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SEMICONDUCTOR



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CSD25402Q3A-MS

Product specification

Description

The CSD25402Q3A-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.

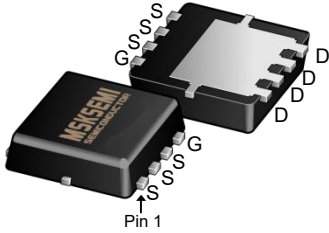
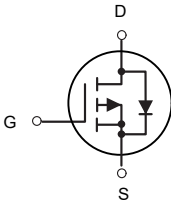

Features

- $V_{DS} = -20V$ $I_D = -60A$
- $R_{DS(ON)} < 10m\Omega$ @ $V_{GS} = -4.5V$

Application

- Battery protection
- Load switch
- Uninterruptible power supply

Reference News

DFN3X3-8L	P-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	-30	A
IDM	Pulsed Drain Current ²	-78	A
$P_D@T_c=25^\circ C$	Total Power Dissipation ⁴	22	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	75	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	4.2	$^\circ C/W$

Electrical Characteristics (T_J=25℃ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =-250uA	-20	---	---	V
ΔB _V DSS/ΔT _J	B _V 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
ΔV _{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} =±12 V , V _{DS} =0V	---	---	±100	nA
g _{fs}	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	---	
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 =25℃	---	---	-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-10A ,	---	27	---	nS
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs , T _J =25℃	---	17.8	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The power dissipation is limited by 150℃ junction temperature
- 4.The data is theoretically the same as I_D and I_{DM}, in real applications , should be limited by total power dissipation.

Typical Characteristics

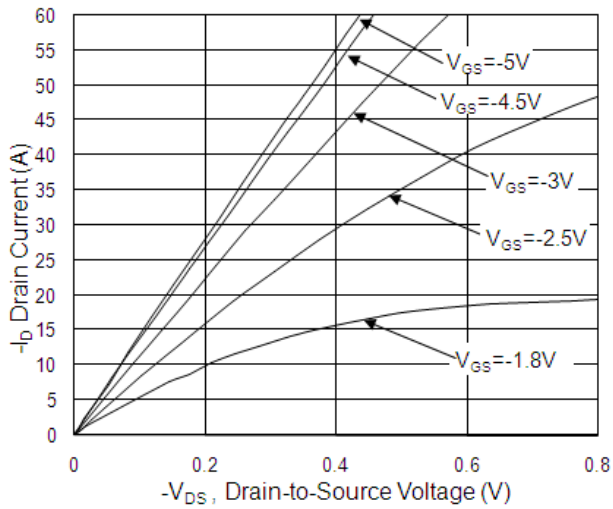


Fig.1 Typical Output Characteristics

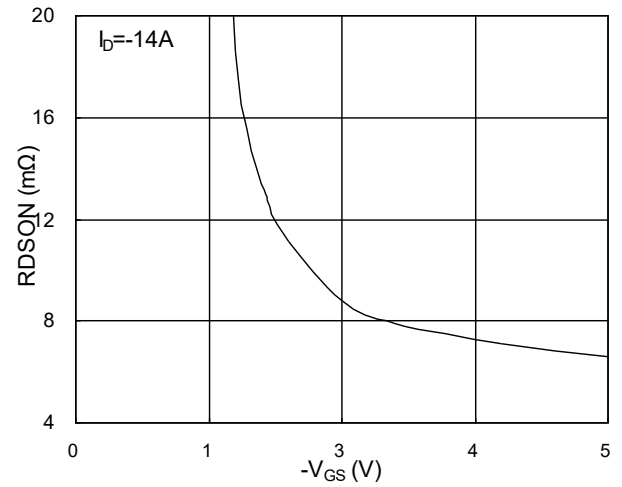


Fig.2 On-Resistance vs. G-S Voltage

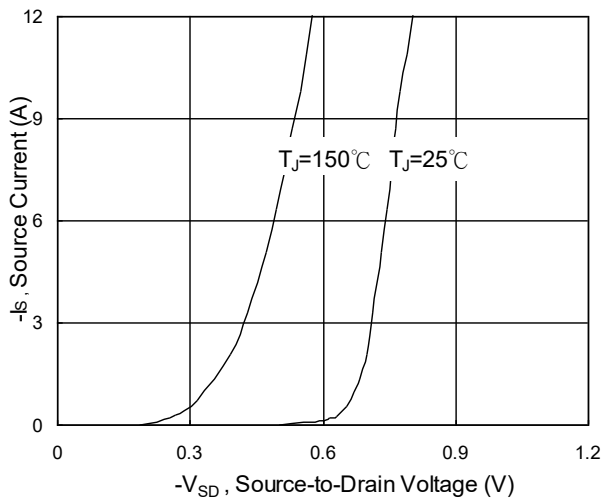


Fig.3 Forward Characteristics of Reverse

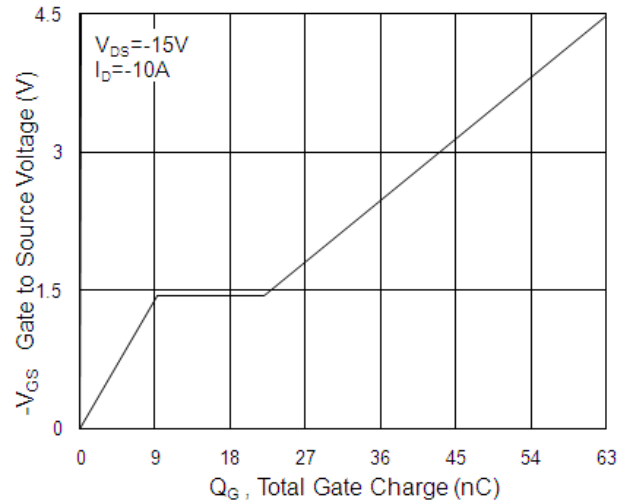


Fig.4 Gate-charge Characteristics

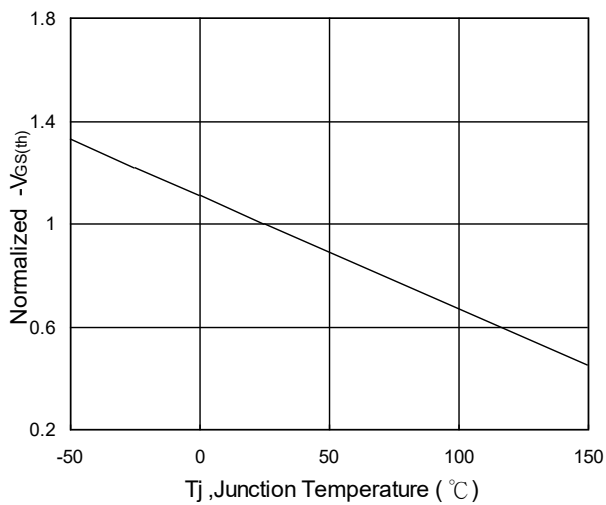


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

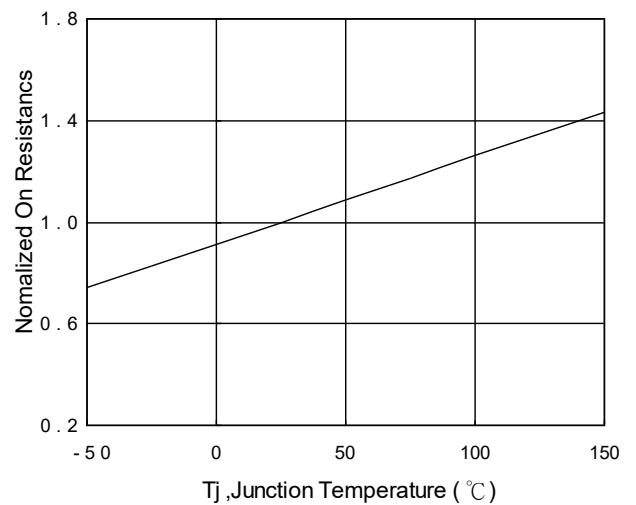


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

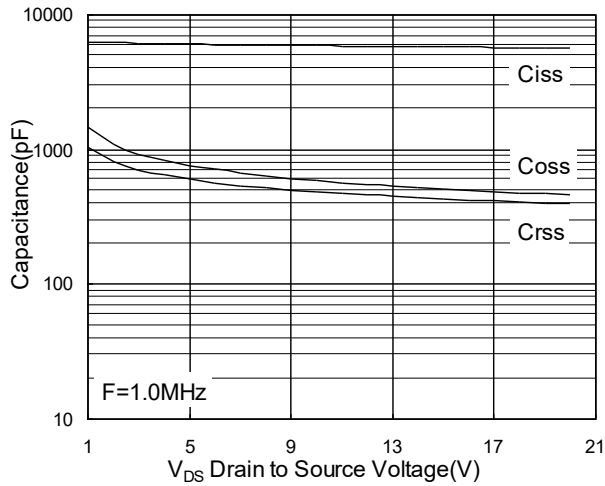


Fig.7 Capacitance

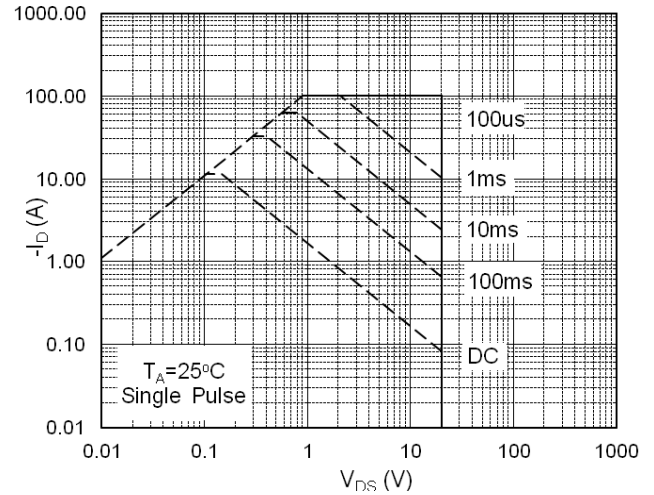


Fig.8 Safe Operating Area

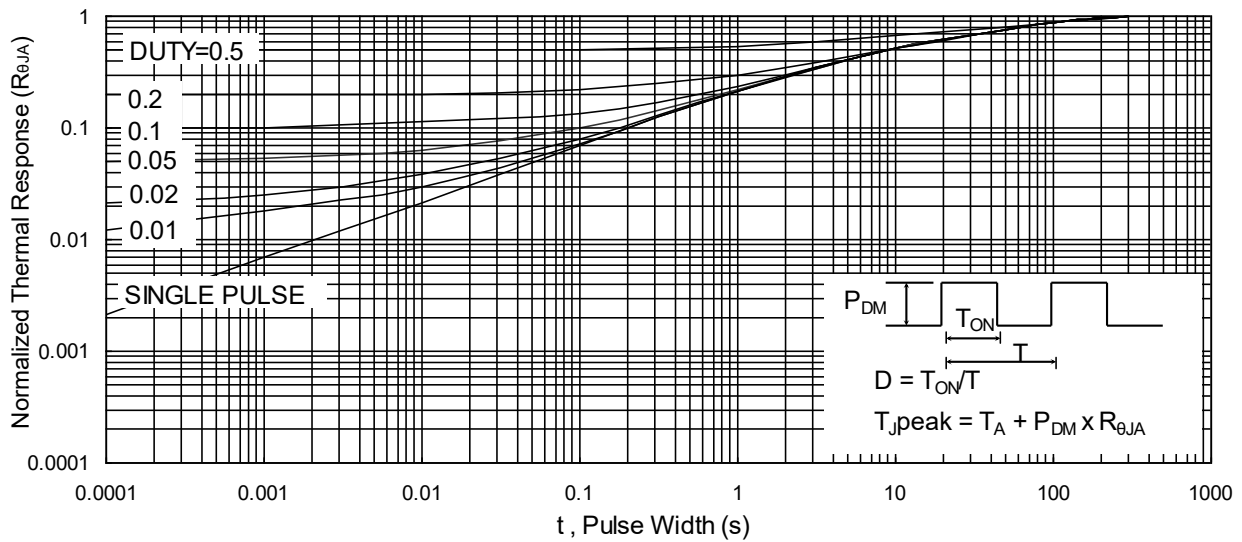


Fig.9 Normalized Maximum Transient Thermal Impedance

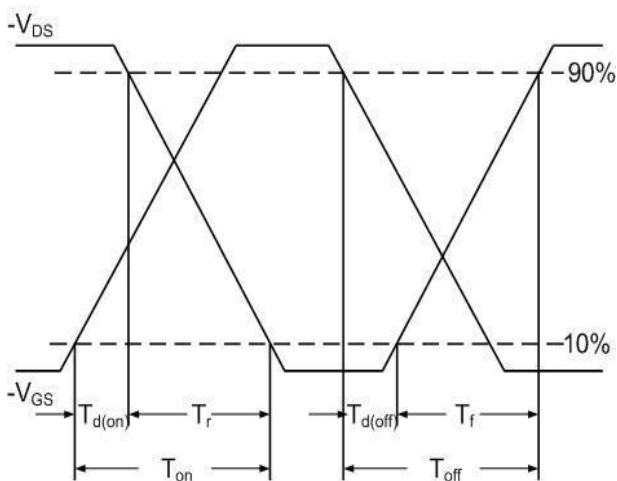


Fig.10 Switching Time Waveform

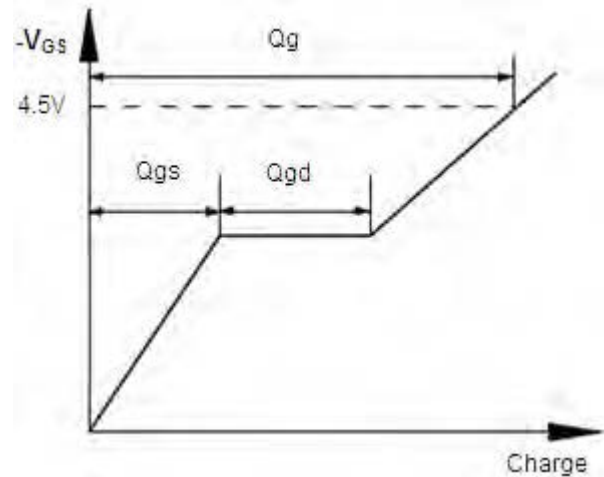
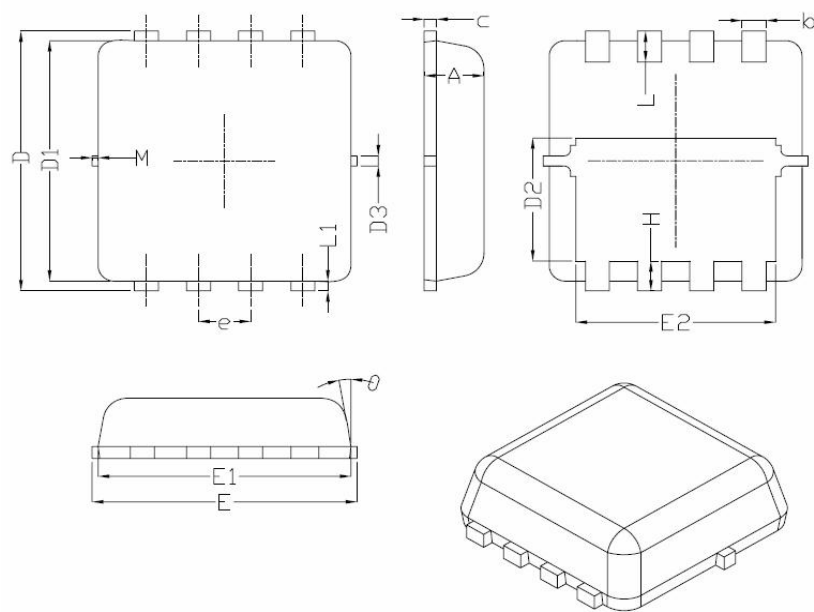


Fig.11 Gate Charge Waveform

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
CSD25402Q3A-MS	DFN3X3-8L	5000

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