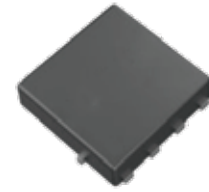


## FEATURES

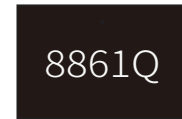
- | Low  $R_{DS(ON)}$  to minimize conductive loss
- | High GOX reliability
- | Low Thermal resistance
- | Meet AEC-Q101 Requirements



PDFN3x3-8L

## APPLICATION

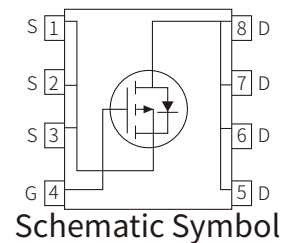
- | BLDC Motor driver
- | DC-DC
- | Load Switch



Marking

## APPROVALS

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



## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	$V_{DS}$	-60	V	
Gate-Source Voltage <sup>①</sup>	$V_{GS}$	±20	V	
Drain Current - Continuous	$I_D$	$T_C=25^{\circ}\text{C}$	-13	A
		$T_C=75^{\circ}\text{C}$	-12	A
		$T_C=100^{\circ}\text{C}$	-10	A
Pulsed Drain Current Pulsed; $t_p \leq 10 \mu\text{s}$ ; $T_{mb} = 25^{\circ}\text{C}$		$I_{DM}$	-52	A
Total Power Dissipation	$P_D$	$T_C=25^{\circ}\text{C}$	30	W
		$T_A=25^{\circ}\text{C}$	2.5	W
Single Pulse Avalanche Energy $L=0.1\text{mH}$ , $V_{GS}=-10\text{V}$ , $R_g=25\Omega$ ,	$E_{AS}$	30	mJ	
Single Pulse Avalanche Energy $L=0.5\text{mH}$ , $V_{GS}=-10\text{V}$ , $R_g=25\Omega$		54	mJ	
Thermal resistance, junction - case	$R_{thJC}$	5	$^{\circ}\text{C}/\text{W}$	
Thermal resistance, junction-ambient <sup>②</sup>	$R_{thJA}$	60	$^{\circ}\text{C}/\text{W}$	
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 175	$^{\circ}\text{C}$	

## ELECTRICAL CHARACTERISTICS (Ta=25°C )

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60			V
Gate- Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			100	nA
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V$			1.0	$\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-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	m $\Omega$
		$V_{GS}=-4.5V, I_{DS}=-1A$		60	81	m $\Omega$
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		$\Omega$
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=-15V, R_g=3.3\Omega$ $V_{GS}=-10V, I_D=-10A$		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	
	$Q_{g(4.5V)}$			9		nC
Gate-Source Charge	$Q_{gs}$			3.5		nC
Gate-Drain Charge	$Q_{gd}$			3.6		nC

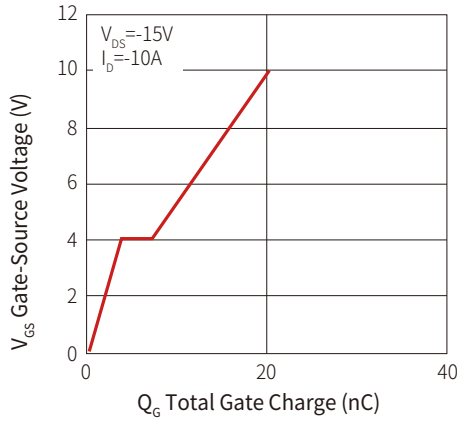
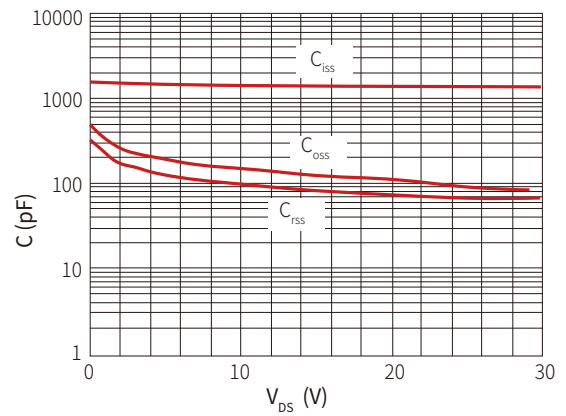
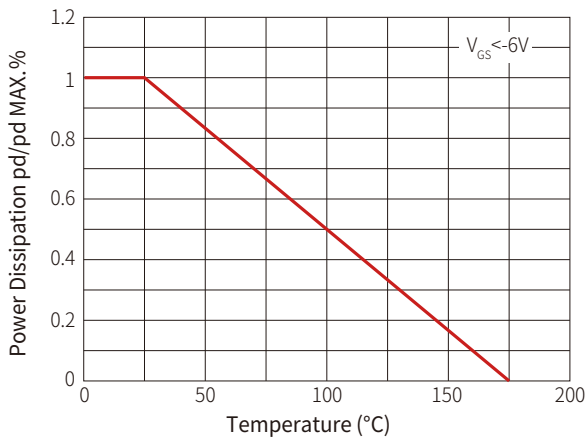
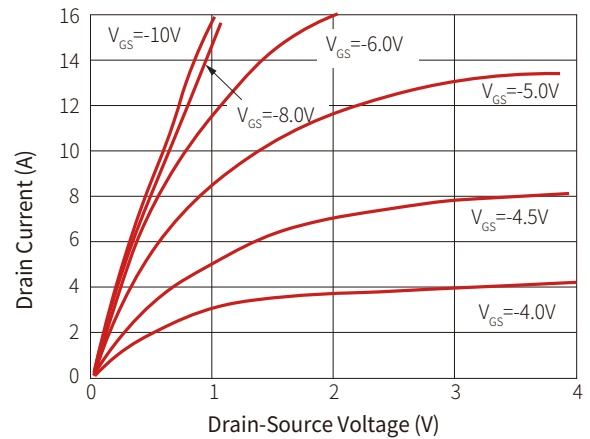
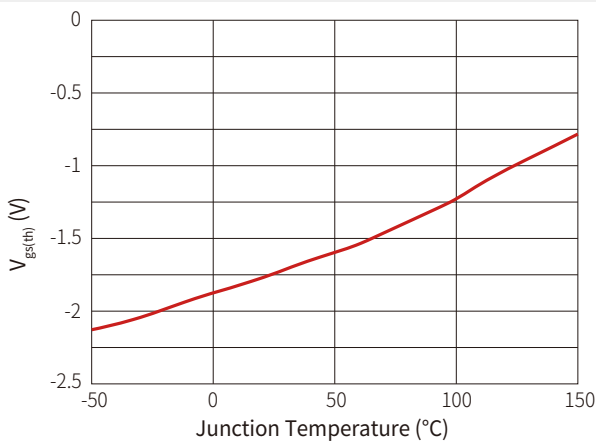
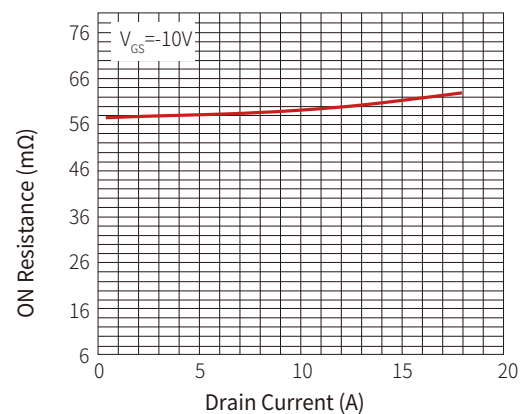
Note:

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

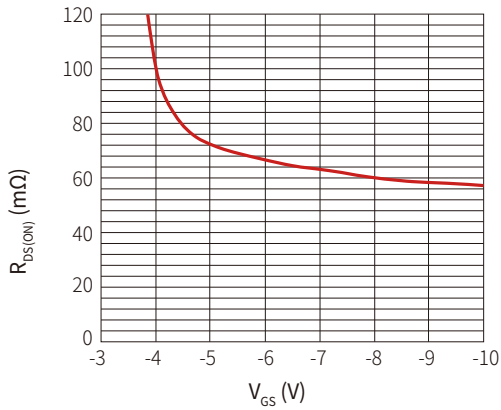
② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

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

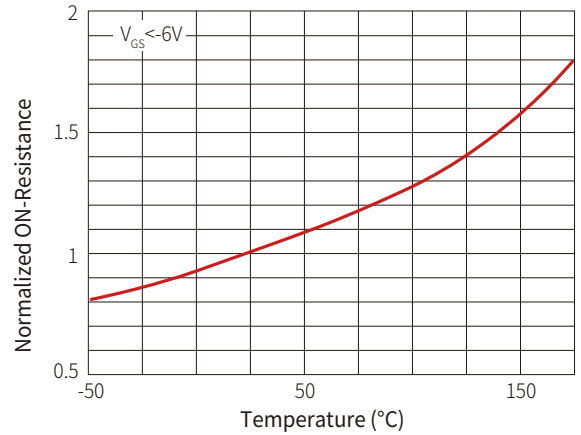
# PARAMETER CHARACTERISTIC CURVE

**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**


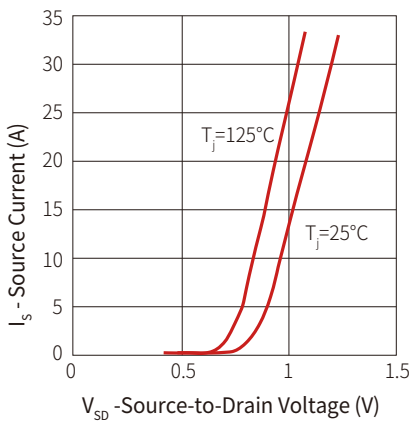
**Figure 7: On-Resistance VS Gate Source Voltage**



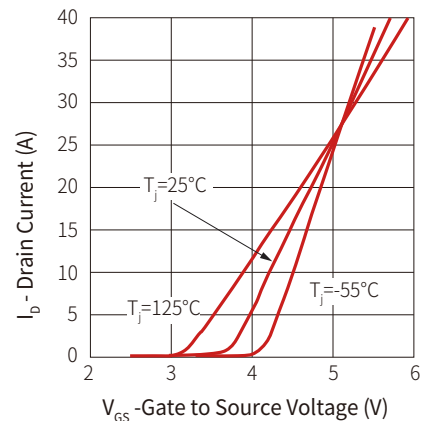
**Figure 8: On-Resistance V.S Junction Temperature**



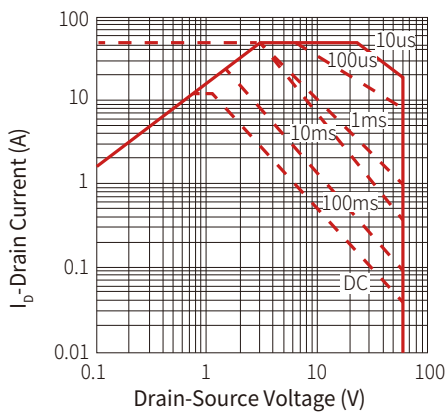
**Figure 9: Diode Forward Voltage vs. Current**



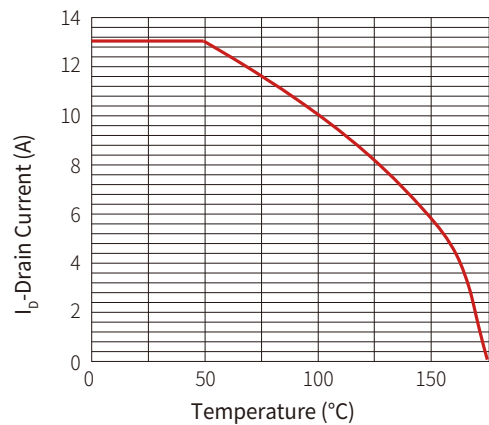
**Figure 10: Transfer Characteristics**



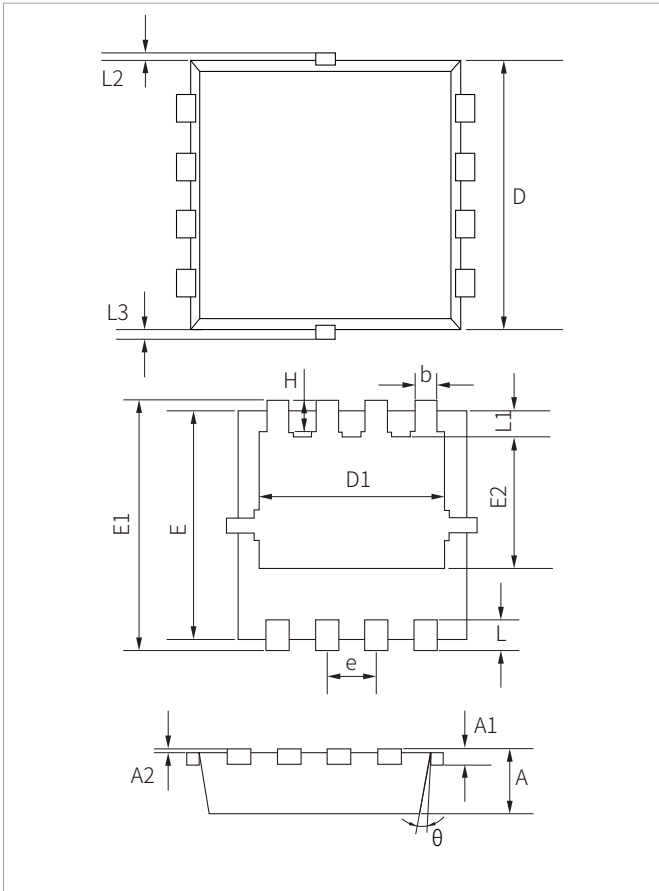
**Figure 11: Safe Operating Area**



**Figure 12: I<sub>D</sub> vs. Case Temperature<sup>③</sup>**



## 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"

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