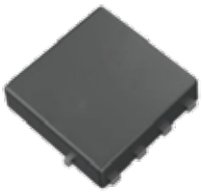
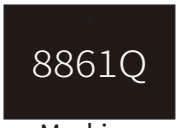
FEATURES

- Low $R_{DS(ON)}$ to minimize conductive loss
- High GOX reliability
- Low Thermal resistance
- Meet AEC-Q101 Requirements



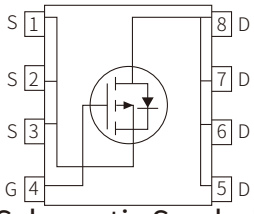
PDFN3x3-8L



Marking

APPLICATION

- BLDC Motor driver
- DC-DC
- Load Switch



Schematic Symbol

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage ①		V_{GS}	±20	V
Drain Current - Continuous	T_C=25°C	I_D	-13	A
	T_C=75°C		-12	A
	T_C=100°C		-10	A
Pulsed Drain Current Pulsed; tp ⩽ 10 µs; Tmb = 25 °C		I_{DM}	-52	A
Total Power Dissipation	T_C=25°C	P_D	30	W
	T_A=25°C		2.5	W
Single Pulse Avalanche Energy L=0.1mH, V_{GS}=-10V, Rg=25Ω,		E_{AS}	30	mJ
Single Pulse Avalanche Energy L=0.5mH, V_{GS}=-10V, Rg=25Ω			54	mJ
Thermal resistance, junction - case		R_{thJC}	5	°C/W
Thermal resistance, junction-ambient ②		R_{thJA}	60	°C/W
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 to 175	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=-250μA	-60			V
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			100	nA
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-60V,V_{GS}=0V			1.0	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1.3	-1.8	-2.5	V
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_{SD}=-4A		20		S
Static Drain-source On Resistance	$R_{DS(on)}$	V_{GS}=-10V,I_{DS}=-1A		48	60	mΩ
		V_{GS}=-4.5V,I_{DS}=-1A		60	81	mΩ
Diode Forward Voltage	V_{FSD}	V_{GS}=0V,I_{SD}=-10A			1.3	V
Input Capacitance	C_{iss}	V_{DS}=-25V,f=1MHz		1380		pF
Output Capacitance	C_{oss}			101		pF
Reverse Transfer Capacitance	C_{rss}			67		pF
Gate resistance	R_g	f=1.0MHz		8		Ω
Turn–on Delay Time	$t_{d(on)}$	V_{DS}=-15V,R_G=3.3Ω V_{GS}=-10V,I_D=-10A		17		ns
Turn–on Rise Time	t_r			18		ns
Turn–Off Delay Time	$t_{d(off)}$			43		ns
Turn–off Fall Time	t_f			20		ns
Total Gate Charge	Q_g	V_{DD}=-15V,I_D=-10A V_{GS}=-10V		20		nC
	$Q_{g(-4.5V)}$			9		nC
Gate-Source Charge	Q_{gs}			3.5		nC
Gate-Drain Charge	Q_{gd}			3.6		nC

Note:

① Pulse : V_{GS}=+20V/-20V, Duty cycle=50%,T_j=175°C, t=1000 hours; For DC , the following test conditions can be passed: V_{GS}=-20V/+10V, T_j=175°C, t=1000 hours;

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

③Practically the current will be limited by PCB, thermal design and operating temperature. V_{GS}=- 10V.

PARAMETER CHARACTERISTIC CURVE

Figure 1: Gate-Charge Characteristics

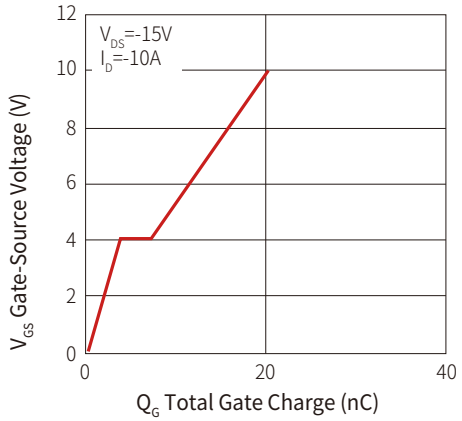


Figure 2: Capacitance Characteristics

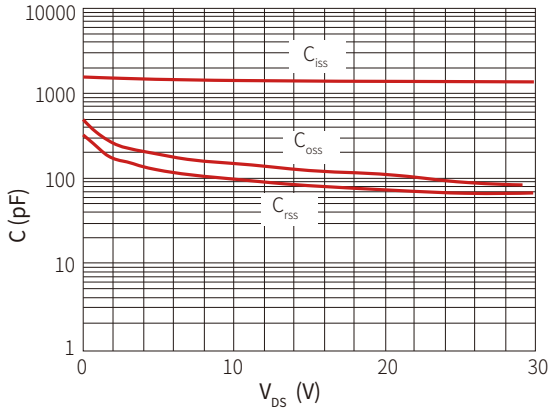


Figure 3: Power Dissipation

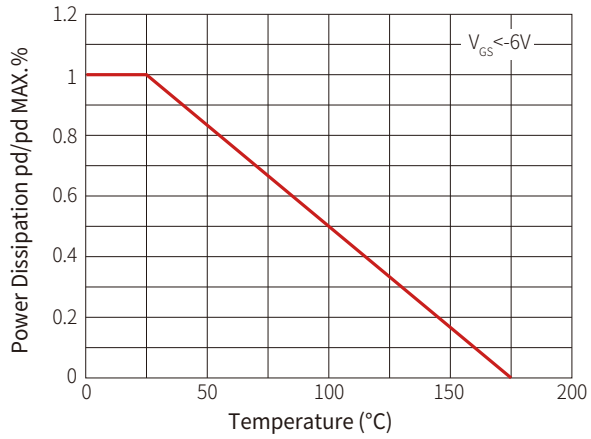


Figure 4: Typical output Characteristics

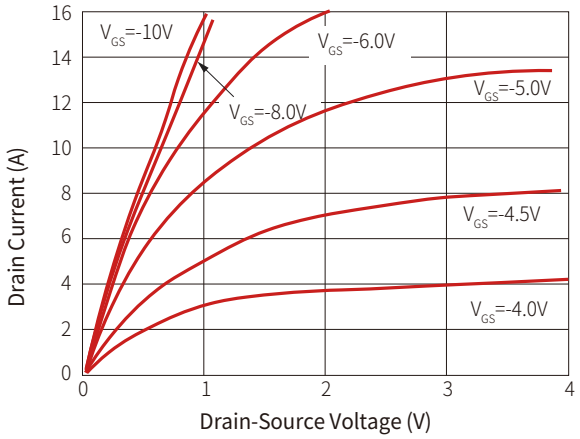


Figure 5: Threshold Voltage V.S Junction Temperature

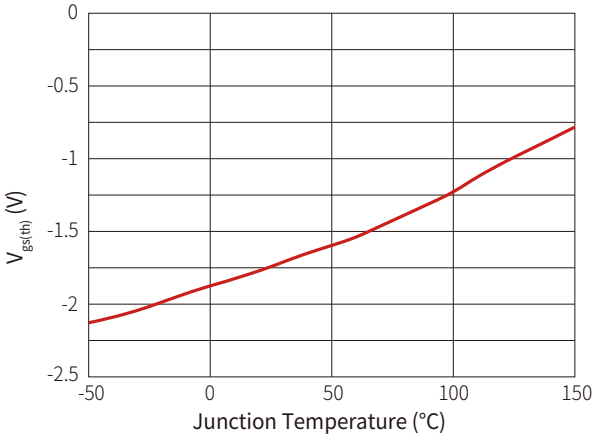


Figure 6: Resistance V.S Drain Current

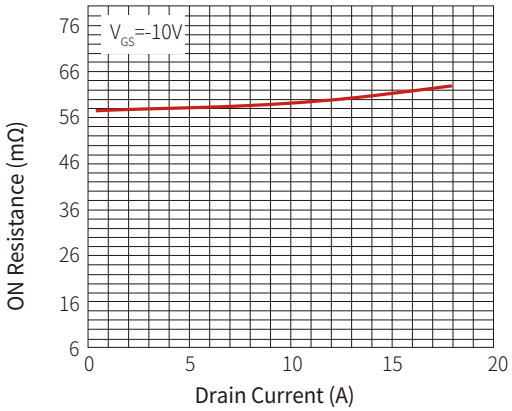


Figure 7: On-Resistance VS Gate Source Voltage

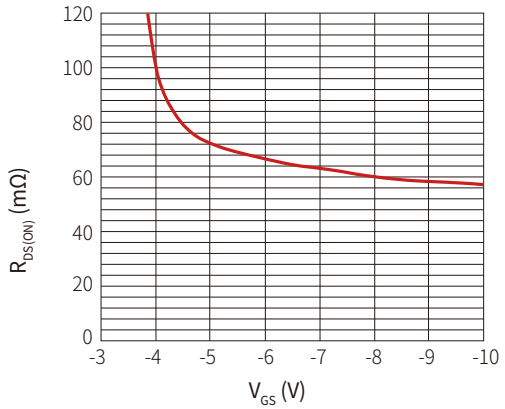


Figure 8: On-Resistance V.S Junction Temperature

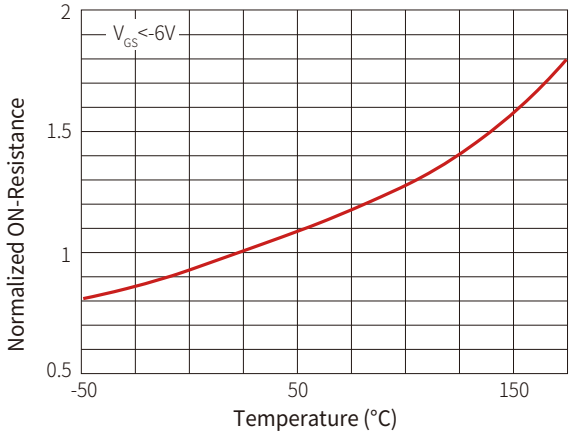


Figure 9: Diode Forward Voltage vs. Current

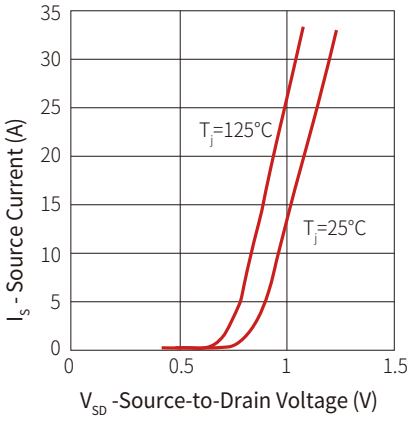


Figure 10: Transfer Characteristics

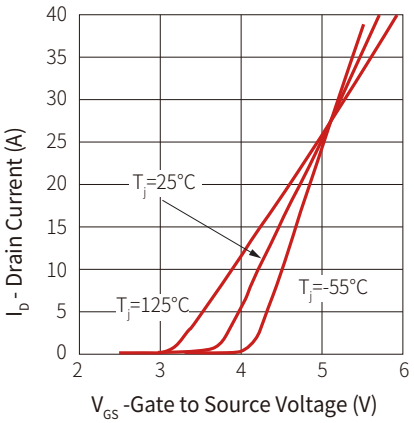


Figure 11: Safe Operating Area

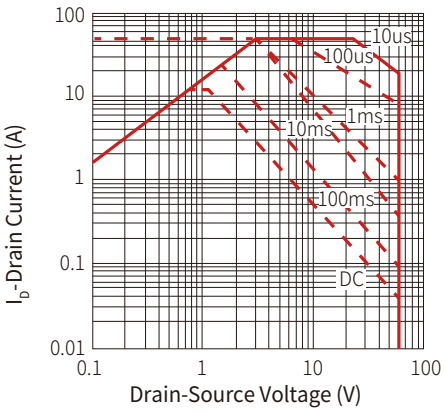
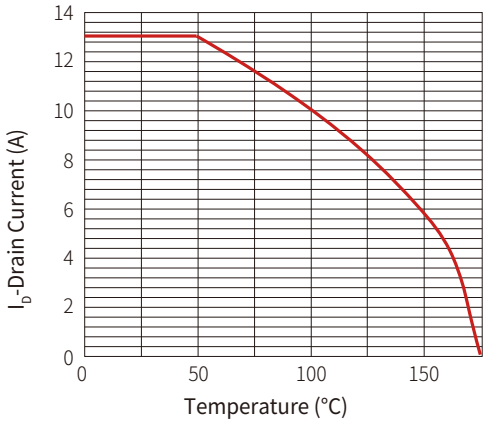
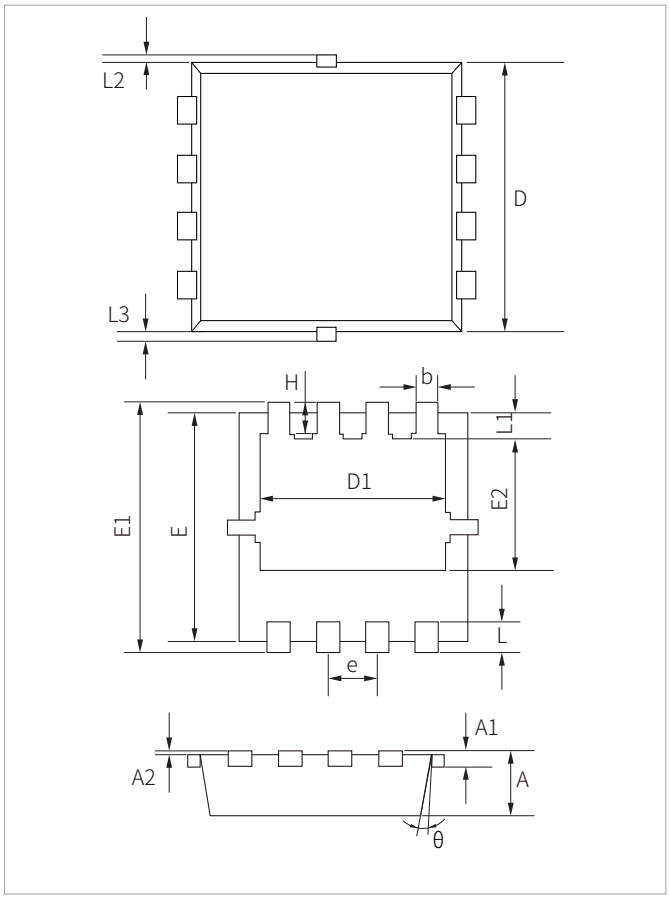


Figure 12: I_D vs. Case Temperature③



PDFN3x3-8L PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152REF		0.006REF	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SPM8861Q	PDFN3x3-8L	5000PCS	13”

Headquarters
No.3387 Shendu Road
Pujiang I&E Park
Minhang Shanghai China
201000

Hotline
400-021-5756

Web
Https://www.semiware.com

Sales Center
Tel: 86-21-3463-7458
Email: sales18@semiware.com

Customer Service
Tel: 86-21-5484-1001
Email: sales17@semiware.com

Technical Support
Tel: 86-21-3463-7654
Email: fae01@semiware.com

Complaint & Suggestions
Tel: 86-21-3463-7172
Ext: 8868
Email: cs03@semiware.com

By QR Code
Website
Wechat

To find your local partner within Semiware' s global website: www.semiware.com