

## FEATURES

- | TrenchFET® Power MOSFET

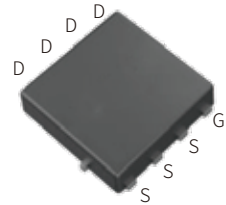
---

- | Package with Low Thermal Resistance

---

- | 100 % Rg and UIS Tested

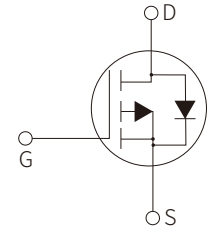
---

PDFN3×3-8L

## APPROVALS

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



Schematic Symbol

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	$V_{DS}$	-30	V
Pulsed Drain Current	$I_{DM}$	-160	A
Continuous Drain Current <sup>a</sup>	$I_D$	$T_c = 25^\circ\text{C}$	-40
		$T_c = 125^\circ\text{C}$	-24
Power Dissipation <sup>b</sup> $T_c = 25^\circ\text{C}$	$P_D$	-36	W
Gate-to-Source Voltage	$V_{GS}$	$\pm 20$	V
Junction & Storage Temperature Range	$T_J, T_{STG}$	-55 to 175	$^\circ\text{C}$
Junction-to-Ambient PCB Mount <sup>c</sup>	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Junction-to-Case (Drain)	$R_{\theta JC}$	1	$^\circ\text{C}/\text{W}$

**Notes**

- a. Package limited.
- b. Pulse test; pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .
- c. When mounted on 1" square PCB (FR-4 material).

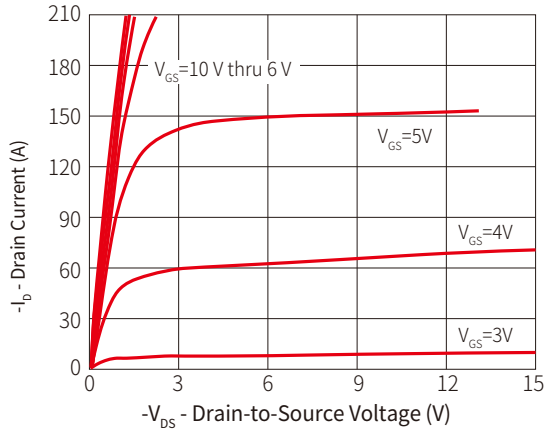
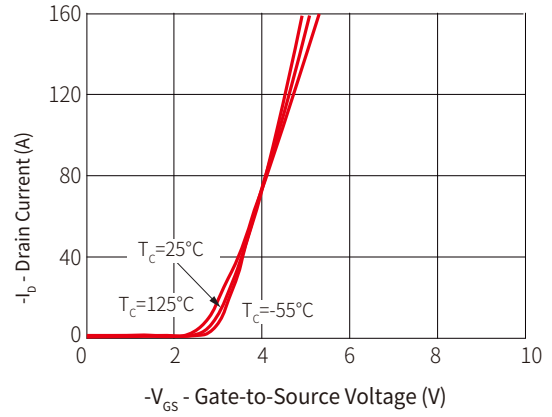
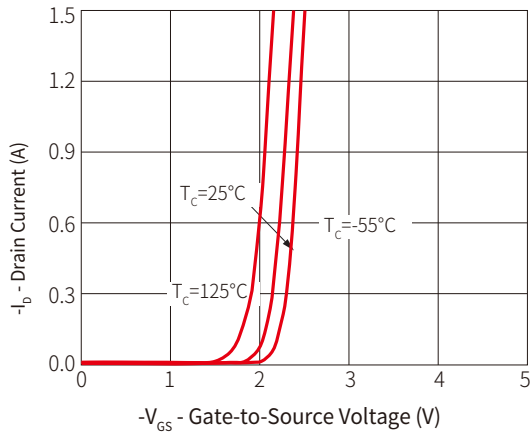
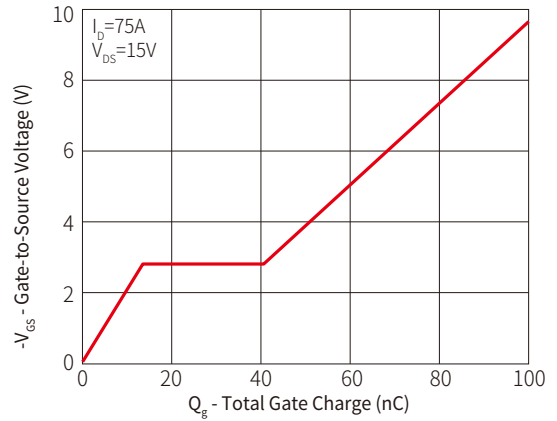
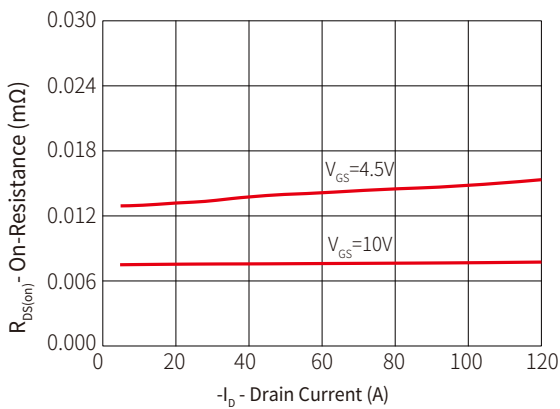
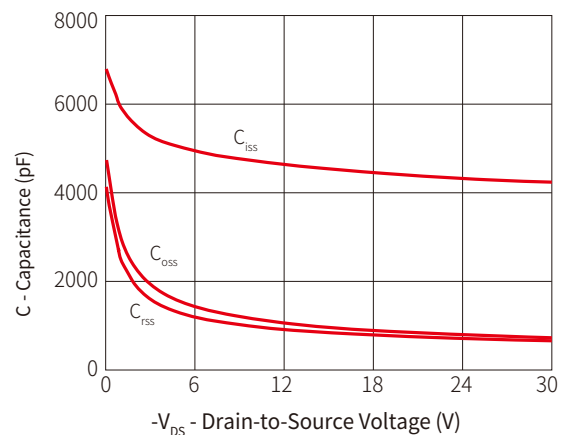
## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =-250μA	-1.1	-1.6	-2.2	V
Drain Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V			-1	μA
<b>On Characteristics</b>						
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
Static Drain-Source ON-Resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-15A		7.8	10.2	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A		13	17	mΩ
<b>Dynamic Characteristics</b>						
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-25V, f = 1MHz		4304	5380	pF
Output capacitance	C <sub>oss</sub>			764	955	pF
Reverse transfer capacitance	C <sub>rss</sub>			680	850	pF
Total Gate Charge <sup>b</sup>	Q <sub>g</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =-10 I <sub>D</sub> =75A		103.5	155	nC
Gate-Source Charge <sup>b</sup>	Q <sub>gs</sub>			14.3		nC
Gate Drain ("Miller") Charge <sup>b</sup>	Q <sub>gd</sub>			26.9		nC
Gate Resistance <sup>b</sup>	R <sub>g</sub>	f = 1 MHz	1.42	2.85	4.28	Ω
<b>Switching Characteristics</b>						
Turn-on Delay Time <sup>b</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> =-15V, R <sub>L</sub> =0.2Ω I <sub>D</sub> =-75A, V <sub>GEN</sub> =-10V R <sub>g</sub> =1Ω		11	17	nS
Turn-on Rise Time <sup>b</sup>	t <sub>r</sub>			10	15	nS
Turn-Off Delay Time <sup>b</sup>	t <sub>d(off)</sub>			63	95	nS
Turn-Off Fall Time <sup>b</sup>	t <sub>f</sub>			26	39	nS
<b>Drain-Source Diode Characteristics and Max Ratings</b>						
Drain to Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>F</sub> =-36A, V <sub>GS</sub> =0V		-0.9	-1.5	V

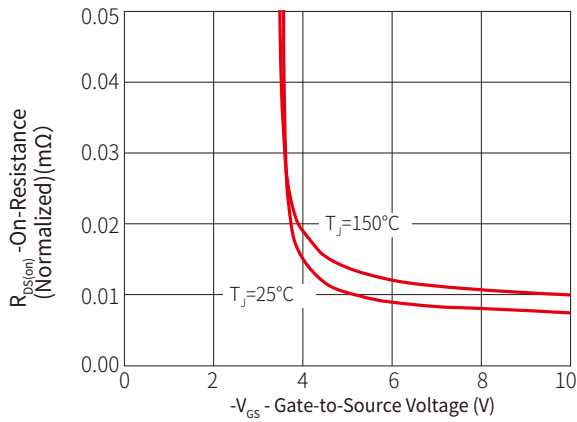
**Notes**

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.  
b. Guaranteed by design, not subject to production testing.

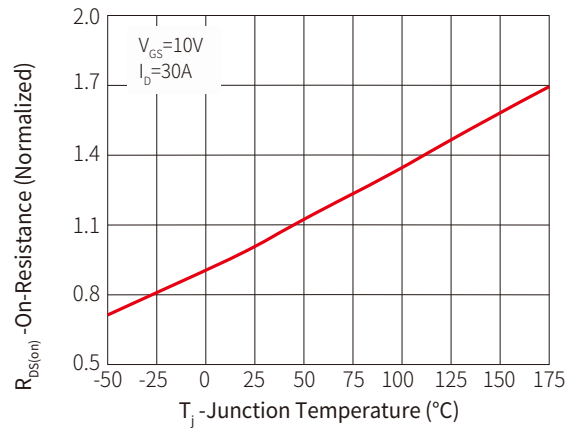
# PARAMETER CHARACTERISTIC CURVE

**Fig 1: Output Characteristics**

**Figure 2: Typical Transfer Characteristics**

**Figure 3: Transfer Characteristics**

**Figure 4: Gate Charge**

**Figure 5: On-Resistance vs. Drain Current**

**Figure 6: Capacitance**


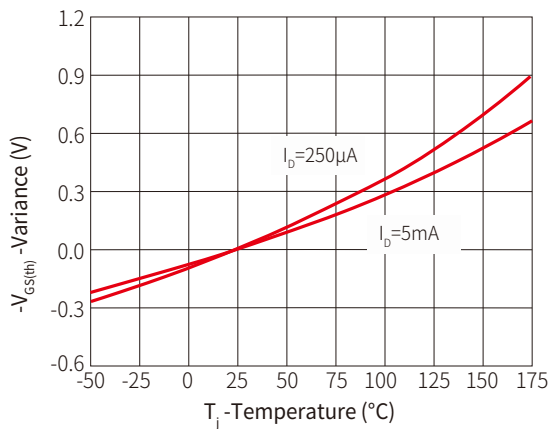
**Figure 7: On-Resistance vs. Gate-to-Source Voltage**



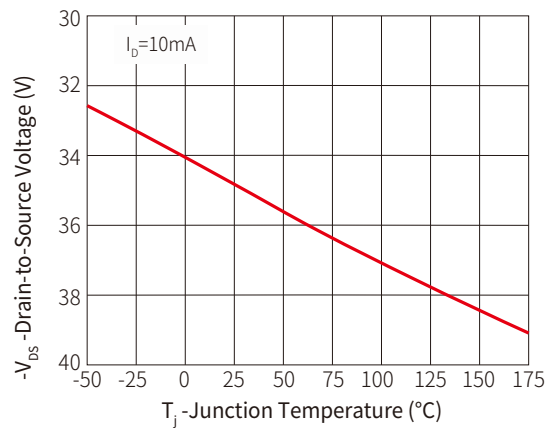
**Figure 8: On-Resistance vs. Junction Temperature**



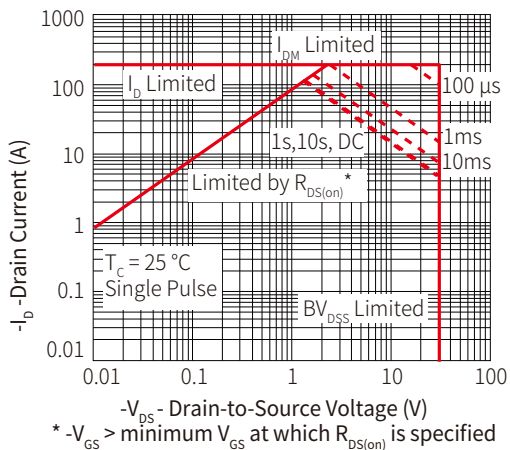
**Figure 9: Threshold Voltage**

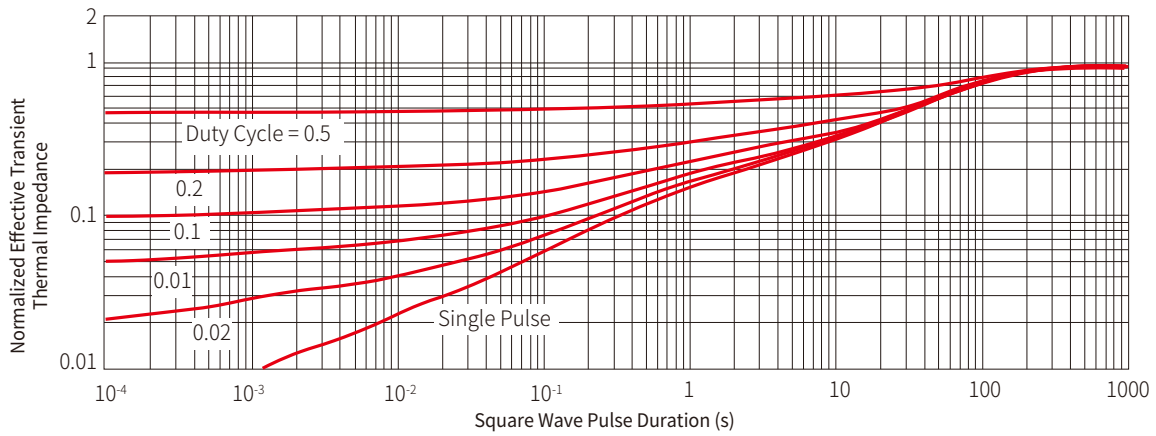


**Figure 10: Drain Source Breakdown vs. Junction Temperature**

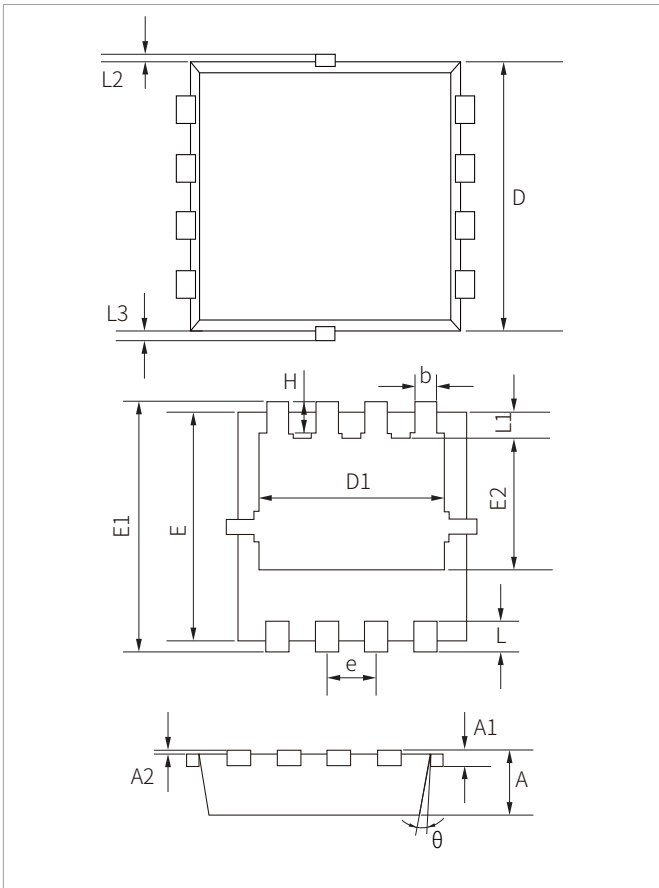


**Figure 11: Safe Operating Area**




**Figure 12: Normalized Thermal Transient Impedance, Junction-to-Ambient**


## 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	3.300	0.114	0.130
D1	2.250	2.650	0.089	0.104
E	2.900	3.300	0.114	0.130
E1	3.150	3.550	0.124	0.140
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
$\theta$	9°	13°	9°	13°

## ORDERING INFORMATION

Part Number	Component Package	Marking	QTY/Reel	Reel Size
SPM40P03Q	PDFN3.3×3.3-8L	 40P03 XXXX	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](mailto:sales18@semiware.com)

**Customer Service**

Tel: 86-21-5484-1001  
Email: [sales17@semiware.com](mailto:sales17@semiware.com)

**Technical Support**

Tel: 86-21-3463-7654  
Email: [fae01@semiware.com](mailto:fae01@semiware.com)

**Complaint & Suggestions**

Tel: 86-21-3463-7172  
Ext: 8868  
Email: [cs03@semiware.com](mailto:cs03@semiware.com)

**By QR Code**

Website



Wechat

To find your local partner within Semiware' s global website: [www.semiware.com](http://www.semiware.com)

© 2022 Semiware Semiconductor Inc.

The content of this document has been carefully checked and understood. However, neither Semiware nor its subsidiaries assume any liability whatsoever for any errors or inaccuracies of this document and the consequences thereof. Published specifications are subject to change without notice. Product suitability for any area of application must ultimately be determined by the customer. In all cases, products must never be operated outside their published specifications. Semiware does not guarantee the availability of all published products. This disclaimer shall be governed by substantive Chinese law and resulting disputes shall be settled by the courts at the place of business of Semiware. Latest publications and a complete disclaimer can be downloaded from the Semiware website. All trademarks recognized.