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SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

SI7414DN-T1-E3-MS

Product specification

Description

The SI7414DN-T1-E3-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.

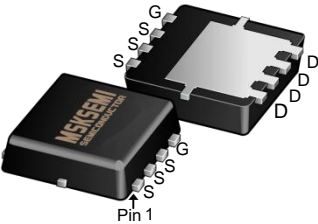
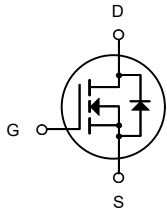

Features

- $V_{DS} = 60V$ $I_D = 20A$
- $R_{DS(ON)} < 30m\Omega$ @ $V_{GS} = 10V$

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	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_c = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	20	A
$I_D @ T_c = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	14	A
IDM	Pulsed Drain Current ²	90	A
EAS	Single Pulse Avalanche Energy ³	42	mJ
$P_D @ T_c = 25^\circ C$	Total Power Dissipation ⁴	33	W
TSTG	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	3.79	$^\circ C/W$

Electrical Characteristics (T_J=25 , unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	60	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{GS} =0V, V _{DS} =60V	---	---	1	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0A	---	---	±100	nA
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	1.2	1.8	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V, I _D =20A	---	24	30	mΩ
		V _{GS} =4.5V, I _D =20A	---	31	40	
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	---	1060	---	pF
C _{oss}	Output Capacitance		---	64	---	
C _{rss}	Reverse Transfer Capacitance		---	54	---	
t _{d(on)}	Turn-On Delay Time	V _{DD} =30V , V _{GS} =10V , I _D =20A, R _G = 3Ω	---	8.4	---	ns
t _r	Rise Time		---	8.5	---	ns
t _{d(off)}	Turn-Off Delay Time		---	36	---	ns
t _f	Fall Time		---	5	---	ns
Q _g	Total Gate Charge	V _{DS} =30V , V _{GS} =10V , I _D =20A	---	26	---	nC
Q _{gs}	Gate-Source Charge		---	5.7	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	5.2	---	nC
I _S	Continuous Source Current	V _G =V _D =0V	---	---	20	A
I _{SM}	Pulsed Source Current	V _G =V _D =0V	---	---	90	A
V _{SD}	Forward on voltage	I _S =20A, V _{GS} =0V	---	---	1.2	V
T _{rr}	Body Diode Reverse Recovery Time	I _F =20A, dI/dt=100A/μs	---	18	---	nS
Q _{rr}	Body Diode Reverse Recovery Charge		---	13	---	nC

Notes:

1. L=0.5mH, V_{DD}=30V, Start T_J=25°C.
2. Limited by maximum junction temperature.
- 3.Repetitive Rating: Pulse width limited by maximum junction temperature

Typical Characteristics

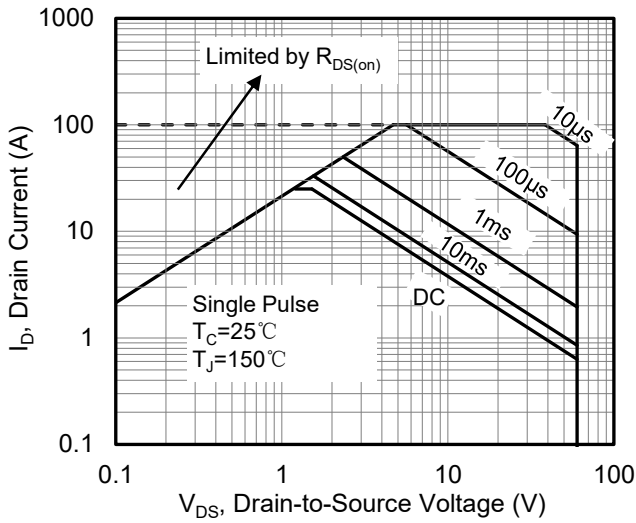


Figure 1. Maximum Safe Operating Area

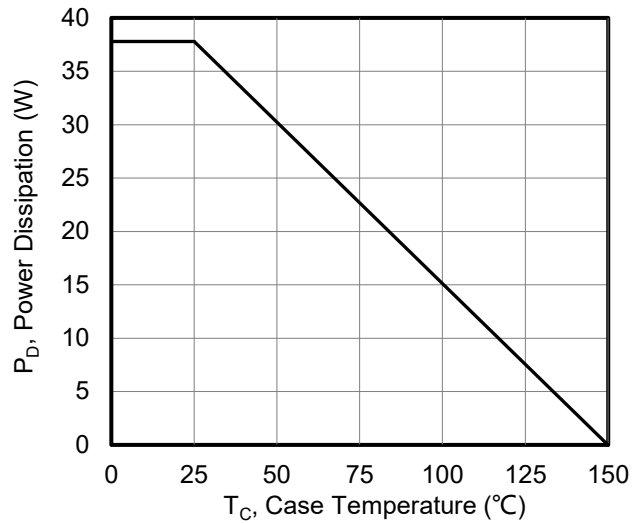


Figure 2. Maximum Power Dissipation vs. Case Temperature

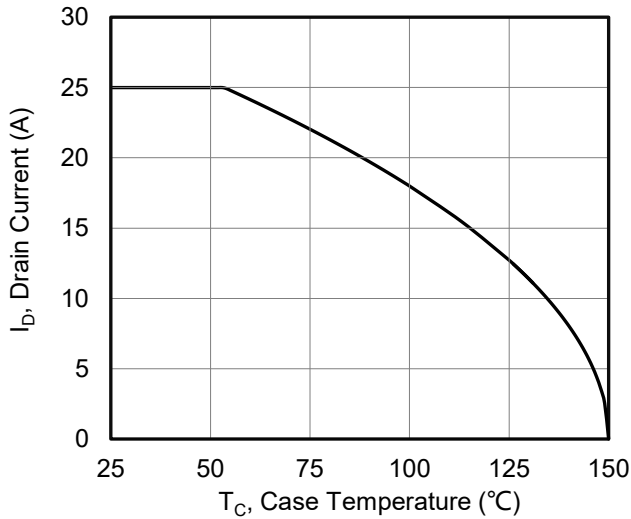


Figure 3. Maximum Continuous Drain Current vs. Case Temperature

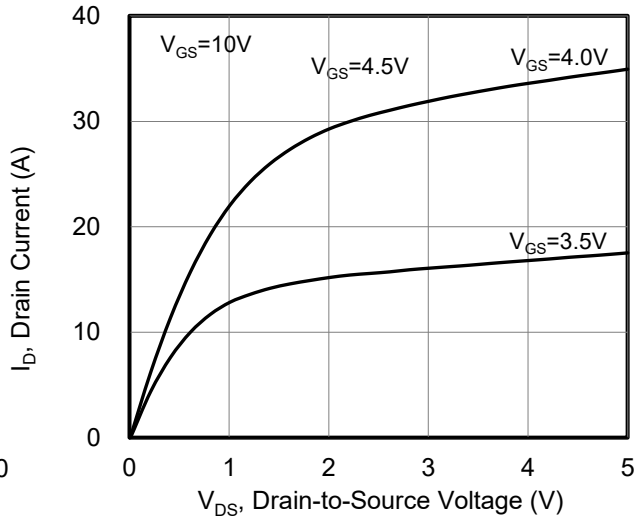


Figure 4. Typical output Characteristics

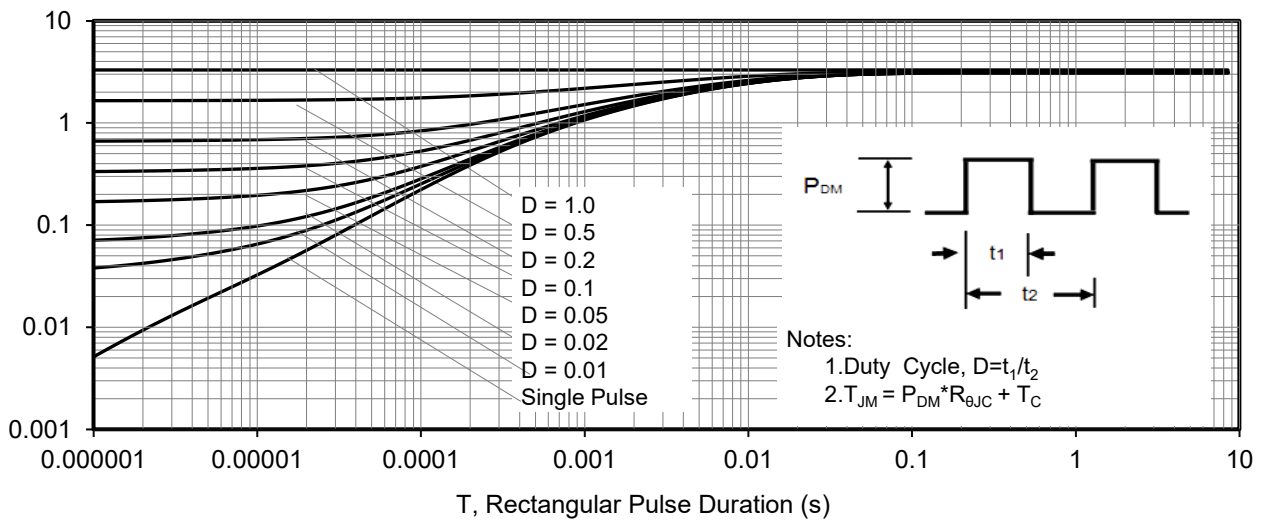


Figure 5. Maximum Effective Thermal Impedance, Junction to Case

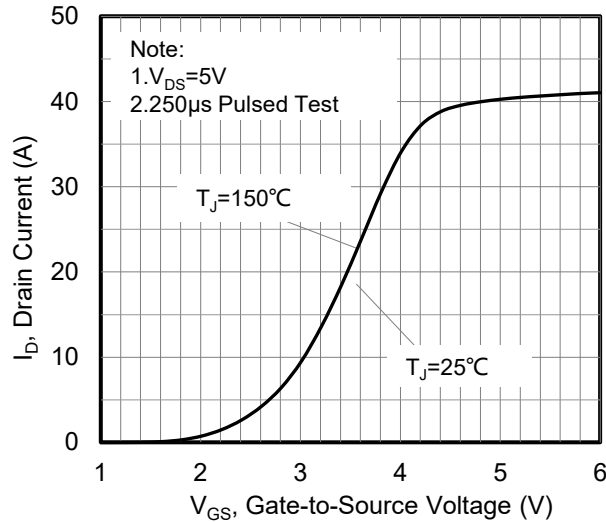


Figure 6. Typical Transfer Characteristics

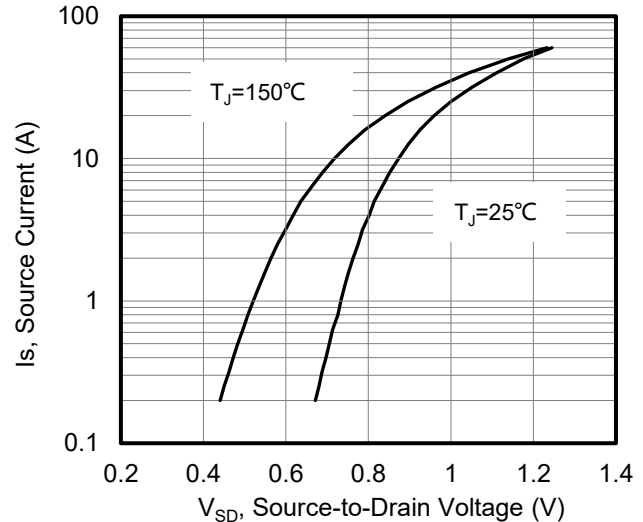


Figure 7. Typical Body Diode Transfer Characteristics

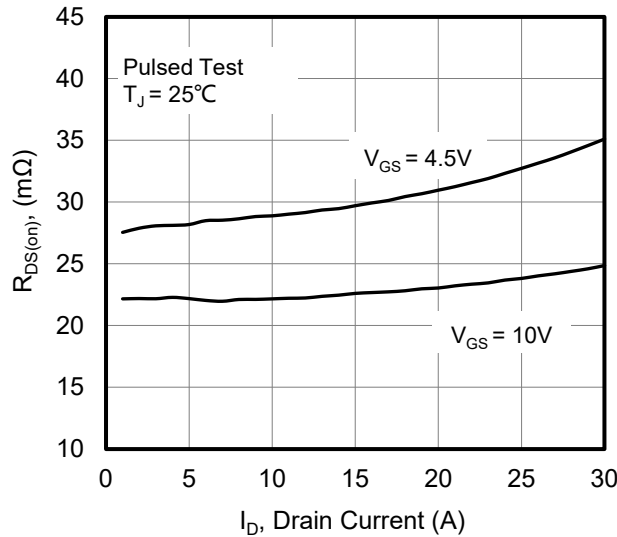


Figure 8. Drain-to-Source On Resistance vs Drain Current

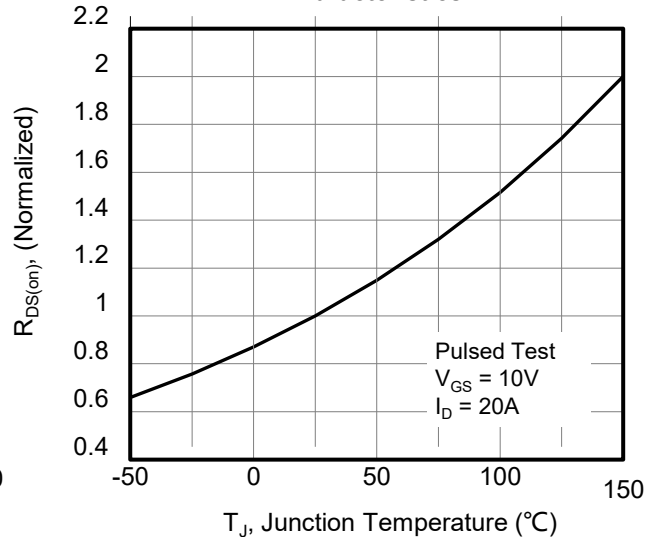


Figure 9. Normalized On Resistance vs Junction Temperature

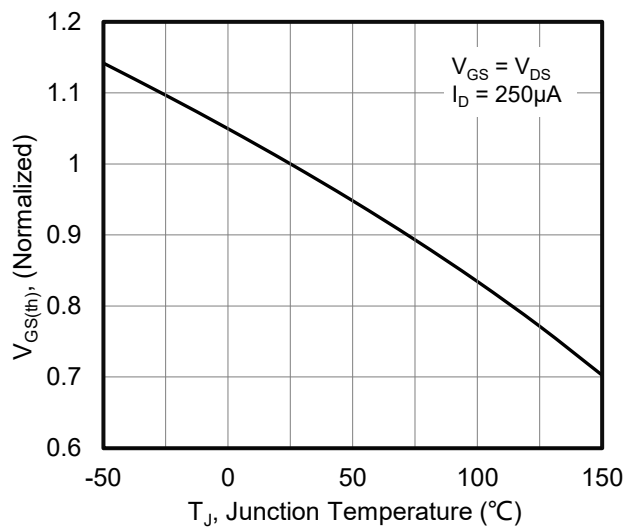


Figure 10. Normalized Threshold Voltage vs Junction Temperature

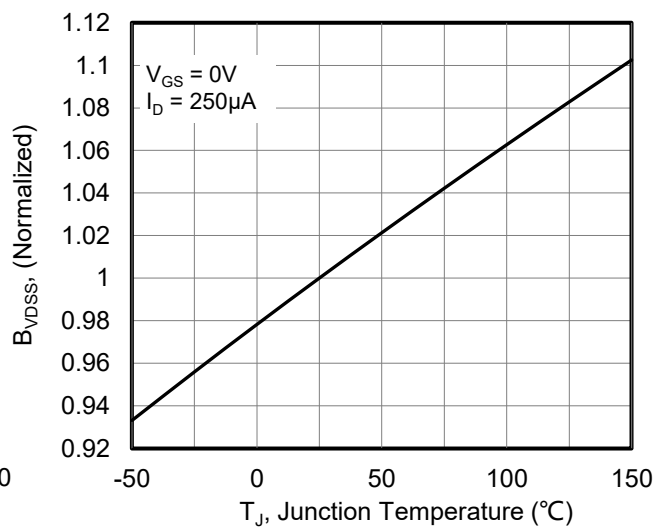


Figure 11. Normalized Breakdown Voltage vs Junction Temperature

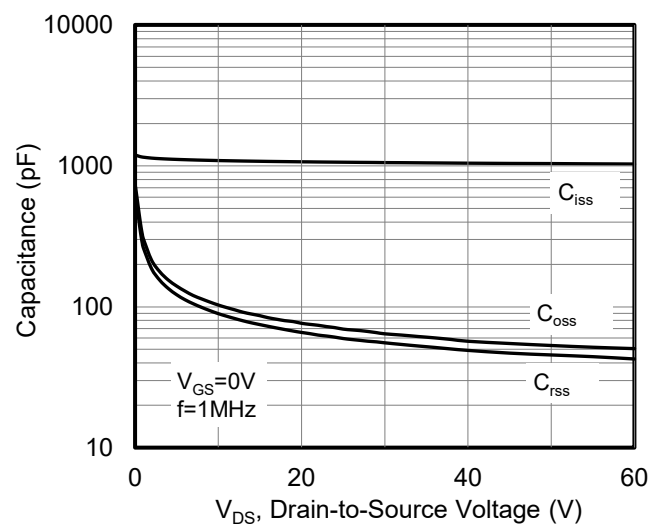


Figure 12. Capacitance Characteristics

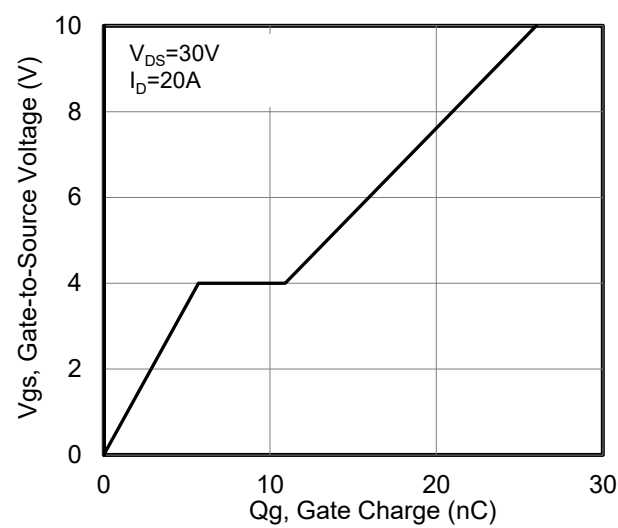
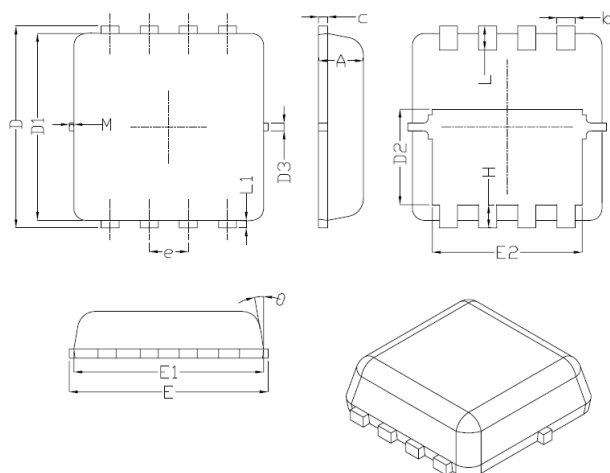


Figure 13. Typical Gate Charge vs Gate to Source Voltage

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
SI7414DN-T1-E3-MS	DFN3X3-8L	5000

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