

## General Description

The AGM1095MAP 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

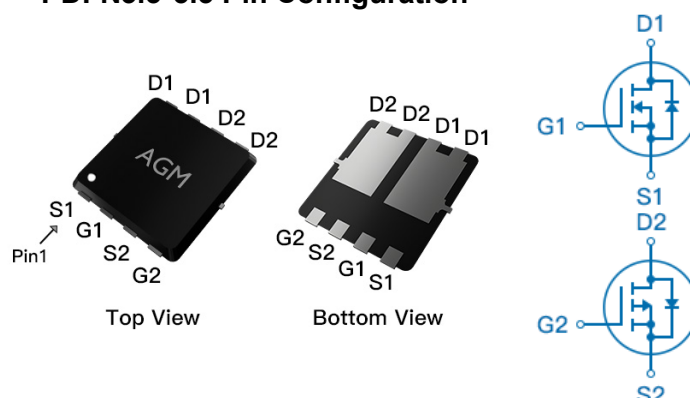
## Application

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

## Product Summary

BVDSS	RDSON	ID
100V	96mΩ	7A
-100V	220mΩ	-6A

## PDFN3.3\*3.3 Pin Configuration



## Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM1095MAP	AGM1095MAP	PDFN3.3*3.3	330mm	12mm	5000

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

Symbol	Parameter	Rating		Units
		N-Ch	P-Ch	
$V_{DS}$	Drain-Source Voltage ( $V_{GS}=0V$ )	100	-100	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0V$ )	$\pm 20$	$\pm 20$	V
ID	Drain Current-Continuous( $T_C=25^{\circ}\text{C}$ ) (Note 1)	7.0	-6.0	A
	Drain Current-Continuous( $T_C=100^{\circ}\text{C}$ )	4.2	-3.6	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	28	-24	A
$P_D$	Total Power Dissipation( $T_C=25^{\circ}\text{C}$ )	33.7	32	W
	Total Power Dissipation( $T_C=100^{\circ}\text{C}$ )	13.5	12.8	W
EAS	Avalanche energy (Note 3)	36	36	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) <sup>1</sup>	50	50	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	3.7	3.9	$^{\circ}\text{C/W}$

**Table 3. N- 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	100	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=100V,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	--	2.2	V
gFS	Forward Transconductance	VDS=5V,ID=3A	--	7	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=6A	--	96	120	mΩ
		VGS=4.5V, ID=3A	--	100	140	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=50V,VGS=0V, F=1MHZ	--	999	--	pF
Coss	Output Capacitance		--	46	--	pF
Crss	Reverse Transfer Capacitance		--	32	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=30V, RL=15Ω,RGEN=2.5Ω	--	50	--	nS
tr	Turn-on Rise Time		--	2.9	--	nS
td(off)	Turn-Off Delay Time		--	17.3	--	nS
tf	Turn-Off Fall Time		--	2.8	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=30V, ID=3A	--	25.4	--	nC
Qgs	Gate-Source Charge		--	4.2	--	nC
Qgd	Gate-Drain Charge		--	4.3	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	7.0	A
VSD	Forward on Voltage	VGS=0V,IS=6A	--	--	1.2	V
trr	Reverse Recovery Time	IF=6A , 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: TJ=25°C,VDD=30V,Vgs=10V , ID=12A,L=0.5mH,RG=25ohm

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

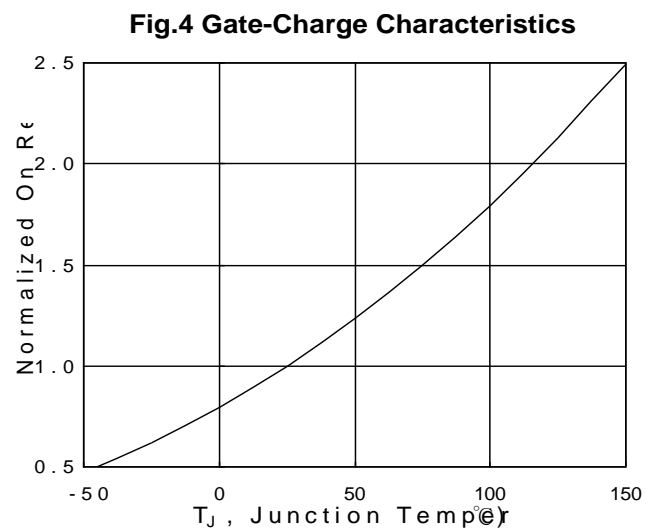
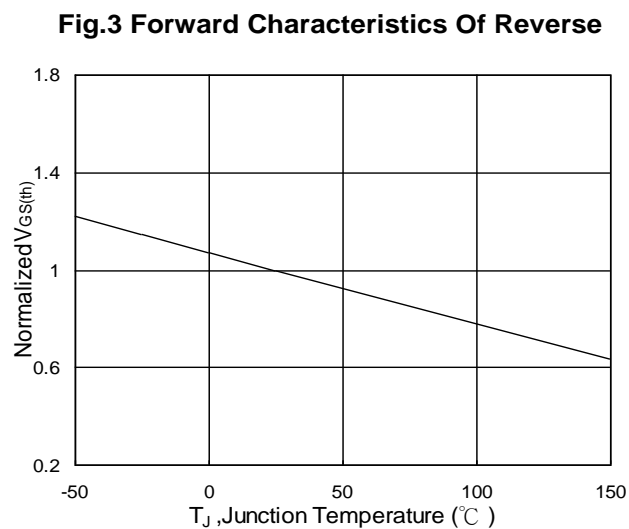
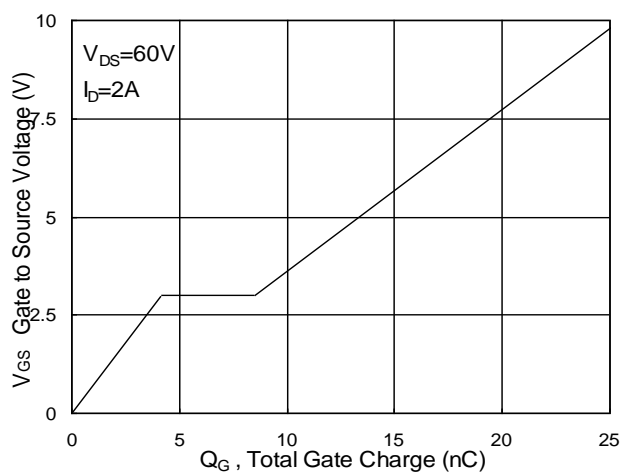
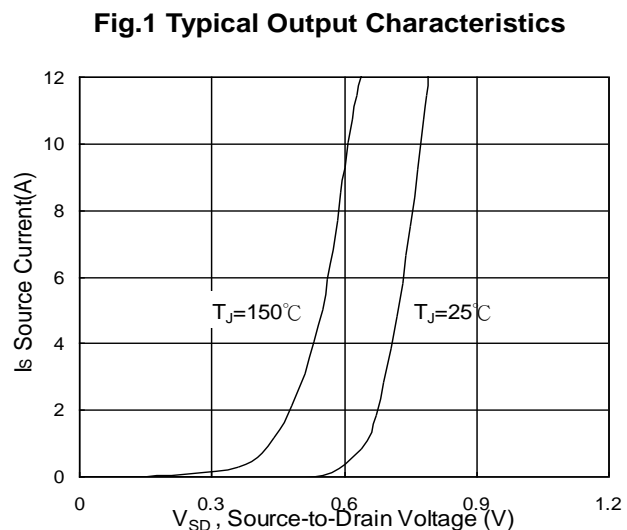
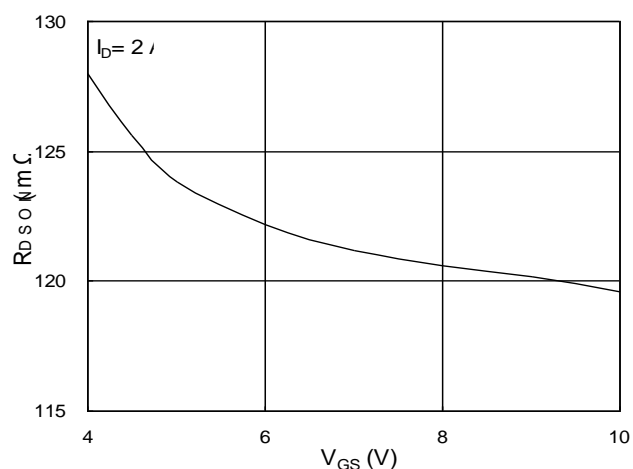
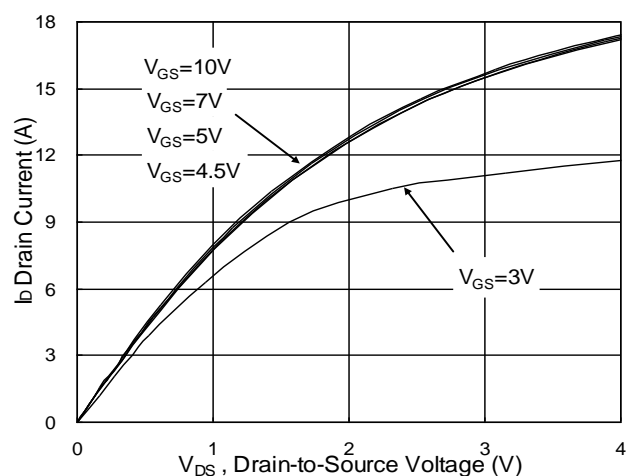
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=-250μA	-100	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=-100V,VGS=0V	--	--	-1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-1.2	-1.6	-2.2	V
gFS	Forward Transconductance	VDS=-5V,ID=-3A	--	7	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-10V, ID=-6A	--	220	250	mΩ
		VGS=-4.5V, ID=-3A	--	225	250	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=-50V,VGS=0V, F=1MHZ	--	1600	--	pF
Coss	Output Capacitance		--	86	--	pF
Crss	Reverse Transfer Capacitance		--	40	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	1.2	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=-10V,VDS=-50V, ID=-10A,RGEN=3.3Ω	--	12	--	nS
tr	Turn-on Rise Time		--	152	--	nS
td(off)	Turn-Off Delay Time		--	28	--	nS
tf	Turn-Off Fall Time		--	38	--	nS
Qg	Total Gate Charge	VGS=-10V, VDS=-50V, ID=-4A	--	33	--	nC
Qgs	Gate-Source Charge		--	4.3	--	nC
Qgd	Gate-Drain Charge		--	7.2	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	-6.0	A
VSD	Forward on Voltage	VGS=0V,IS=-6A	--	--	-1.2	V
trr	Reverse Recovery Time	IF=-6A , 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: TJ=25°C, VDD=-30V, Vgs=-10V , ID=-12A, L=0.5mH, RG=25ohm

## N- Channel 100V MOSFET



# N- Channel 100V MOSFET

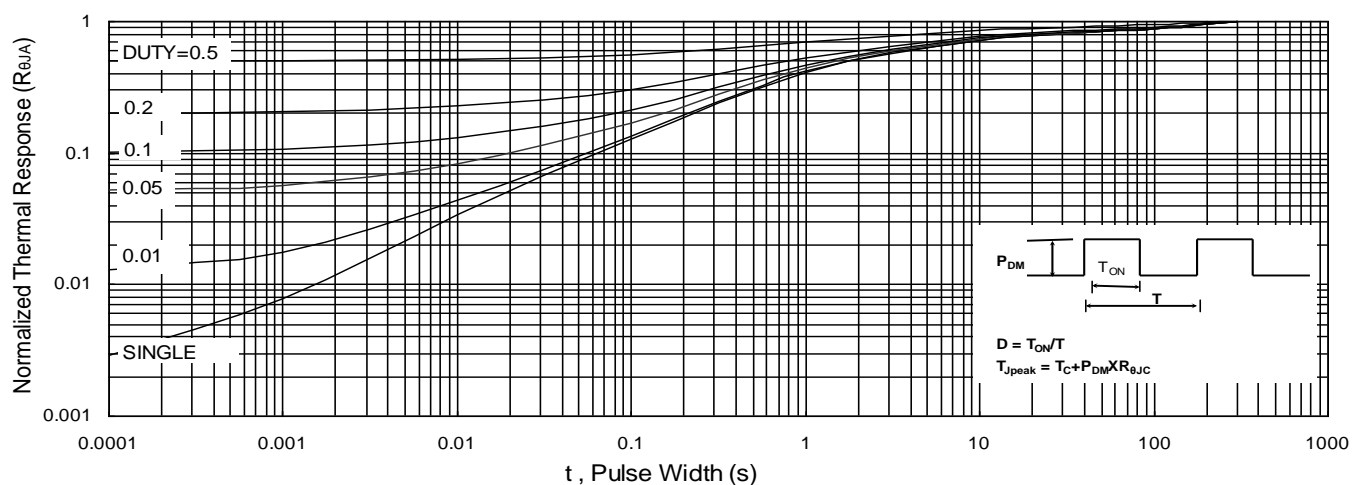
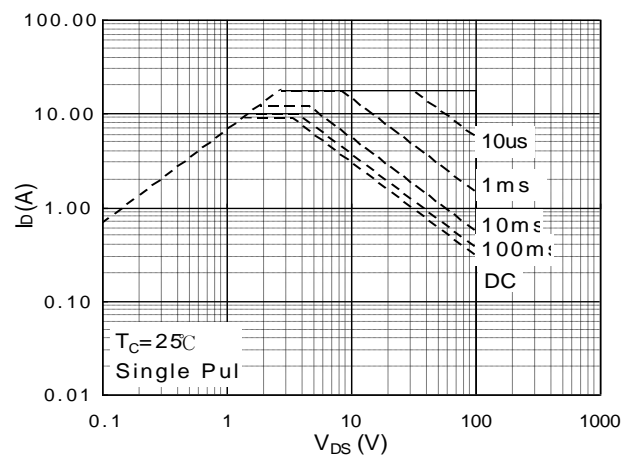
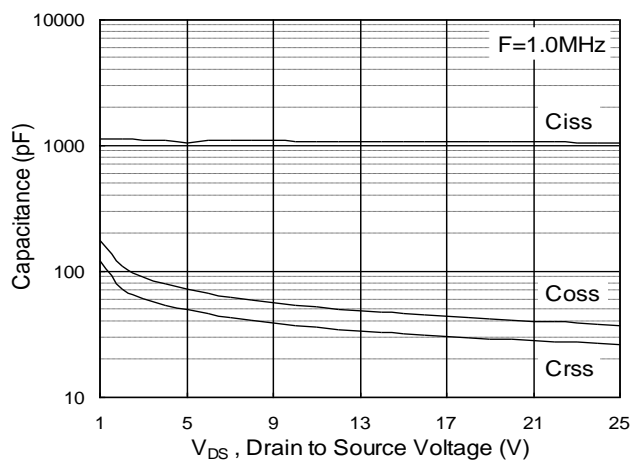
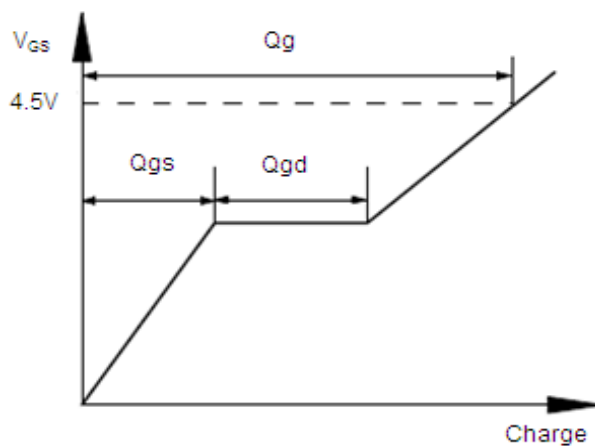
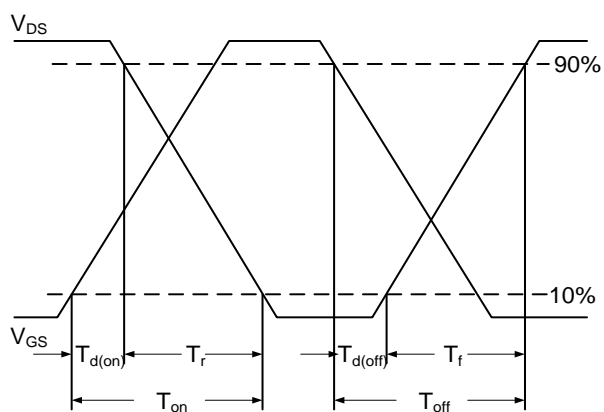


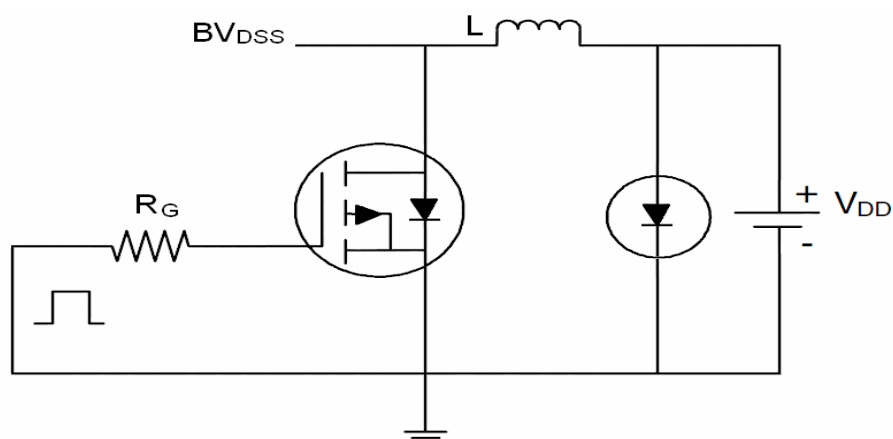
Fig.9 Normalized Maximum Transient Thermal Impedance



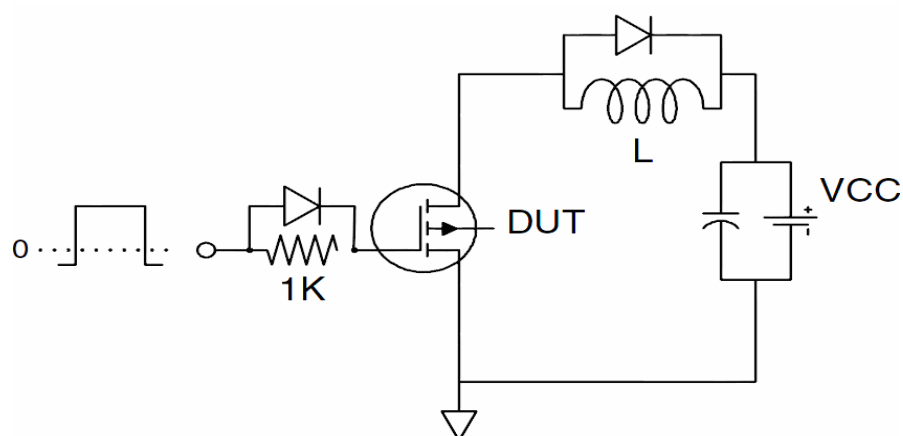
# P- Channel 100V MOSFET

## Test Circuit

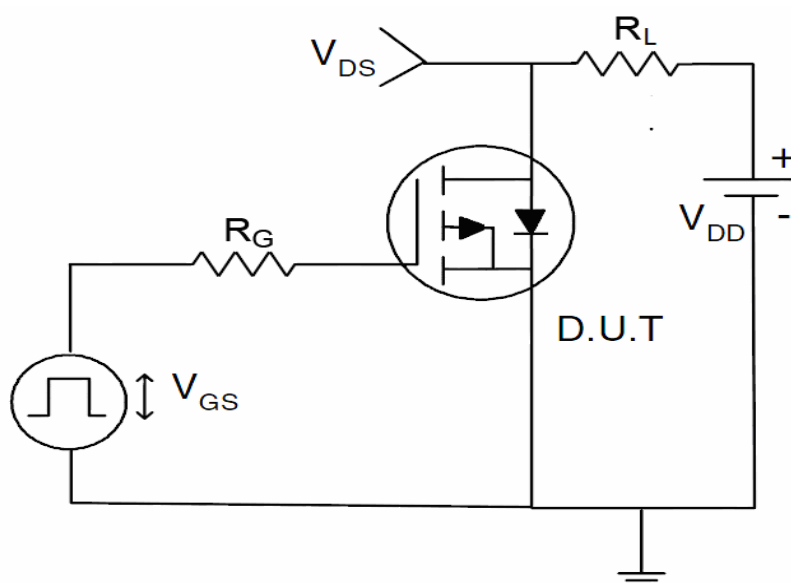
### 1) $E_{AS}$ Test Circuit



### 2) Gate Charge Test Circuit

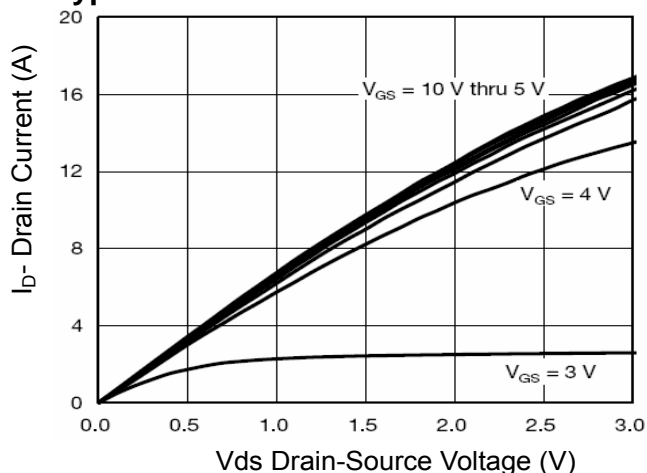


### 3) Switch Time Test Circuit

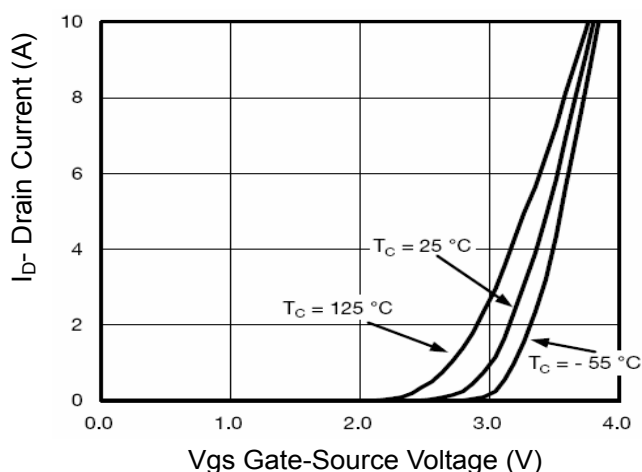


## P- Channel 100V MOSFET

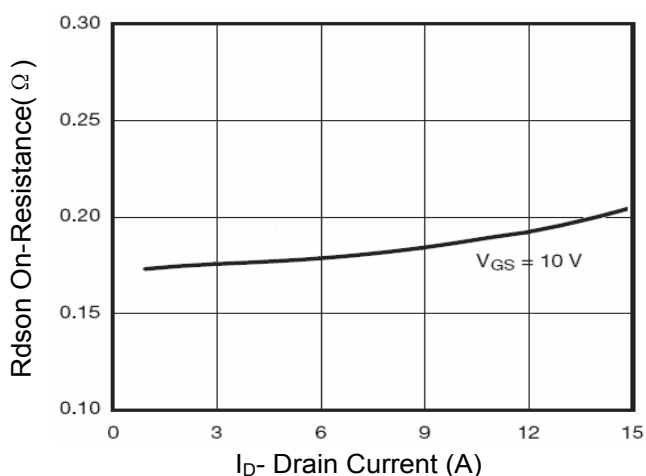
### Typical Electrical and Thermal Characteristics (Curves)



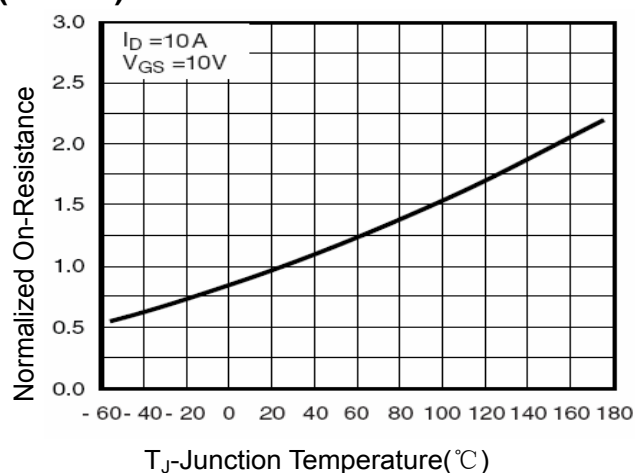
**Figure 1 Output Characteristics**



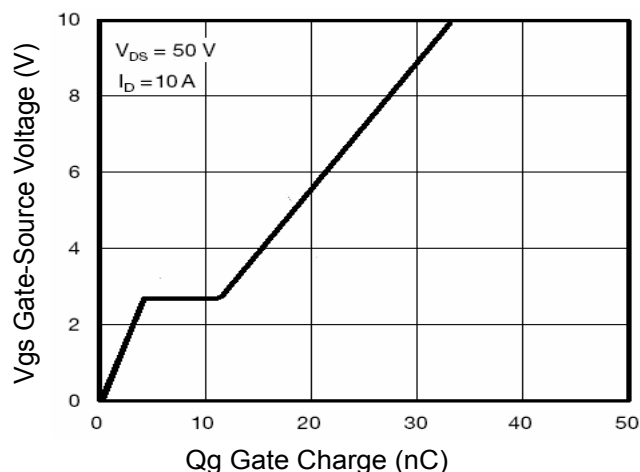
**Figure 2 Transfer Characteristics**



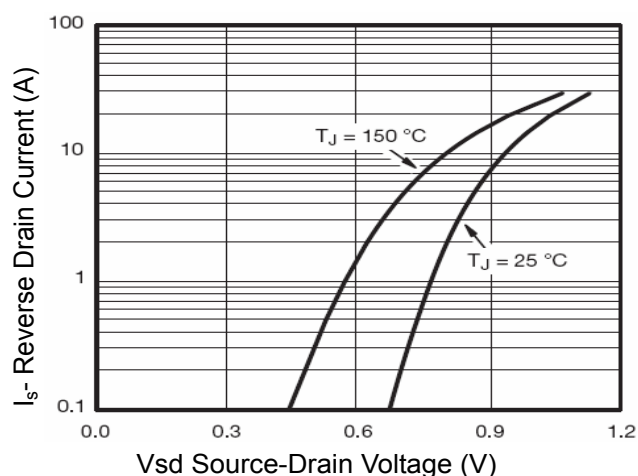
**Figure 3 Rdson- Drain Current**



**Figure 4 Rdson-Junction Temperature**



**Figure 5 Gate Charge**



**Figure 6 Source- Drain Diode Forward**

## P- Channel 100V MOSFET

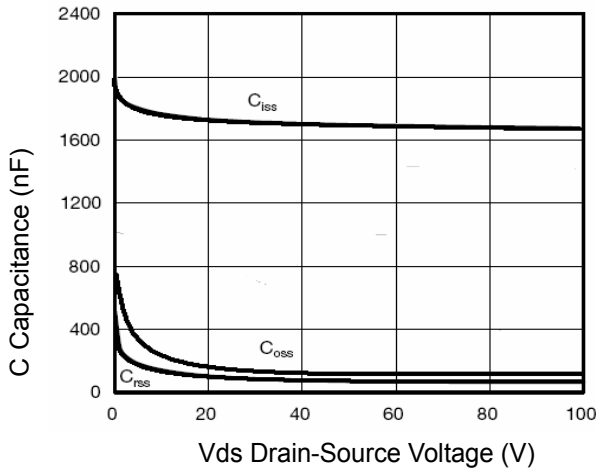


Figure 7 Capacitance vs Vds

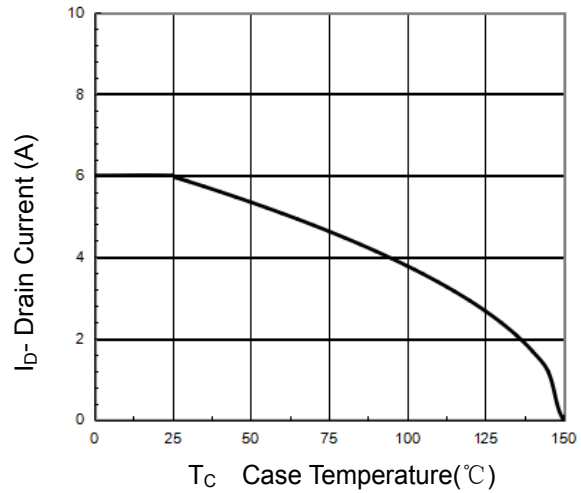


Figure 9 Drain Current vs Case Temperature

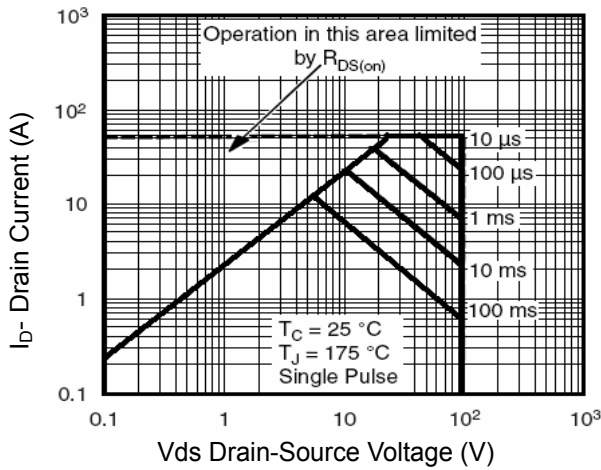


Figure 8 Safe Operation Area

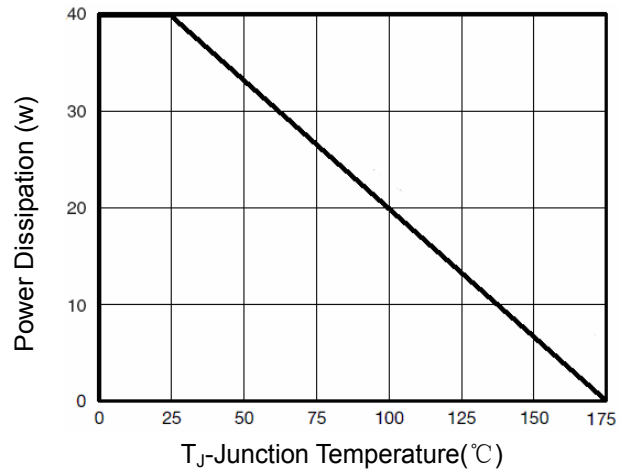


Figure 10 Power De-rating

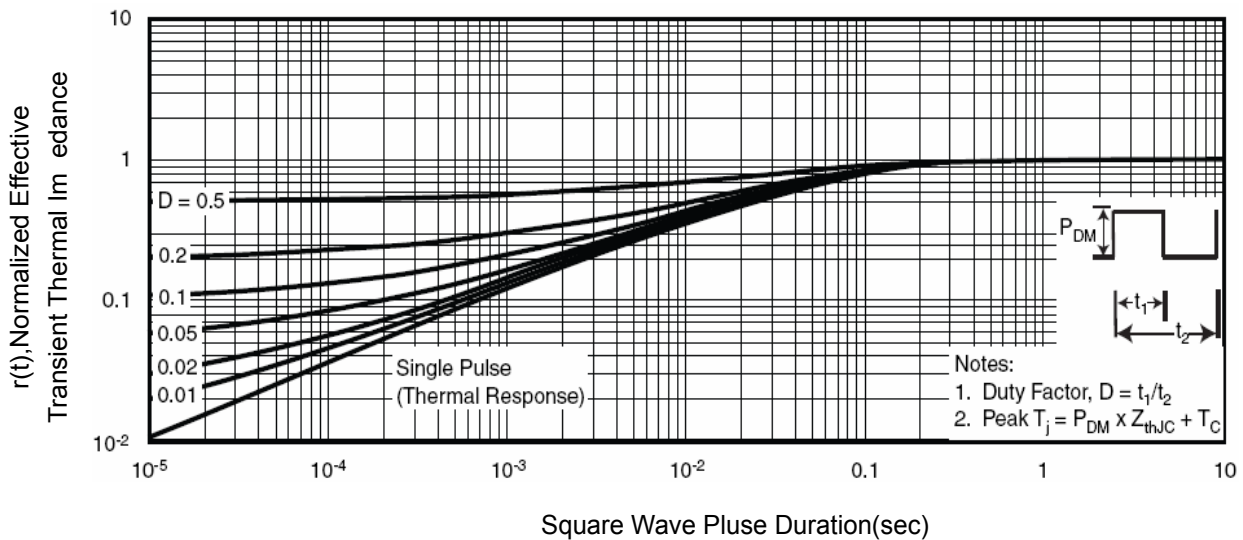
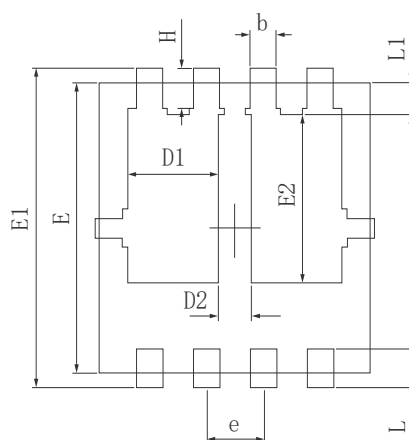
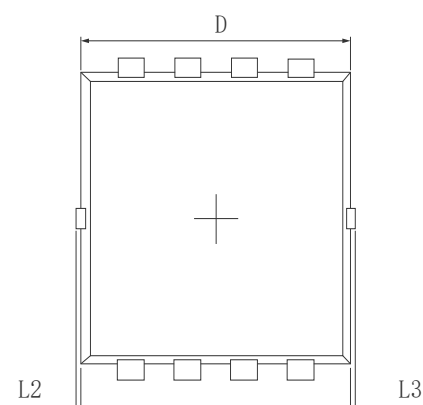


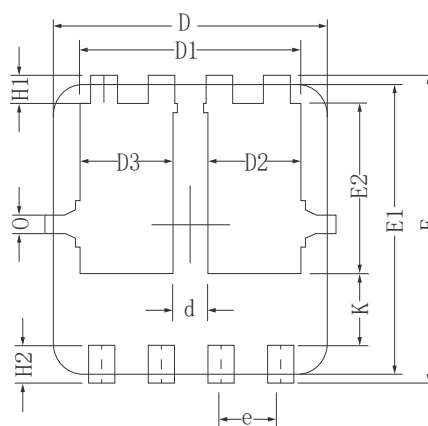
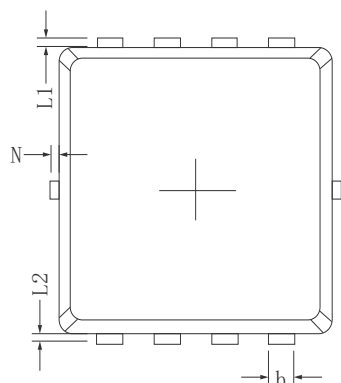
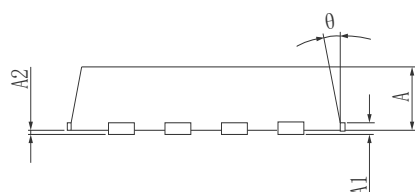
Figure 11 Normalized Maximum Transient Thermal Impedance



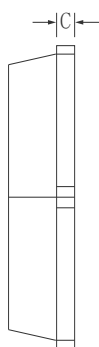
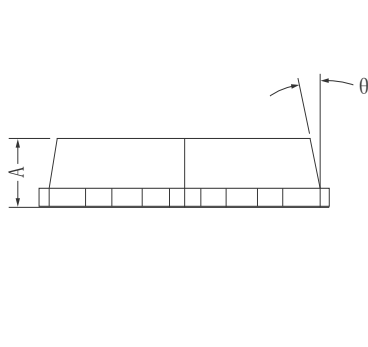
# ●Dimensions (PDFN3.3\*3.3)



SYMBOL	MILLIMETER	
	MIN	MAX
A	0.700	0.900
A1	0.152REF.	
A2	0~0.05	
D	3.000	3.200
D1	0.935	1.135
D2	0.280	0.480
E	2.900	3.100
E1	3.150	3.450
E2	1.535	1.935
b	0.200	0.400
e	0.550	0.750
L	0.300	0.500
L1	0.180	0.480
L2	0~0.100	
L3	0~0.100	
H	0.315	0.515
θ	8°	12°

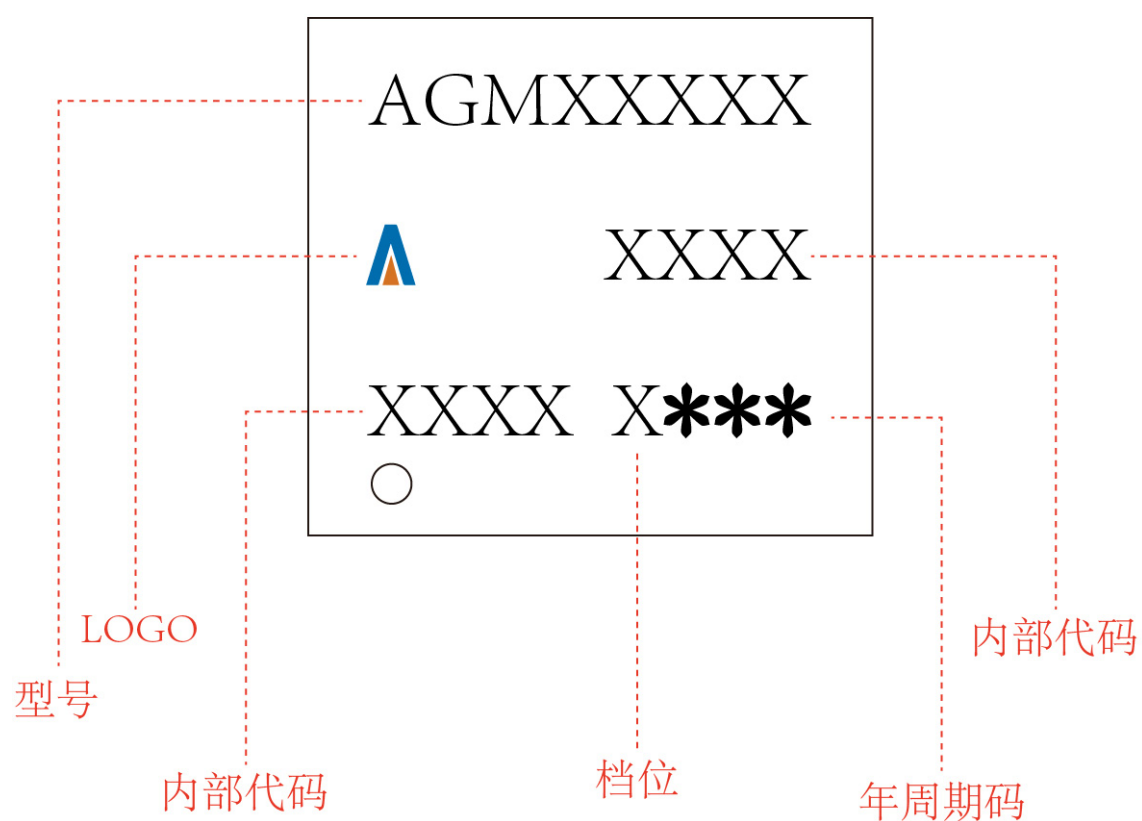


Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.65	0.75	0.85
b	0.25	0.30	0.35
C	0.15	0.20	0.25
D	3.00	3.10	3.20
D1	2.40	2.50	2.60
D2/D3	1.00	1.05	1.10
d	0.30	0.40	0.50
E	3.20	3.30	3.40
E1	3.00	3.10	3.20
E2	1.72	1.82	1.92
e	0.65 BSC.		
H1	0.21	0.31	0.41
H2	0.30	0.40	0.50
K	0.67	0.77	0.87
L1/L2	0.10 REF.		
θ	11°	12°	13°
N	0	-	0.15
0	0.2 REF.		



### PDFN3.3\*3.3

#### Marking Instructions:




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