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SEMICONDUCTOR



ESD



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PLED

FDMC8554-MS

Product specification

Description

The FDMC8554-MS uses advanced trench technology to provide excellent $R_{DS(ON)}$, 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.

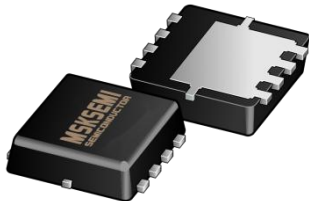
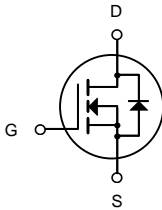

Features

- $V_{DS} = 20V$ $I_D = 60 A$
- $R_{DS(ON)} < 5m\Omega$ @ $V_{GS} = 4.5V$

Application

- Battery protection
- Load switch
- Uninterruptible power supply

Reference News

DFN3X3-8L	N-Channel MOSFET	Marking
		

Absolute Maximum Ratings ($T_c = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D @ T_c = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	60	A
$I_D @ T_c = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	33	A
I_{DM}	Pulsed Drain Current ²	220	A
EAS	Single Pulse Avalanche Energy ³	46	mJ
I_{AS}	Avalanche Current	25	A
$P_D @ T_c = 25^\circ C$	Total Power Dissipation ⁴	15	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	4.5	$^\circ C/W$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V,$	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$	-	-	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4	0.7	1.1	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	$V_{GS}=4.5V, I_D=30A$	-	4.0	5	m Ω
		$V_{GS}=2.5V, I_D=20A$	-	6.0	9	
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V,$ $f = 1.0MHz$	-	2500	-	pF
C_{oss}	Output Capacitance		-	407	-	pF
C_{rss}	Reverse Transfer Capacitance		-	386	-	pF
Q_g	Total Gate Charge	$V_{DS}=10V, I_D=30A,$ $V_{GS}=4.5V$	-	32	-	nC
Q_{gs}	Gate-Source Charge		-	3	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	11	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=10V,$ $I_D=30A, R_{GEN}=3\Omega,$ $V_{GS}=4.5V$	-	17	-	ns
t_r	Turn-on Rise Time		-	49	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	74	-	ns
t_f	Turn-off Fall Time		-	26	-	ns
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	75	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	300	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_S=30A$	-	-	1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J=25^{\circ}\text{C}$, $V_{DD}=10V$, $V_G=4.5V$, $L=0.5mH$, $R_G=25^{\circ}\text{C}$, $I_{AS}=15A$
3. Pulse Test: Pulse Width 300 μs , Duty Cycle 0.5%

Typical Performance Characteristics

Figure 1: Output Characteristics

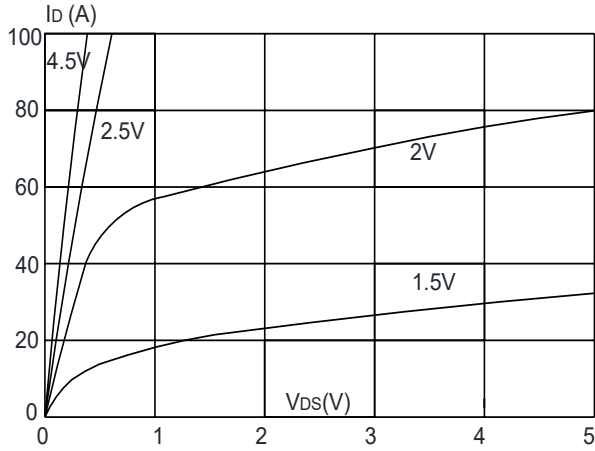


Figure 2: Typical Transfer Characteristics

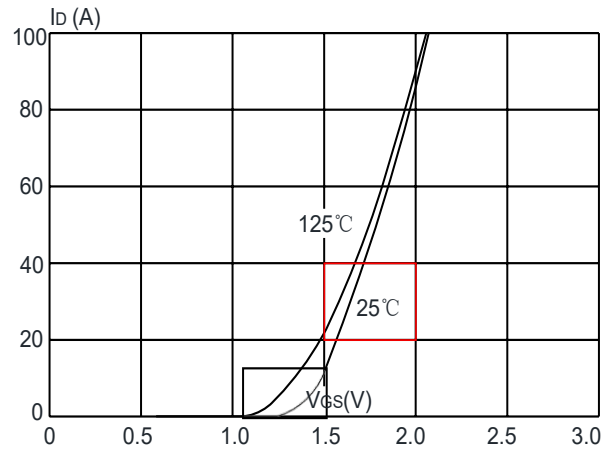


Figure 3: On-resistance vs. Drain Current

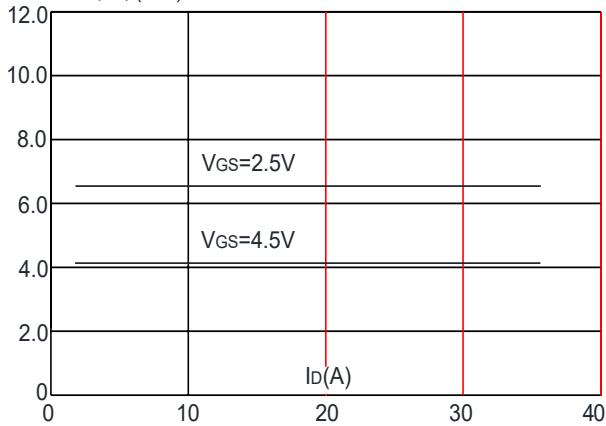


Figure 4: Body Diode Characteristics

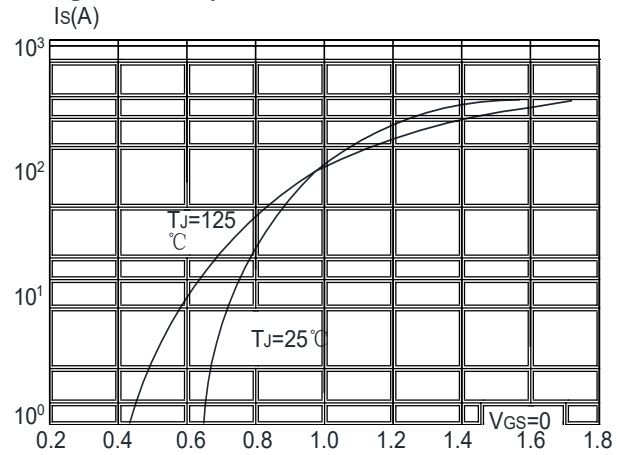


Figure 5: Gate Charge Characteristics

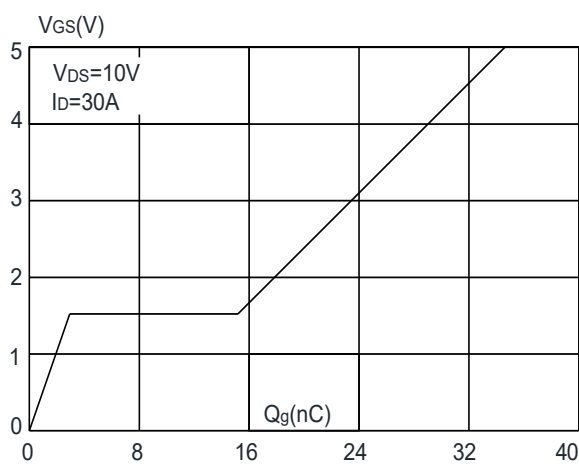


Figure 6: Capacitance Characteristics

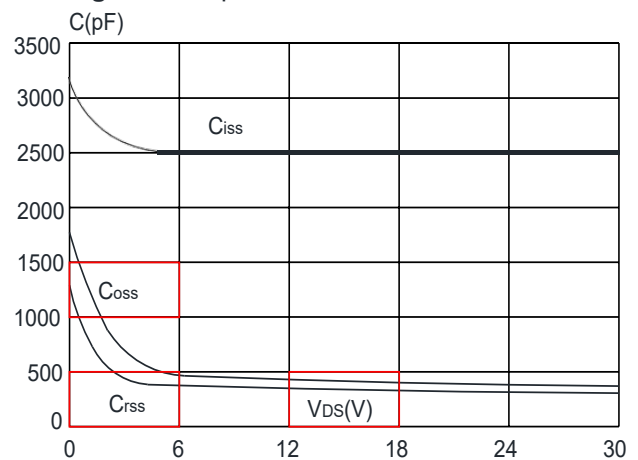


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

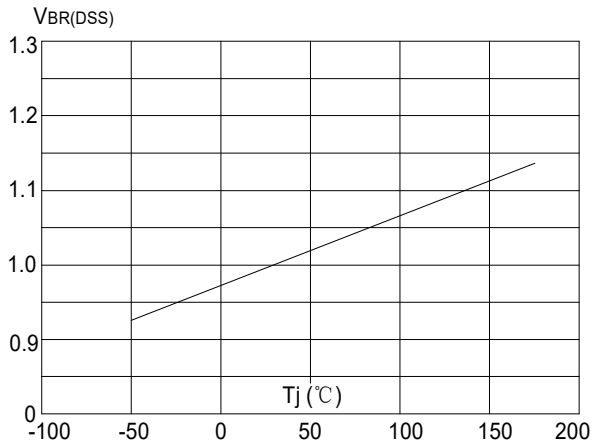


Figure 8: Normalized on Resistance vs. Junction Temperature

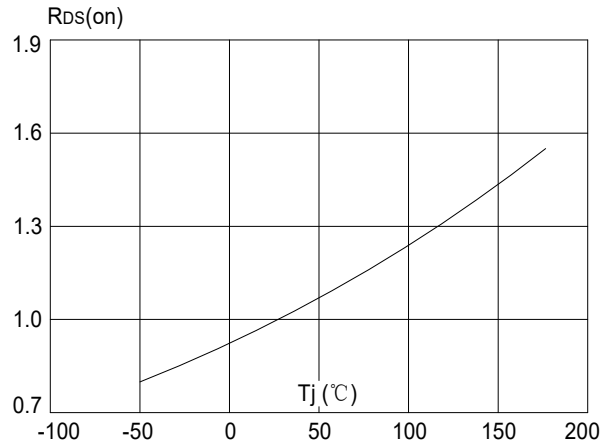


Figure 9: Maximum Safe Operating Area

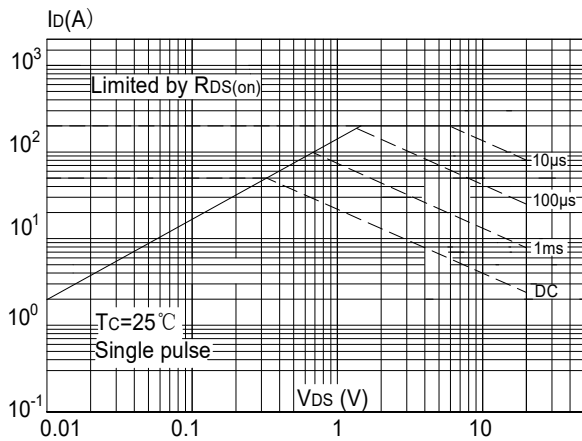


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

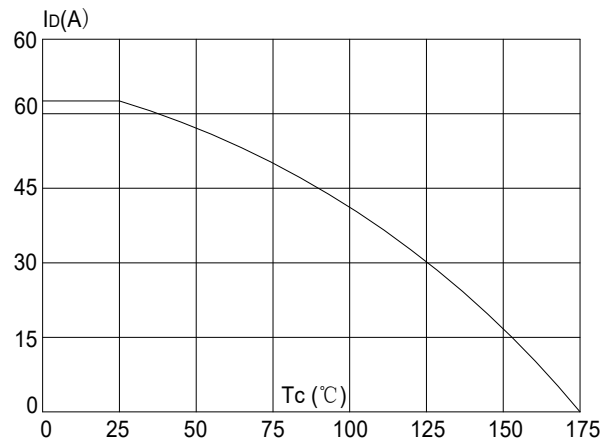
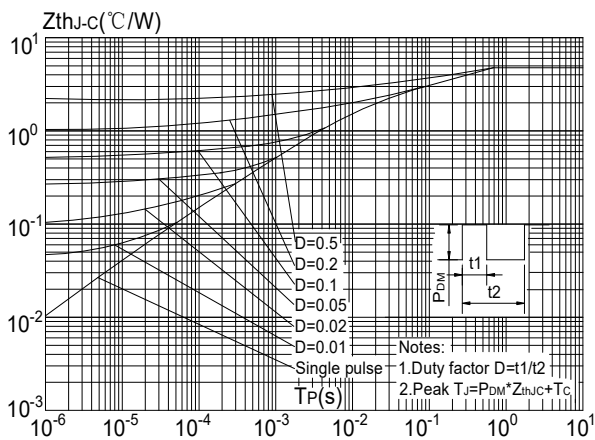
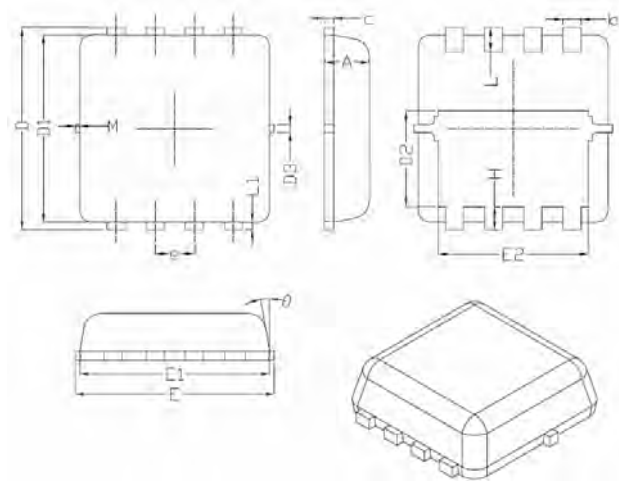


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



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
FDMC8554-MS	DFN3X3-8L	5000

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