

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

## SI7106DN-T1-E3-MS

Product specification

## Description

The SI7106DN-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.

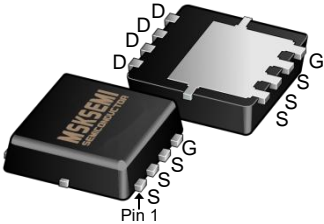
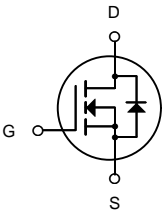

## Features

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

## 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	$\pm 12$	V
$I_D @ T_c = 25^\circ C$	Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup>	60	A
$I_D @ T_c = 100^\circ C$	Continuous Drain Current, $V_{GS}$ @ 10V <sup>1</sup>	33	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	220	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	46	mJ
$I_{AS}$	Avalanche Current	25	A
$P_D @ T_c = 25^\circ C$	Total Power Dissipation <sup>4</sup>	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 <sup>1</sup>	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	4.5	$^\circ C/W$

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

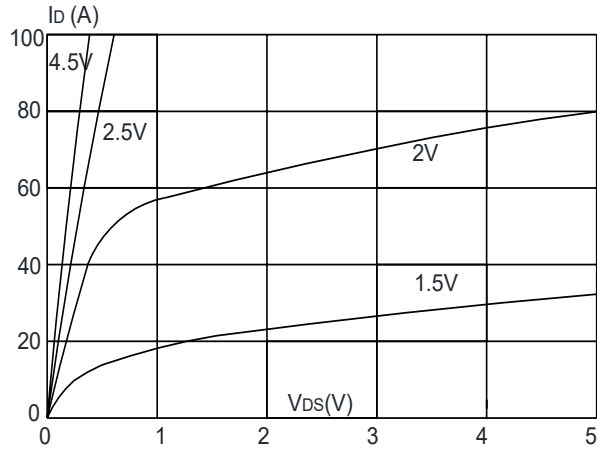
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V,$	-	-	1.0	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$	-	-	$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4	0.7	1.1	V
$R_{DS(on)}$ <small>note3</small>	Static Drain-Source on-Resistance	$V_{GS}=4.5V, I_D=30A$	-	4.0	5	m $\Omega$
		$V_{GS}=2.5V, I_D=20A$	-	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:**

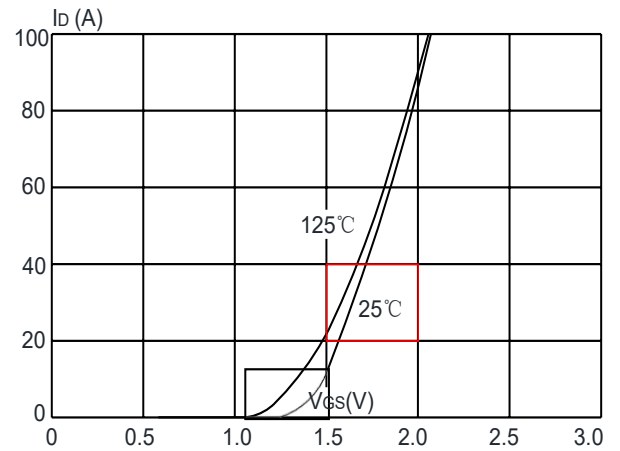
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition:  $T_J=25^{\circ}\text{C}$ ,  $V_{DD}=10V$ ,  $V_G=4.5V$ ,  $L=0.5mH$ ,  $R_G=25\Omega$ ,  $I_{AS}=15A$
3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$

## Typical Performance Characteristics

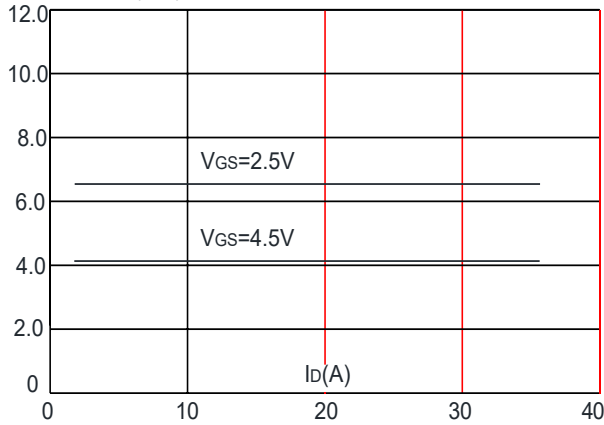
**Figure 1: Output Characteristics**



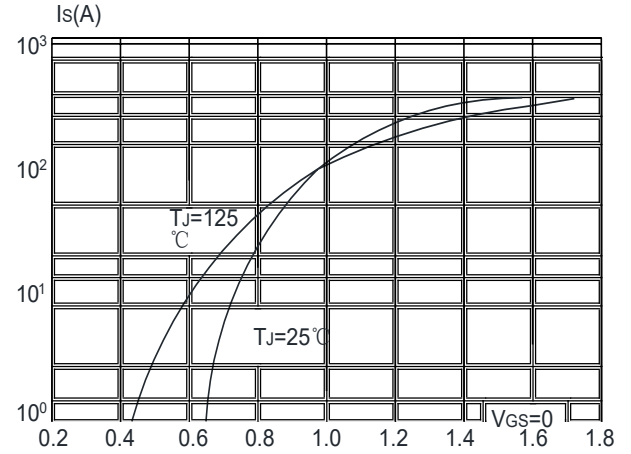
**Figure 2: Typical Transfer Characteristics**



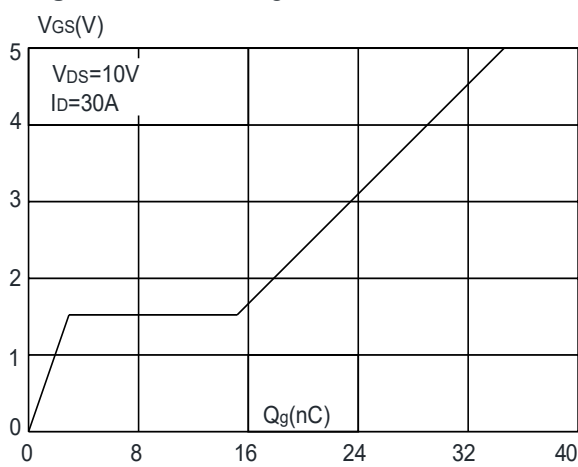
**Figure 3: On-resistance vs. Drain Current**



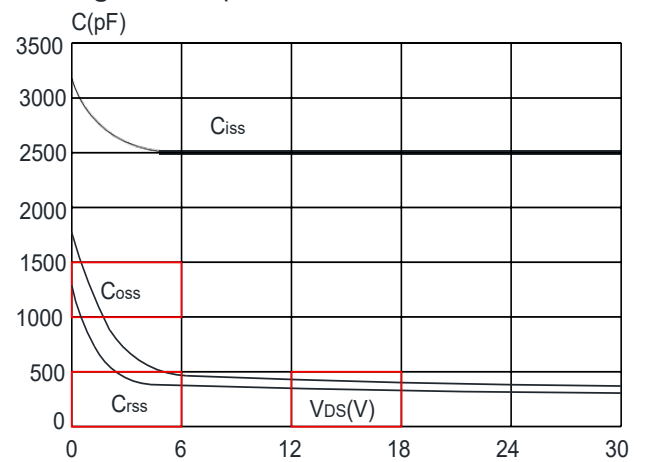
**Figure 4: Body Diode Characteristics**



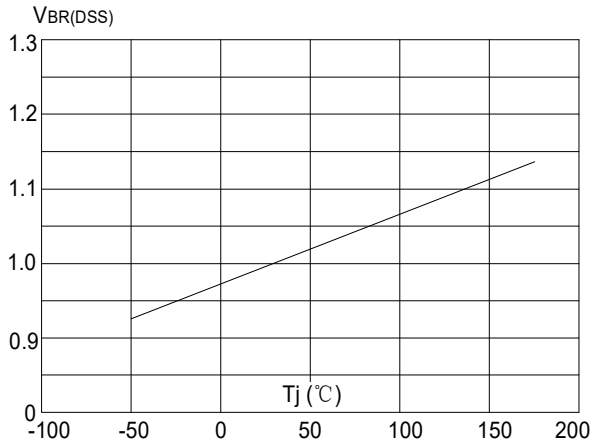
**Figure 5: Gate Charge Characteristics**



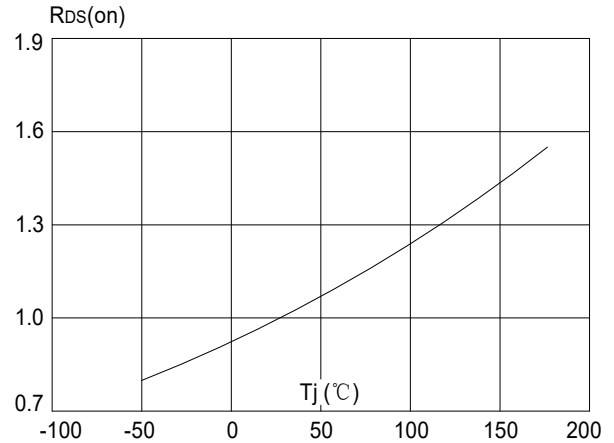
**Figure 6: Capacitance Characteristics**



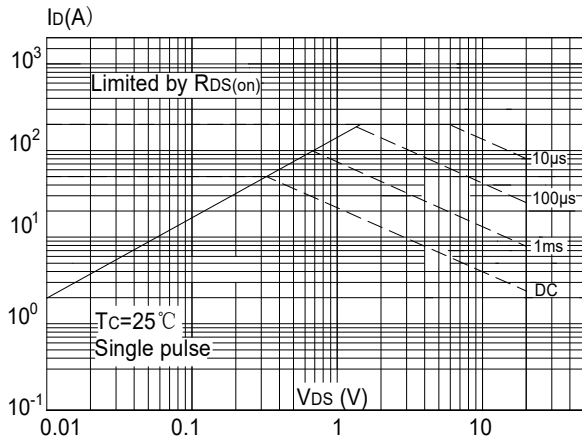
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



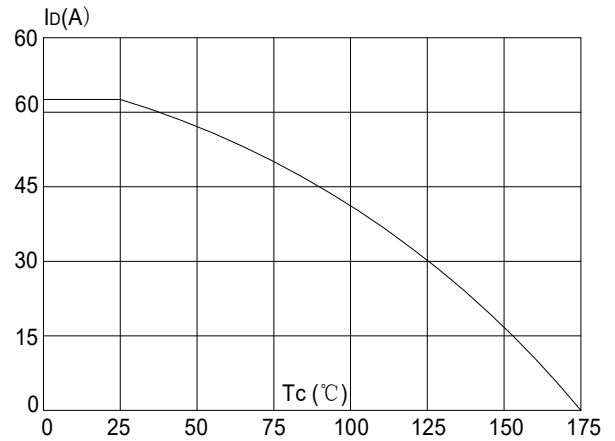
**Figure 8:** Normalized on Resistance vs. Junction Temperature



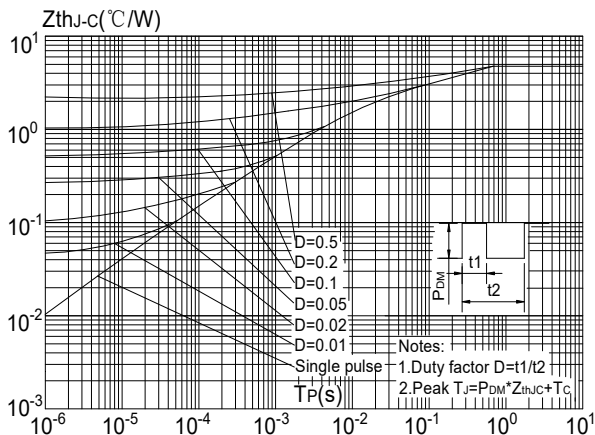
**Figure 9:** Maximum Safe Operating Area



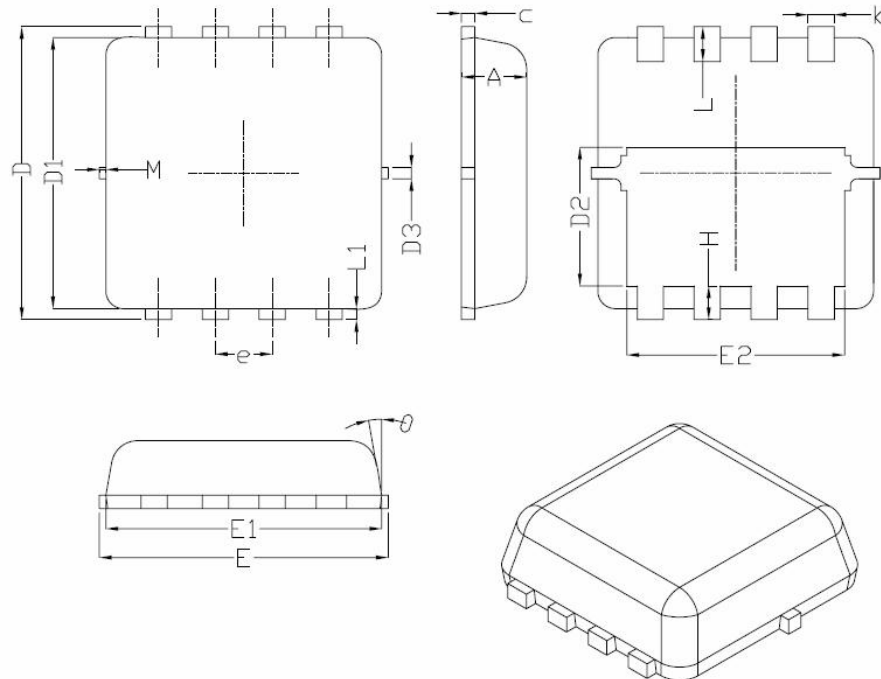
**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



**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
SI7106DN-T1-E3-MS	DFN3X3-8L	5000

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