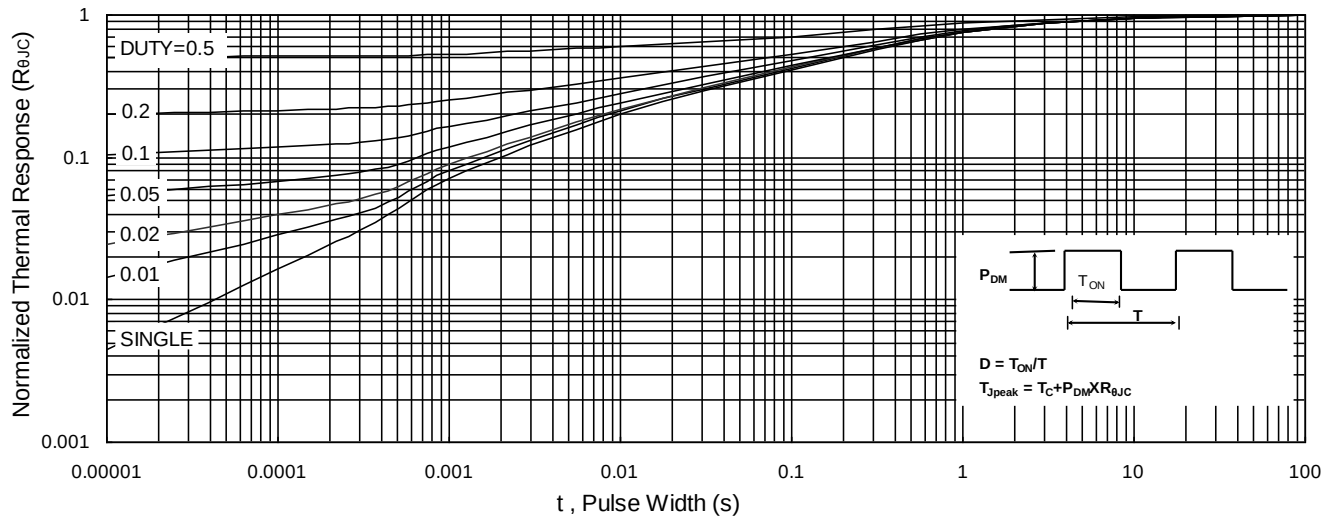


Fig.9 Normalized Maximum Transient Thermal Impedance

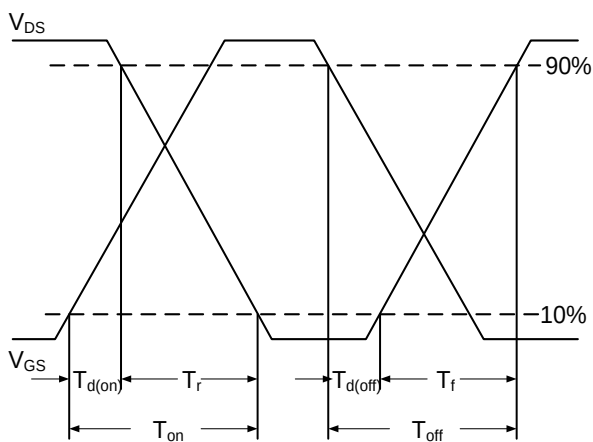


Fig.10 Switching Time Waveform

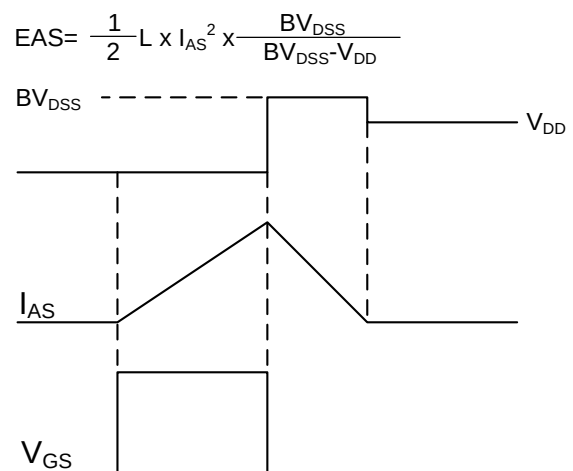


Fig.11 Unclamped Inductive Waveform

P-Channel Typical Characteristics

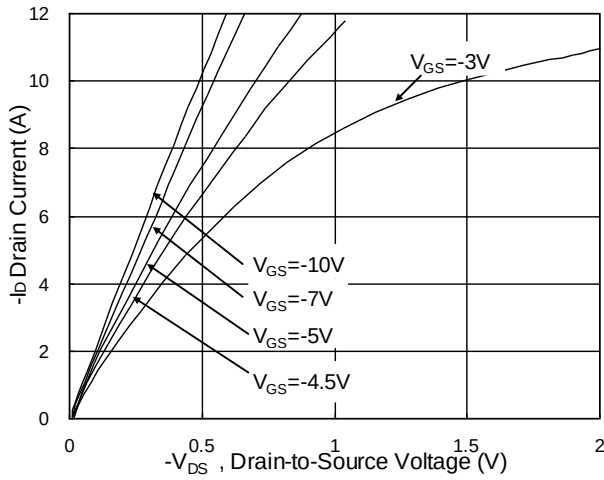


Fig.1 Typical Output Characteristics

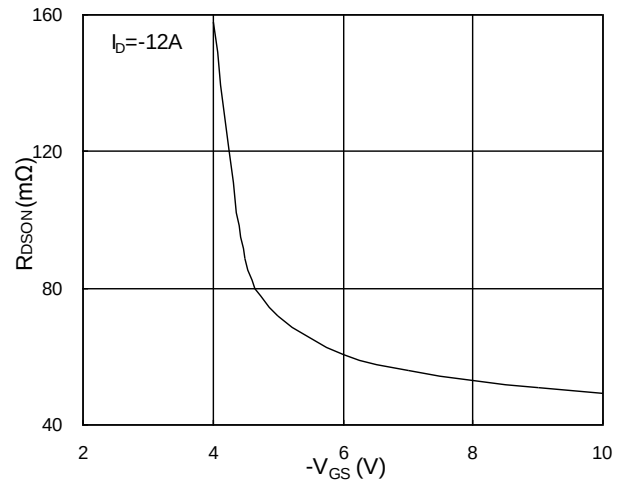


Fig.2 On-Resistance v.s Gate-Source

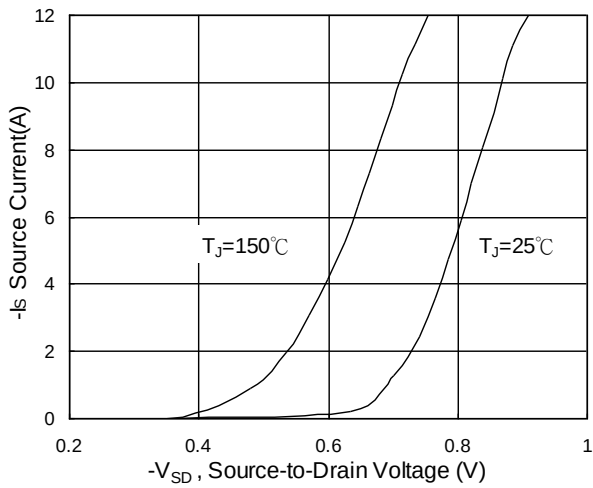


Fig.3 Forward Characteristics of Reverse

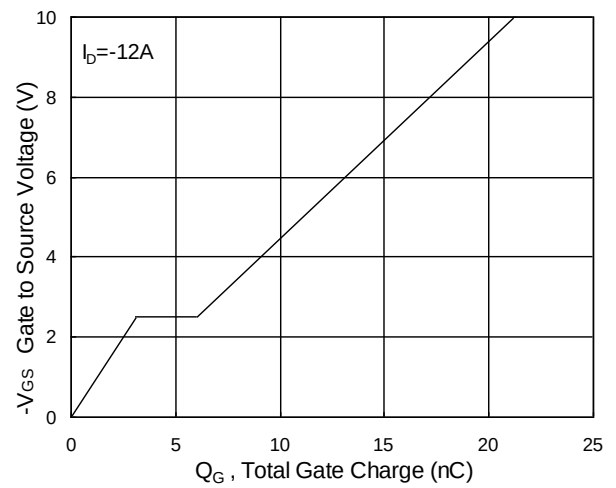


Fig.4 Gate-Charge Characteristics

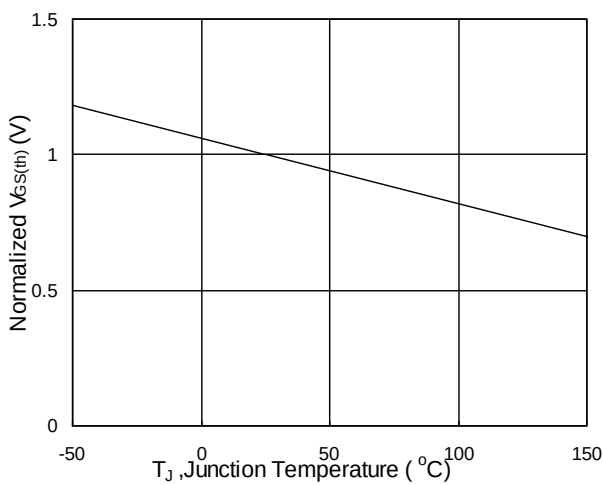


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

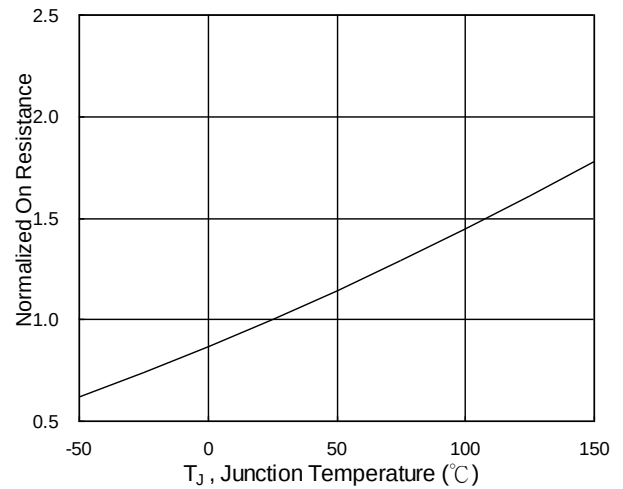


Fig.6 Normalized $R_{DS(on)}$ v.s T_J

P-Channel Typical Characteristics

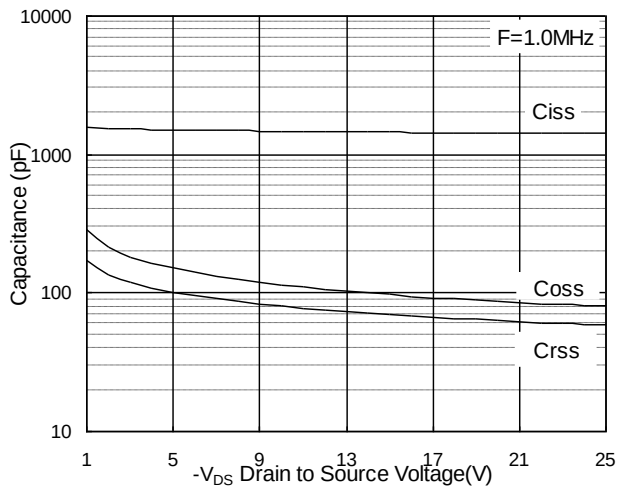


Fig.7 Capacitance

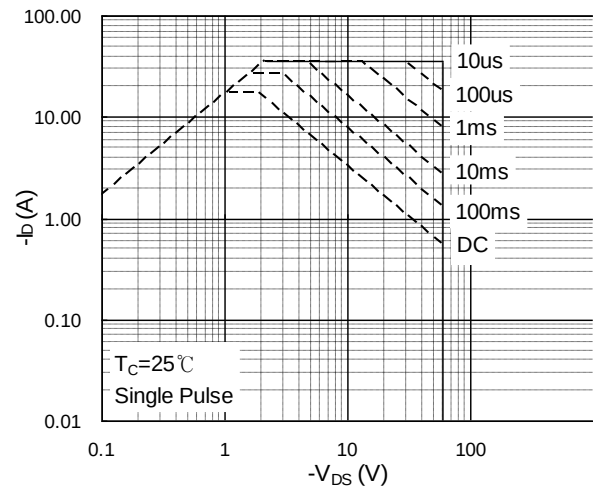


Fig.8 Safe Operating Area

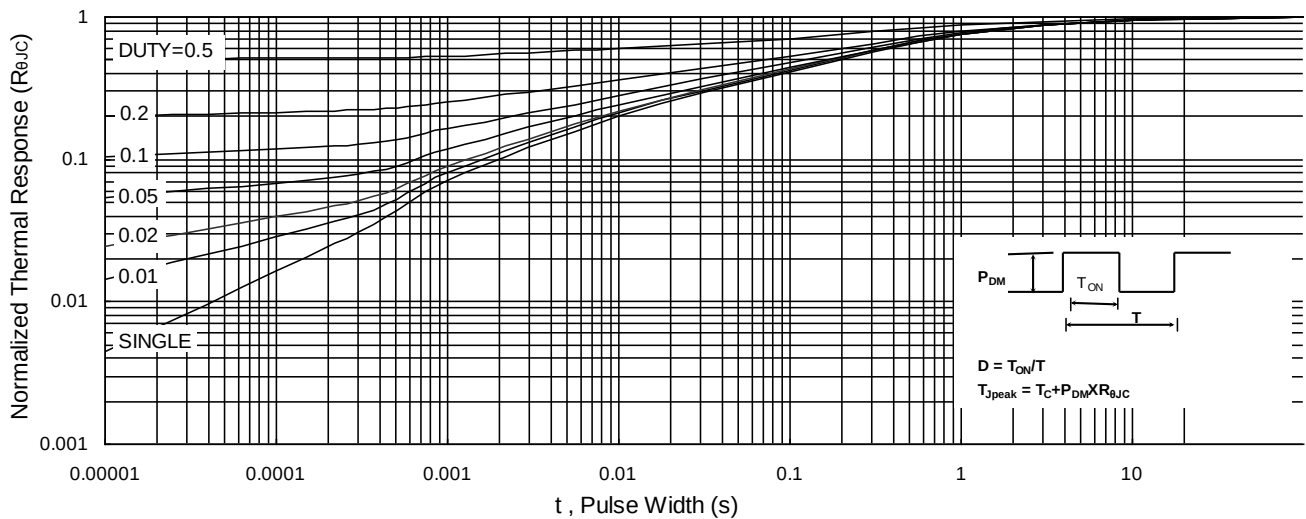


Fig.9 Normalized Maximum Transient Thermal Impedance

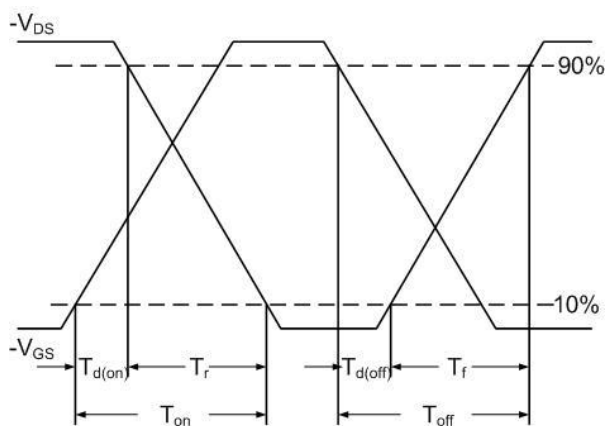


Fig.10 Switching Time Waveform

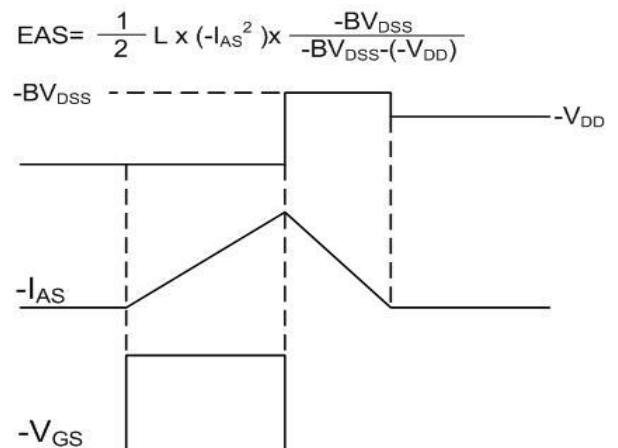
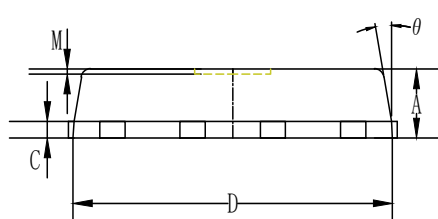
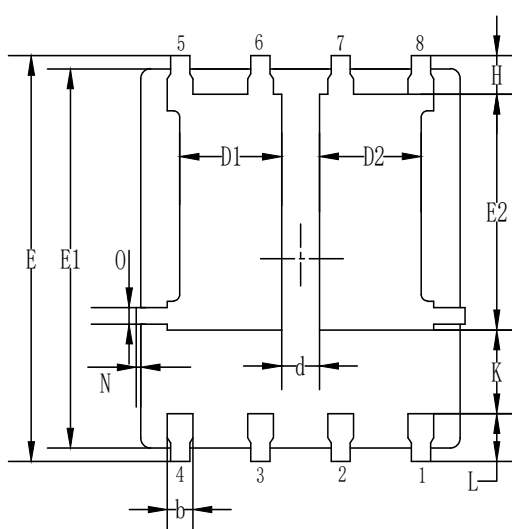
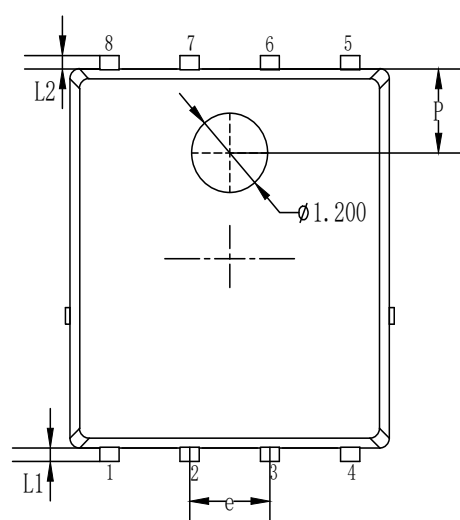
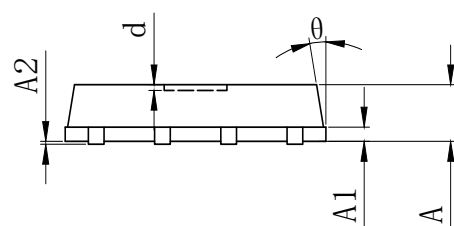
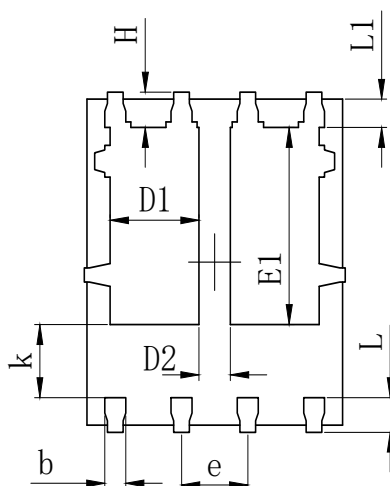
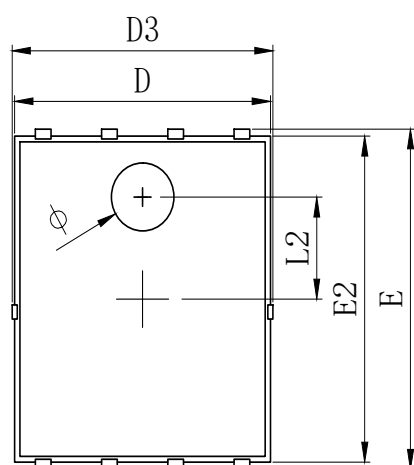


Fig.11 Unclamped Inductive Waveform

Dimensions (PDFN5*6)



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.900	1.000	1.100
A1	0.254 REF.		
A2	0°0.05		
D	4.824	4.900	4.976
D1	1.605	1.705	1.805
D2	0.500	0.600	0.700
D3	4.924	5.000	5.076
E	5.924	6.000	6.076
E1	3.375	3.475	3.575
E2	5.674	5.750	5.826
b	0.350	0.400	0.450
e	1.270 TYP.		
L	0.534	0.610	0.686
L1	0.424	0.500	0.576
L2	1.800 REF.		
k	1.190	1.290	1.390
H	0.549	0.625	0.701
θ	8°	10°	12°
Φ	1.100	1.200	1.300
d			0.100

Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.90	1.05	1.20
b	0.35	0.40	0.50
C	0.20	0.25	0.35
D	4.90	5.05	5.20
D1/D2	1.51	1.61	1.71
d	0.50	0.60	0.70
E	6.00	6.15	6.30
E1	5.60	5.75	5.90
E2	3.47	3.57	3.67
e	1.27 BSC.		
H	0.48	0.58	0.68
K	1.17	1.27	1.37
L	0.64	0.74	0.84
L1/L2	0.20 REF.		
θ	8°	10°	12°
M	0.08 REF.		
N	0	-	0.15
O	0.25 REF.		
P	1.28 REF.		

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