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SEMICONDUCTOR

ESD TVS TSS MOV GDT PLED

FDMC510P-MS

Product specification

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Description

The FDMC510P-MS uses advanced trench technologyto 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.
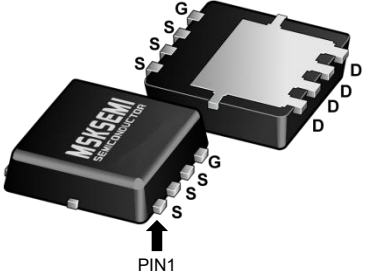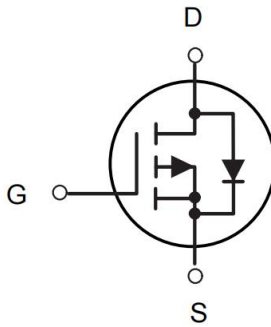
Features

V_{DS} = -20V I_D = -60 A

$R_{DS(ON)}$ < 10mΩ @ V_{GS}= -4.5V

Application

- Battery protection

- Load switch

- Uninterruptible power supply

Reference News

PACKAGE OUTLINE	P-Channel MOSFET	Marking
DFN3X3-8L		MSKSEMI FDMC510P P20

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	-20	V
VGS	Gate-Source Voltage	± 12	V
I_D@TC=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	-60	A
I_D@TC=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	-30	A
IDM	Pulsed Drain Current[2]	-78	A
P_D@TC=25℃	Total Power Dissipation[4]	22	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{θJA}$	Thermal Resistance Junction-ambient [1]	75	℃/ W
$R_{θJC}$	Thermal Resistance Junction-Case[1]	4.2	℃/ W

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	-20	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.012	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-4.5V , I_D=-10A	---	7	10	mΩ
		V_{GS}=-2.5V , I_D=-8A	---	9	12	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, I_D =-250uA	-0.4	-0.7	-1.0	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	2.94	---	Mv/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-15V , V_{GS}=0V , T_J=25℃	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}= $\pm$12 V , V_{DS}=0V	---	---	$\pm$100	nA
gfs	Forward Transconductance	V_{DS}=-5V , I_D=-10A	---	43	---	S
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-10V , V_{GS}=-4.5V , I_D=-10A	---	35	---	nC
Q_{gs}	Gate-Source Charge		---	5.0	---	
Q_{gd}	Gate-Drain Charge		---	10	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-10V , V_{GS}=-4.5V , R_G=3.3Ω , I_D=-10A	---	12.0	---	ns
T_r	Rise Time		---	40.0	---	
$T_{d(off)}$	Turn-Off Delay Time		---	30	---	
T_f	Fall Time		---	10	---	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	2800	---	pF
C_{oss}	Output Capacitance		---	690	---	
C_{rss}	Reverse Transfer Capacitance		---	590	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,4]	$V_G=V_D$=0V , Force Current	---	---	-60.0	A
I_{SM}	Pulsed Source Current[2,4]		---	---	---	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=- 1A , T_J=25C	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	IF=-10A , dI/dt=100A/µs , T_J =25℃	---	27	---	nS
Q_{rr}	Reverse Recovery Charge		---	17.8	---	nC

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 $\leqq$ 300us , duty cycle $\leqq$ 2%
3.The power dissipation is limited by 150C junction temperature
4.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.
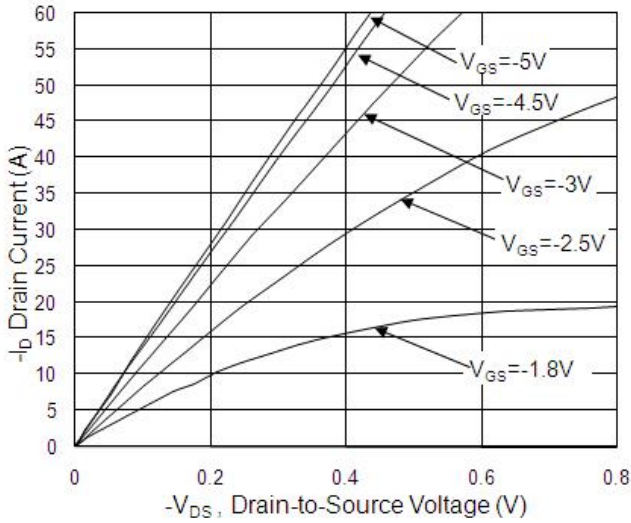
Typical Characteristics
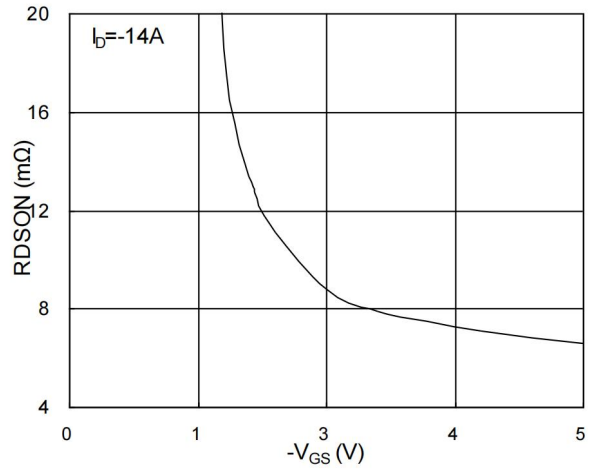

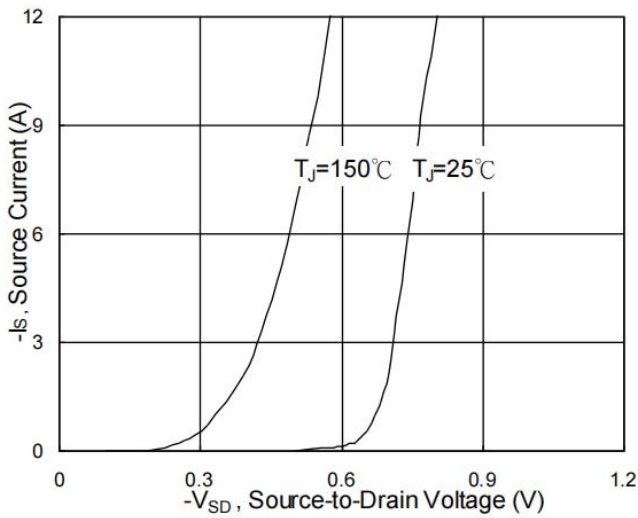Fig.1 Typical Output Characteristics

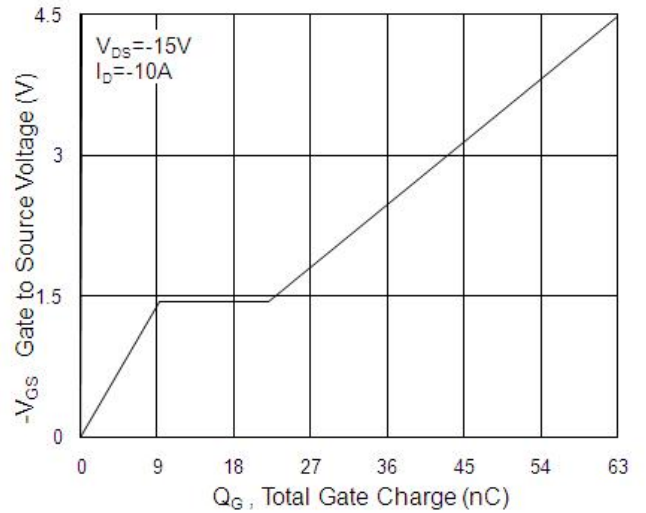Fig.2 On-Resistance vs. G-S Voltage

Fig.3 Forward Characteristics of Reverse

Fig.4 Gate-charge Characteristics

Fig.5 Normalized VGS(th) vs. TJ
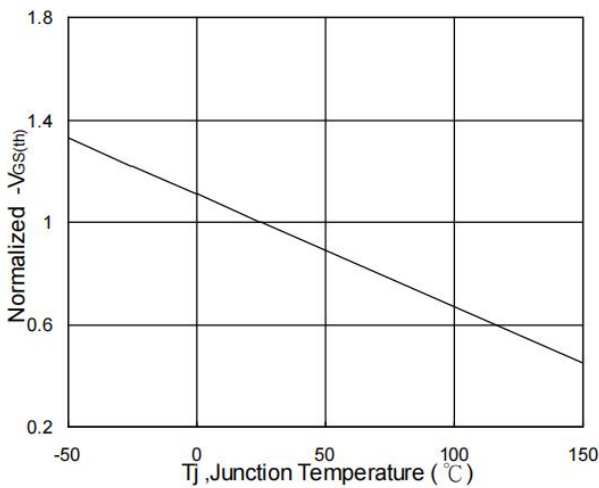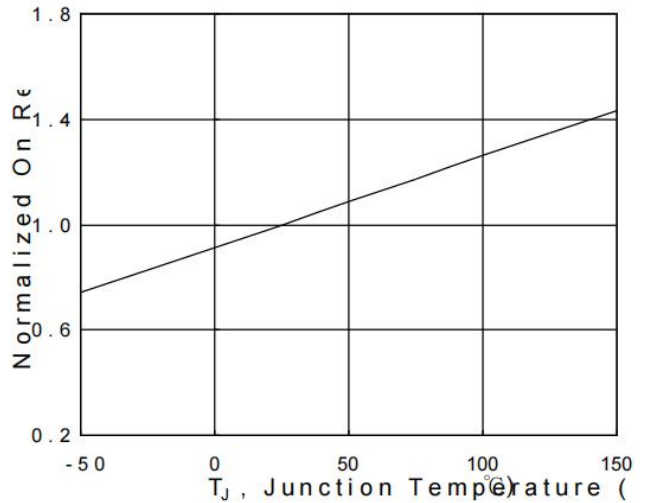

Fig.6 Normalized RDSON vs. TJ

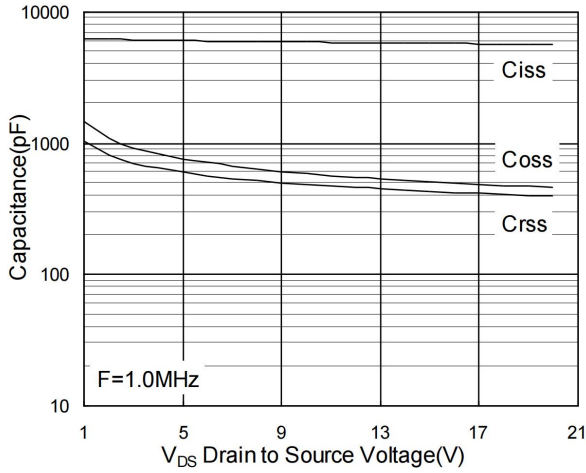MSKSEMI
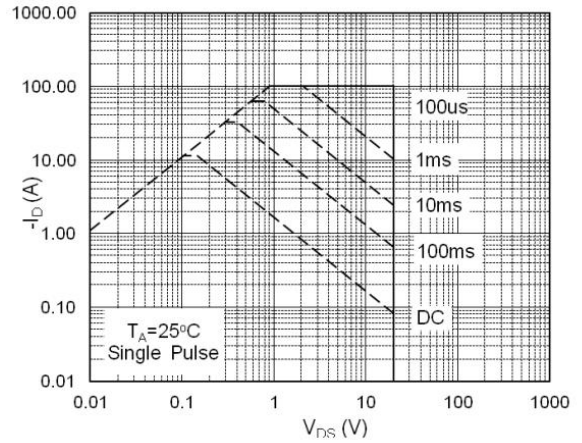SEMICONDUCTOR

Fig.7 Capacitance
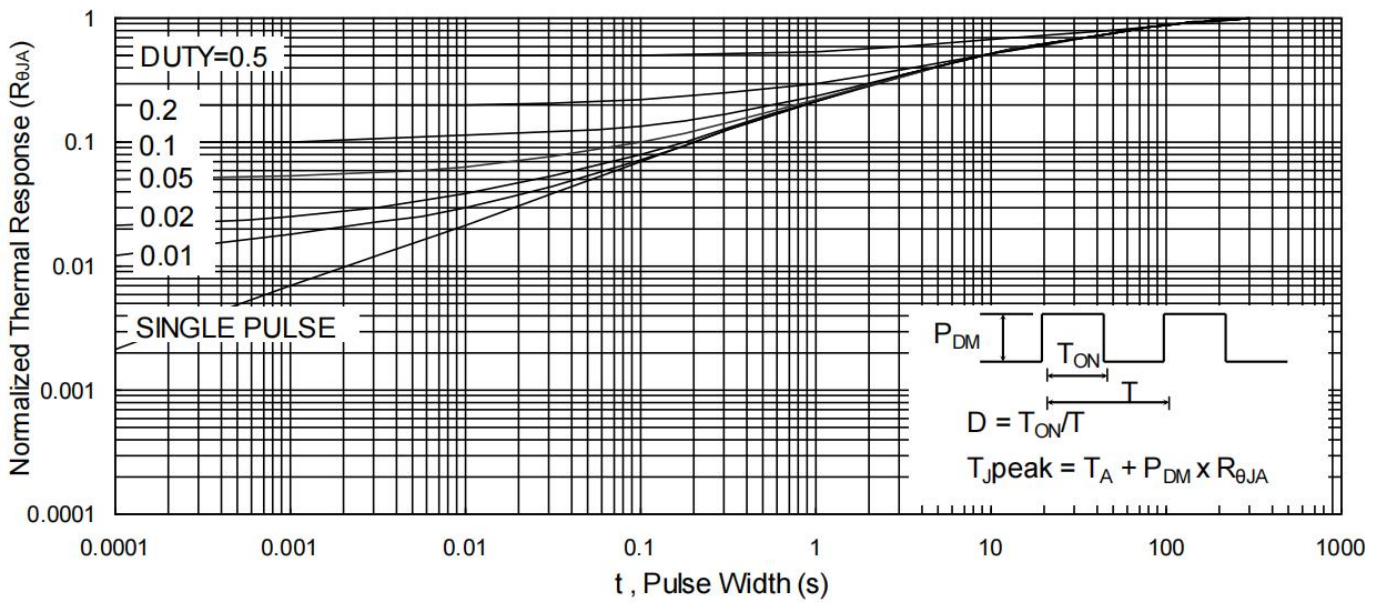

Fig.8 Safe Operating Area

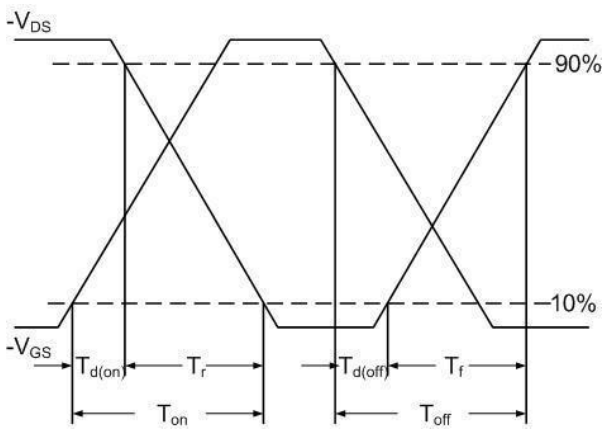Fig.9 Normalized Maximum Transient Thermal Impedance

Fig.10 Switching Time Waveform
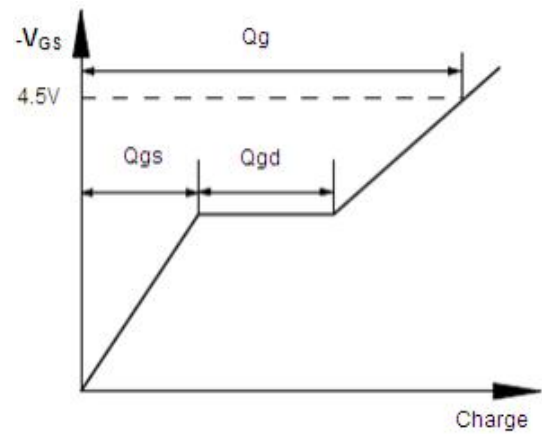
Fig.11 Gate Charge Waveform

DFN3X3-8L Package Information
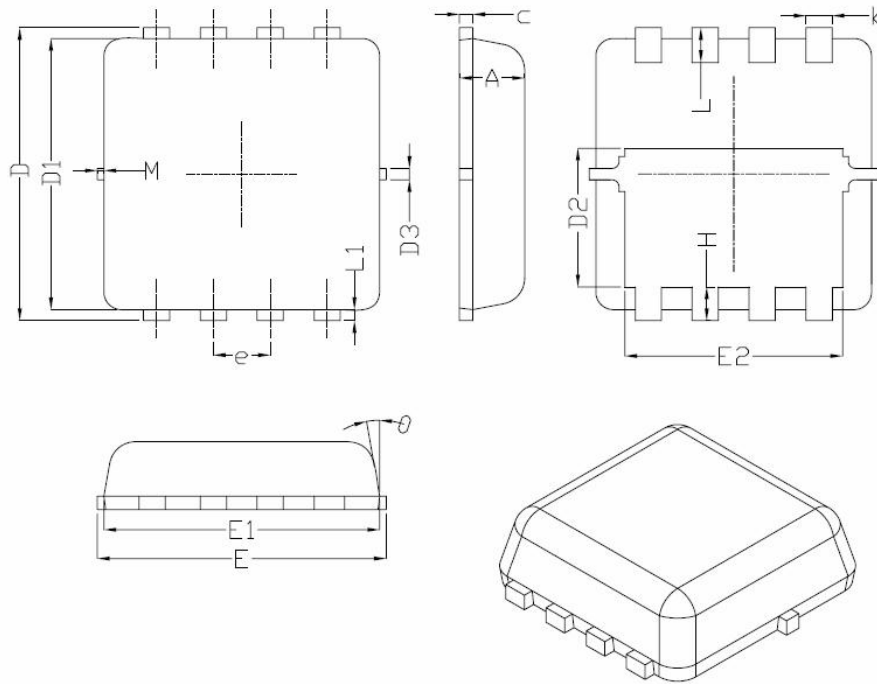
Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.48	1.58	1.68
D3	-	0.13	-
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
M	*	*	0.15
θ		10°	12°

REEL SPECIFICATION

P/N	PKG	QTY
FDMC510P-MS	DFN3X3-8L	5000

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