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SEMICONDUCTOR

ESD TVS TSS MOV GDT PLED

AON3611-MS

Product specification

Description

The AON3611-MS uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

Features

V_{DS} = 30V　I_D =16 A

$R_{DS(ON)}$ < 20mΩ @ V_{GS}=10V

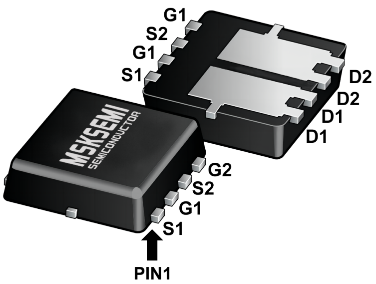
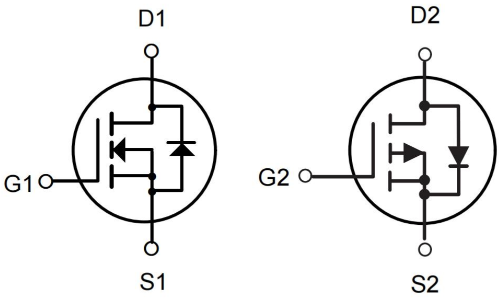
V_{DS} = -30V　I_D =- 14A

$R_{DS(ON)}$ < 30mΩ @ V_{GS}=10V

Application

- Battery protection
- Load switch
- Uninterruptible power supply

Reference News

PACKAGE OUTLINE	N+P-Channel MOSFET	Marking
		
DFN3X3-8L		

Absolute Maximum Ratings (TC=25℃ unless otherwise specified)

Symbol	Parameter	Rating		Units
		N-Channel	P-Channel	
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	16	-14	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	5	-4	A
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	2.3	-1.8	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	1.8	-1.5	A
I_{DM}	Pulsed Drain Current[2]	40	-40	A
EAS	Single Pulse Avalanche Energy[3]	26.6	110	mJ
I_{AS}	Avalanche Current	8.7	- 20	A
P_D@T_C=25℃	Total Power Dissipation[4]	10.8	10.8	W
P_D@T_A=100℃	Total Power Dissipation[4]	2	2	W
T_{STG}	Storage Temperature Range	-55 to 150	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	6	℃/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
△BV_{DSS}/△T_J	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.023	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=10A	---	14	20	mΩ
		V_{GS}=4.5V , I_D=6A	---	20	25	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	---	2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.2	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=24V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS} =±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=10A	---	14	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.3	---	Ω
Q_g	Total Gate Charge (4.5V)	V_{DS}=20V , V_{GS}=4.5V , I_D=10A	---	5	---	nC
Q_{gs}	Gate-Source Charge		---	1.11	---	
Q_{gd}	Gate-Drain Charge		---	2.61	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}= 12V , V_{GS}=10V , R_G=3.3Ω I_D=6A	---	7.7	---	ns
T_r	Rise Time		---	46	---	
$T_{d(off)}$	Turn-Off Delay Time		---	11	---	
T_f	Fall Time		---	3.6	---	
C_{iss}	Input Capacitance	V_{DS}= 15V , V_{GS}=0V , f=1MHz	---	416	---	pF
C_{oss}	Output Capacitance		---	62	---	
C_{rss}	Reverse Transfer Capacitance		---	51	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5]	$V_G=V_D=0V$, Force Current	---	---	16	A
I_{SM}	Pulsed Source Current[2,5]		---	---	30	A
V_{SD}	Diode Forward Voltage[2]	$V_{GS}=0V$, $I_S=1A$, $T_J=25^\circ C$	---	---	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 EAS data shows Max. rating . The test condition is VDD=25V,VGS=10V,L=0.1mH,IAS=12.7A

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

P-Channel Electrical Characteristics (TJ=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250uA$	-30	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , $I_D=-1mA$	---	-0.021	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	$V_{GS}=-10V$, $I_D=-8A$	---	25	30	mΩ
		$V_{GS}=-4.5V$, $I_D=-6A$	---	30	35	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250uA$	-1.0	---	-2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.2	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-24V$, $V_{GS}=0V$, $T_J=25^\circ C$	---	---	1	uA
		$V_{DS}=-24V$, $V_{GS}=0V$, $T_J=55^\circ C$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	±100	nA
gfs	Forward Transconductance	$V_{DS}=-5V$, $I_D=-8A$	---	12.6	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, f=1MHz		15	---	Ω
Q_g	Total Gate Charge (-4.5V)	$V_{DS}=-20V$, $V_{GS}=-4.5V$, $I_D=-6A$	---	9.8	---	nC
Q_{gs}	Gate-Source Charge		---	2.2	---	
Q_{gd}	Gate-Drain Charge		---	3.4	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-24V$, $V_{GS}=-10V$, $R_G=3.3\Omega$, $I_D=-1A$	---	16.4	---	ns
T_r	Rise Time		---	20.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	55	---	
T_f	Fall Time		---	10	---	
C_{iss}	Input Capacitance	$V_{DS}=-15V$, $V_{GS}=0V$, f=1MHz	---	930	---	pF
C_{oss}	Output Capacitance		---	148	---	
C_{rss}	Reverse Transfer Capacitance		---	115	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5]	$V_G=V_D=0V$, Force Current	---	---	-14	A
I_{SM}	Pulsed Source Current[2,5]		---	---	-24	A
V_{SD}	Diode Forward Voltage[2]	$V_{GS}=0V$, $I_S=-1A$, $T_J=25^\circ C$	---	---	-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 EAS data shows Max. rating . The test condition is VDD=-25V,VGS=-10V,L=0.1mH,IAS=-30A

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

N-Channel Typical Characteristics

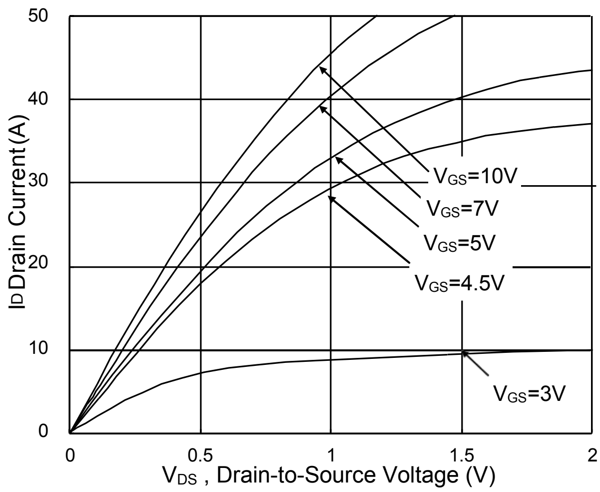


Fig.1 Typical Output Characteristics

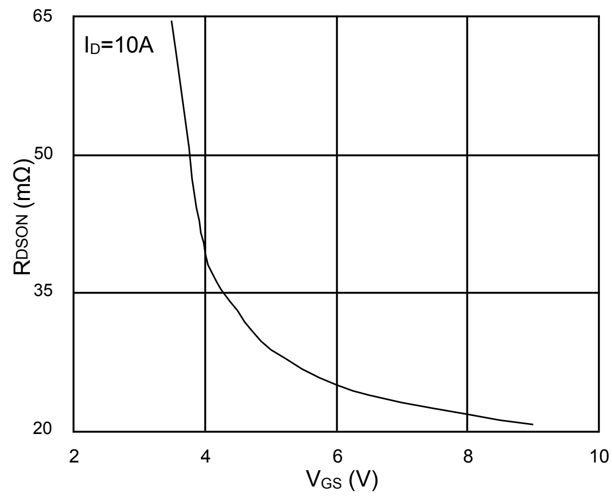


Fig.2 On-Resistance vs. Gate-Source

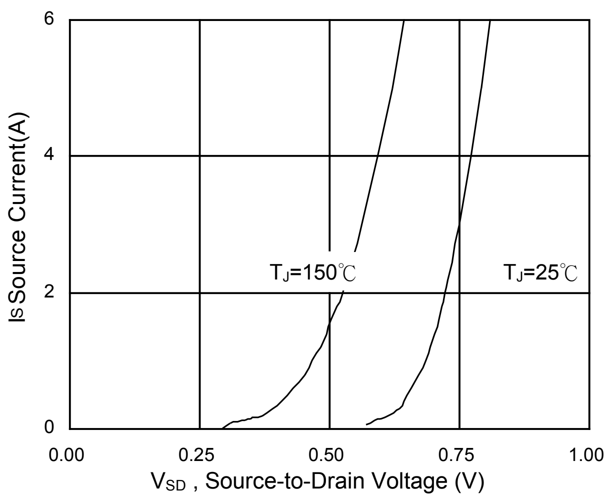


Fig.3 Forward Characteristics Of Reverse

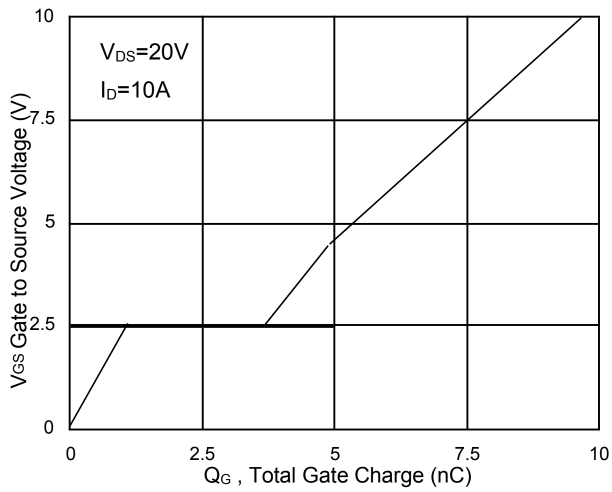


Fig.4 Gate-Charge Characteristics

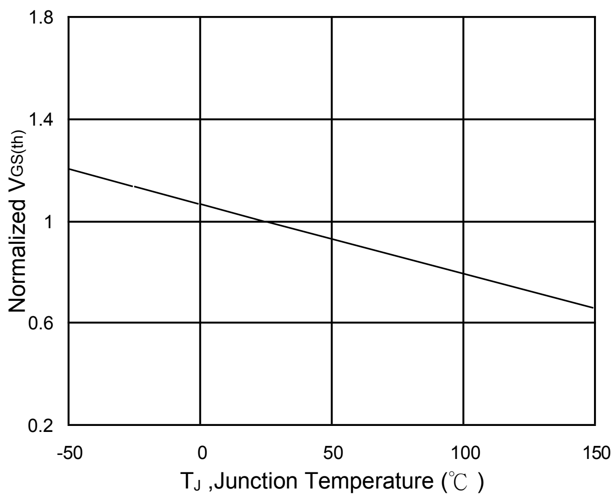


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

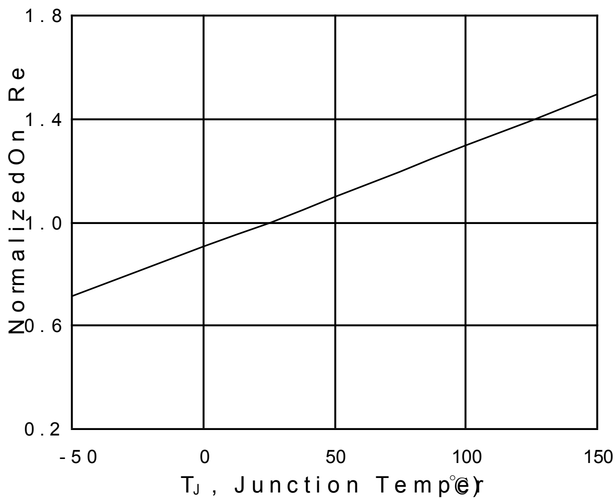
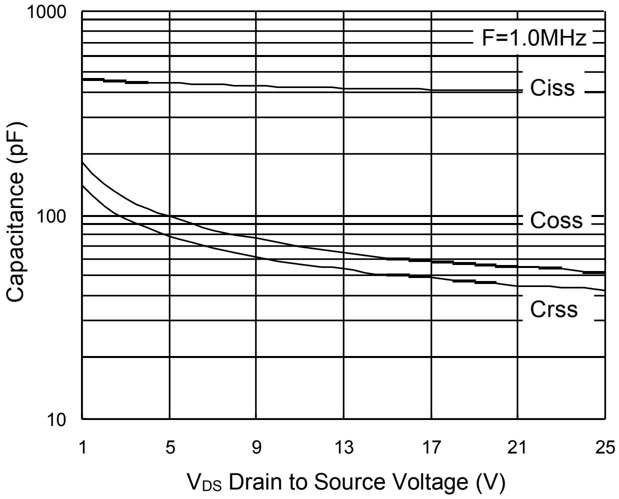


Fig.6 Normalized R_{DSON} vs. T_J



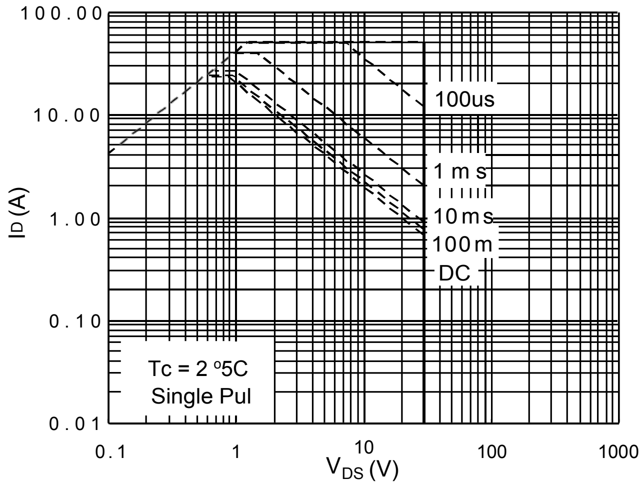


Fig.7 Capacitance

Fig.8 Safe Operating Area

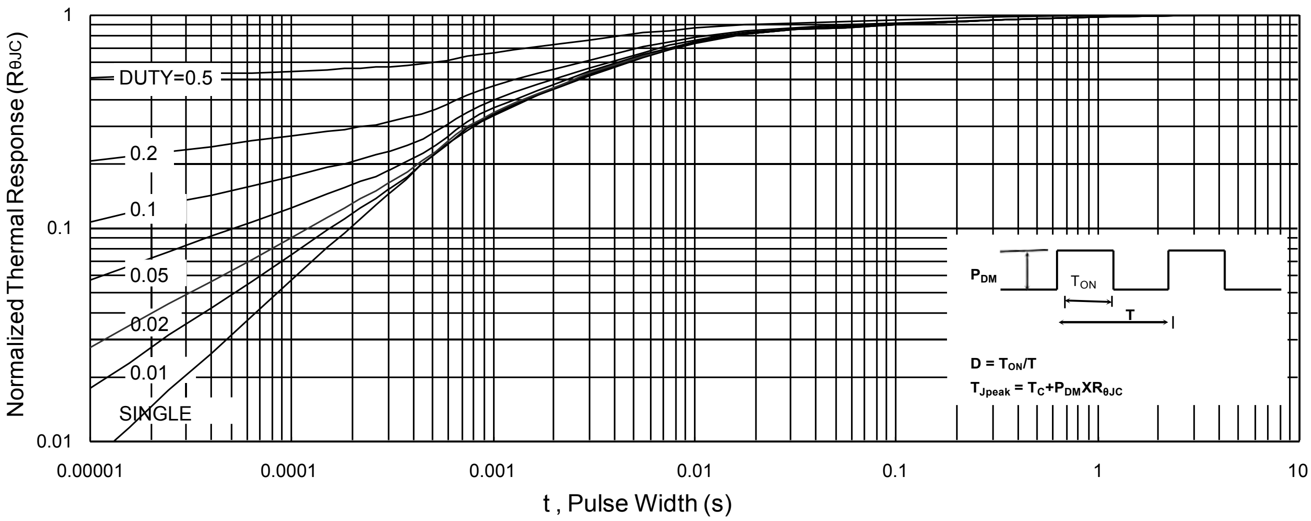
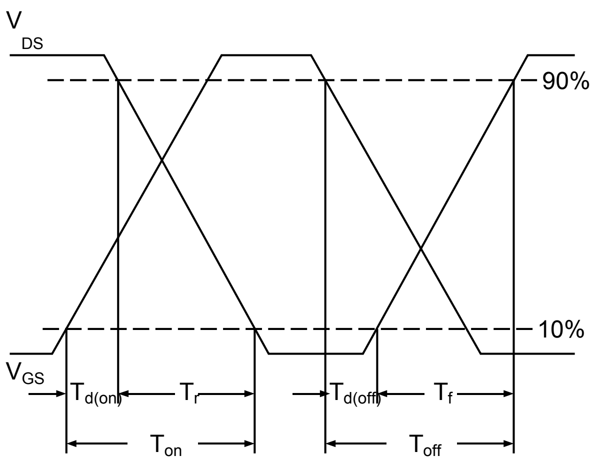
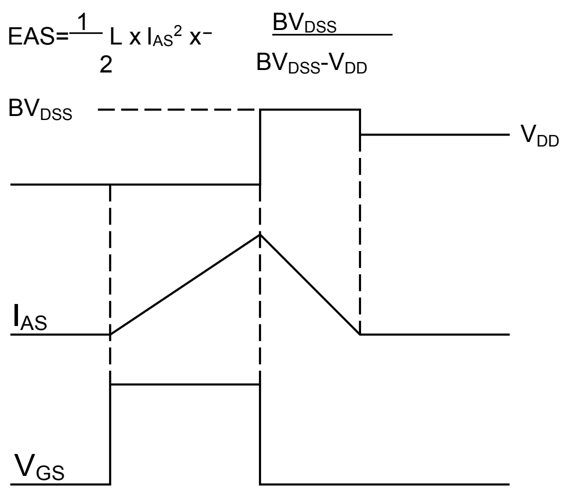


Fig.9 Normalized Maximum Transient Thermal Impedance





P-Channel Typical Characteristics

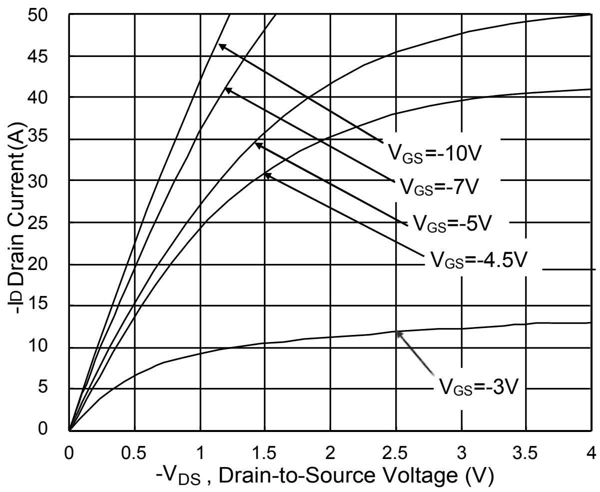


Fig.1 Typical Output Characteristics

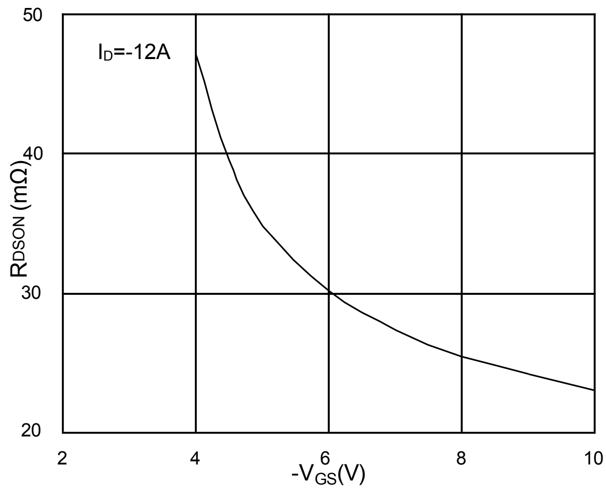


Fig.2 On-Resistance v.s Gate-Source

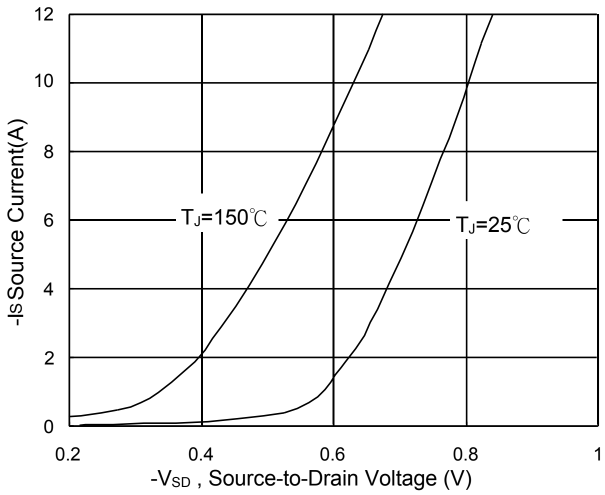


Fig.3 Forward Characteristics Of Reverse

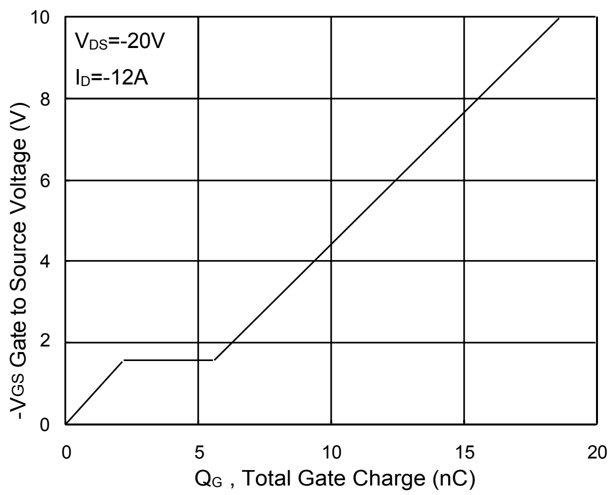


Fig.4 Gate-Charge Characteristics

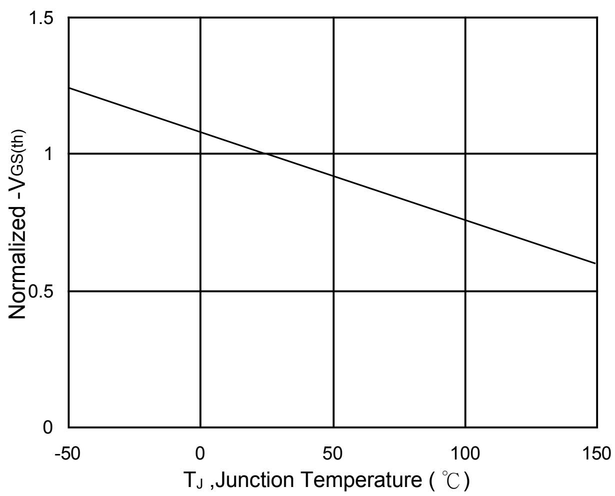


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

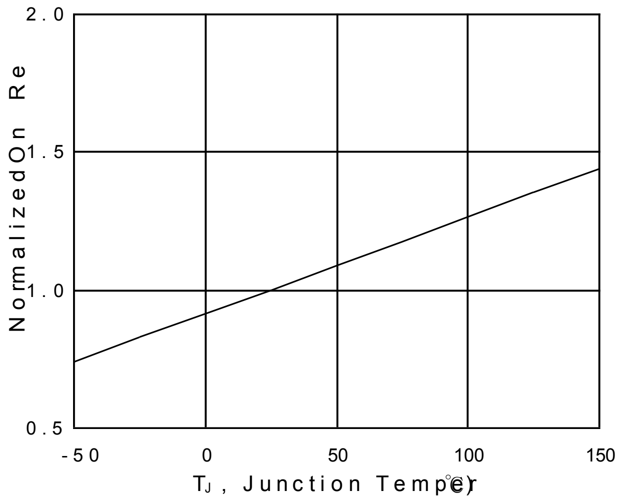


Fig.6 Normalized R_{DSON} v.s T_J

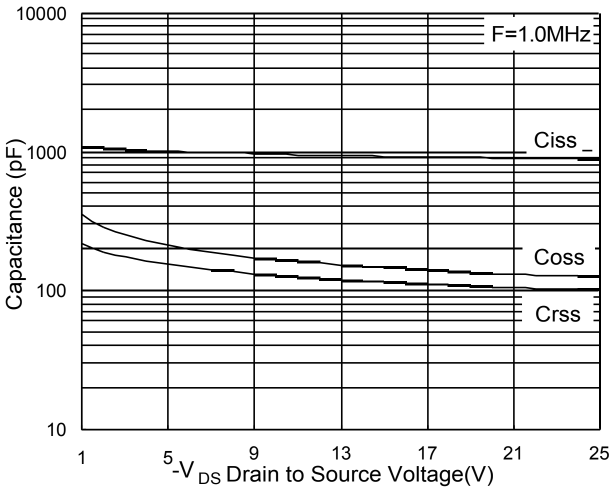


Fig.7 Capacitance

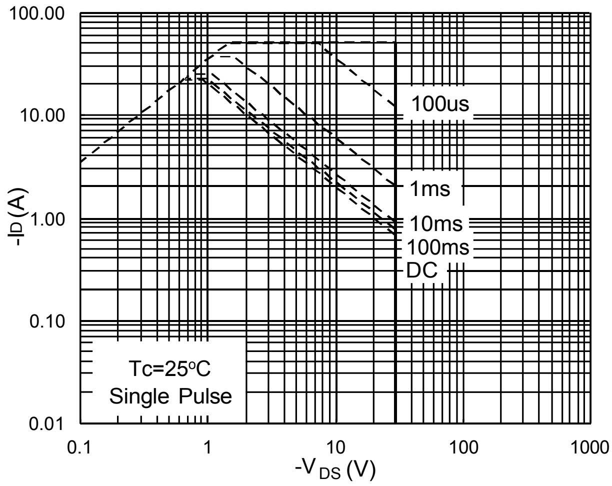


Fig.8 Safe Operating Area

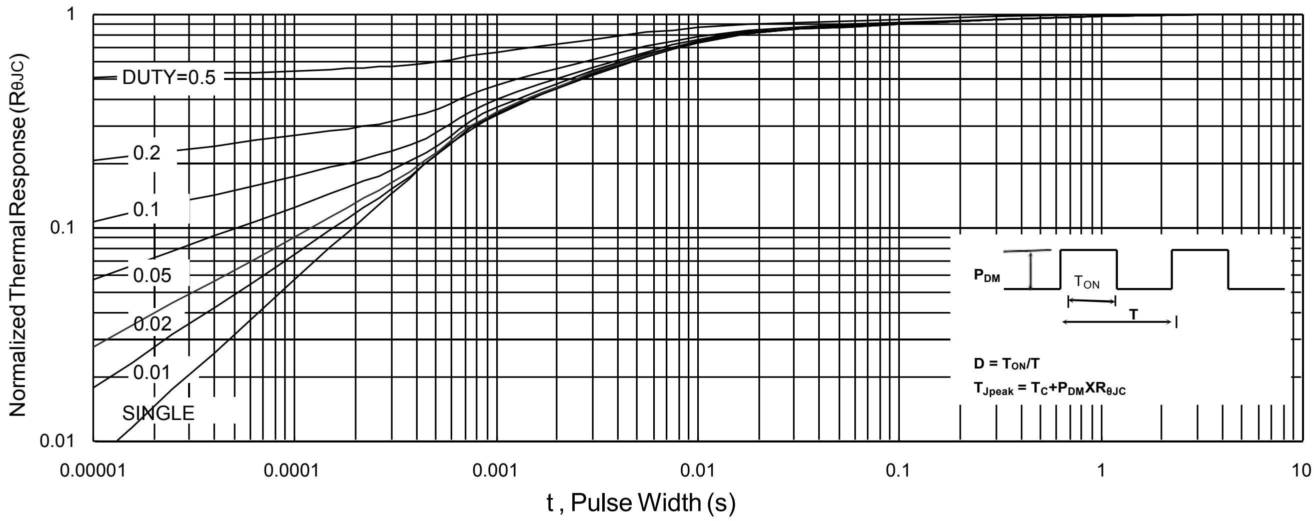


Fig.9 Normalized Maximum Transient Thermal Impedance

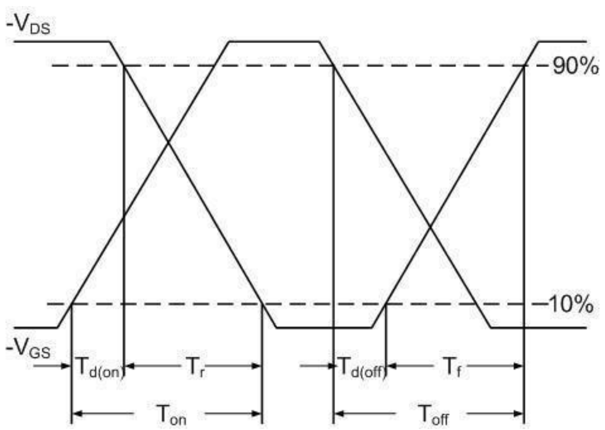


Fig.10 Switching Time Waveform

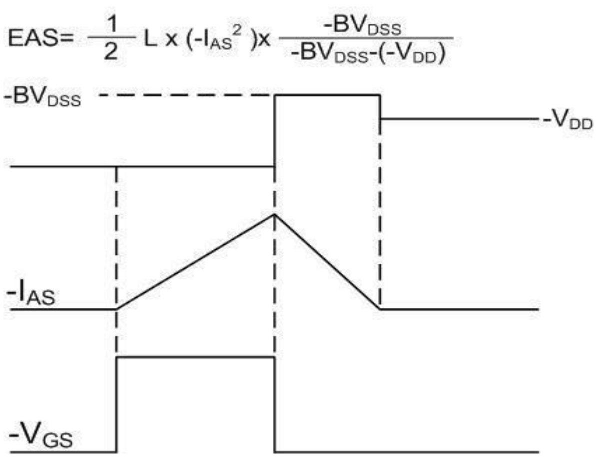
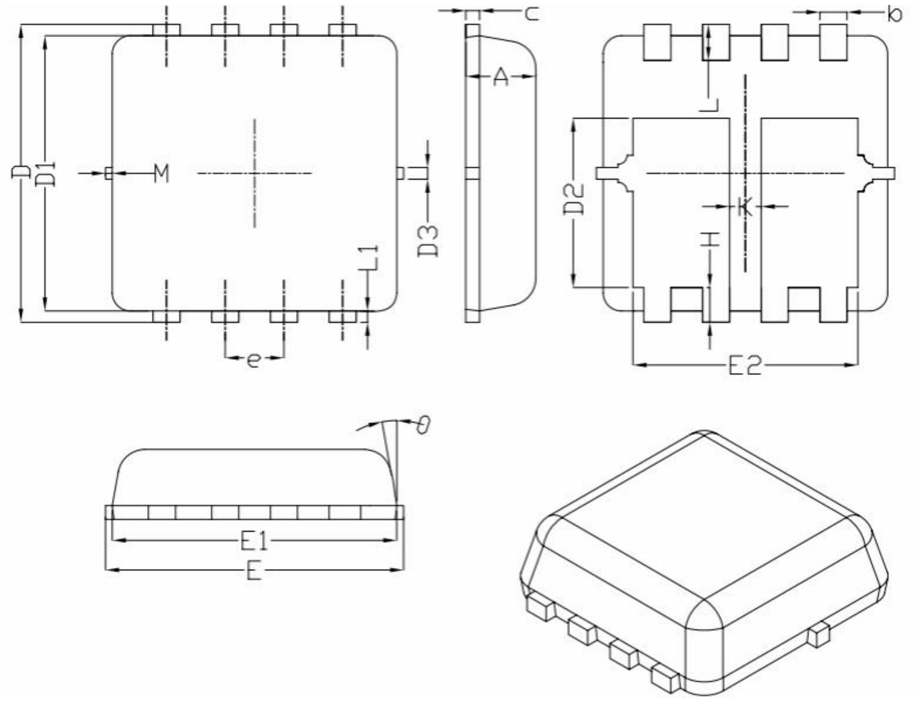
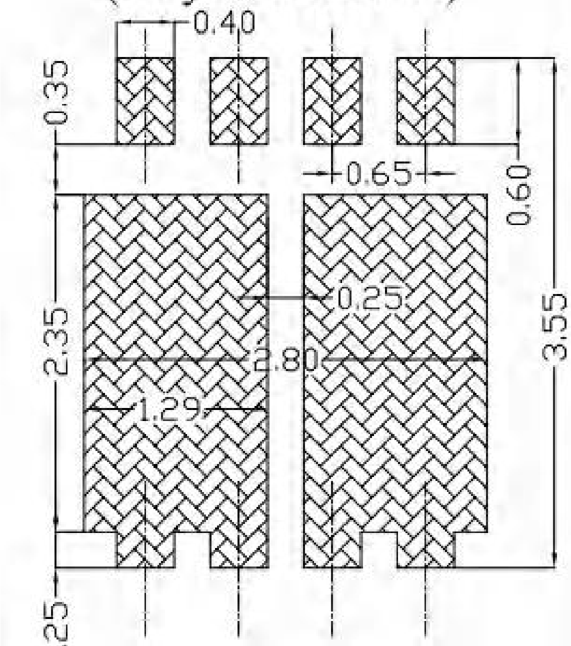


Fig.11 Unclamped Inductive Switching Waveform

DFN3X3-8L Package Information



Land Pattern
(Only for Reference)



SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
K	0.30	---	---
θ	---	10°	12°
M	*	*	0.15

* Not specified

REEL SPECIFICATION

P/N	PKG	QTY
AON7401-MS	DFN3X3-8L	5000

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