

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
40V	1.0mΩ@10V	250A
	1.6mΩ@4.5V	

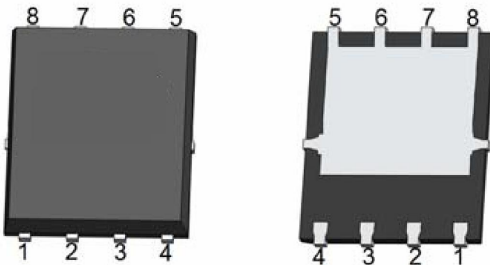
### Feature

- Fast switching speed
- Reliable and rugged
- Lead-free parts meet RoHS requirements
- Epoxy:UL94-V0 rated flame retardant

### Application

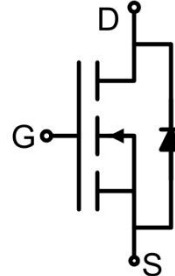
- DC-to-DC converters
- Switch mode power supply
- Brushless DC motor control

### Package

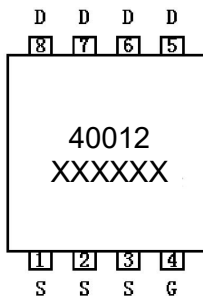


PDFN5\*6-8L

### Circuit diagram



### Marking



### Absolute maximum ratings (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current(T <sub>C</sub> =25°C)	I <sub>D</sub>	250	A
Continuous Drain Current(T <sub>C</sub> =100°C)	I <sub>D</sub> (100°C)	162	A
Pulsed Drain Current <sup>1)</sup> (T <sub>C</sub> =25°C)	I <sub>DM</sub>	400	A
Power Dissipation(T <sub>C</sub> =25°C)	P <sub>D</sub>	89	W
Thermal Resistance,Junction-to-Case	R <sub>θJC</sub>	1.3	°C/W
Thermal resistance junction to ambient <sup>3)</sup>	R <sub>θJA</sub>	60	°C/W
Single pulse avalanche energy current <sup>2)</sup> (L =0.5mH)	I <sub>AS</sub>	34	A
Single pulse avalanche energy <sup>2)</sup> (L =0.5mH)	E <sub>AS</sub>	290	mJ
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 ~ +150	°C

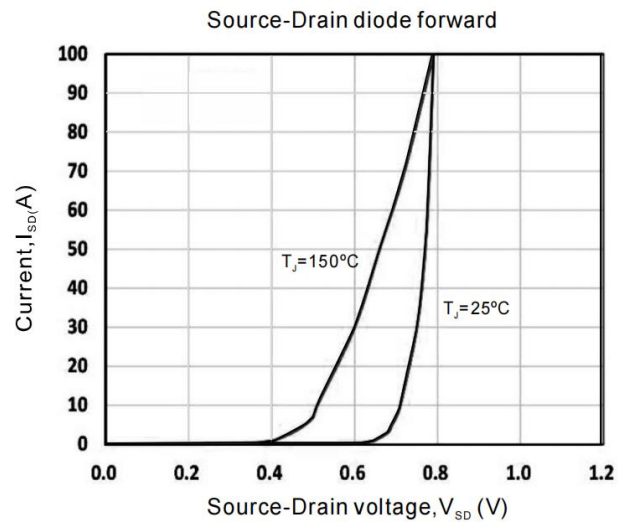
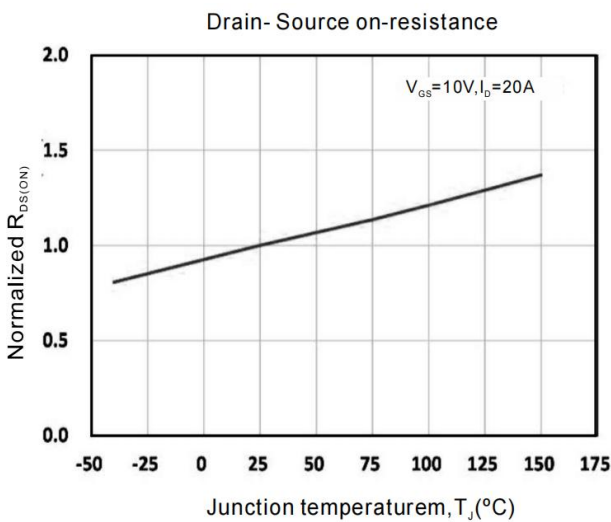
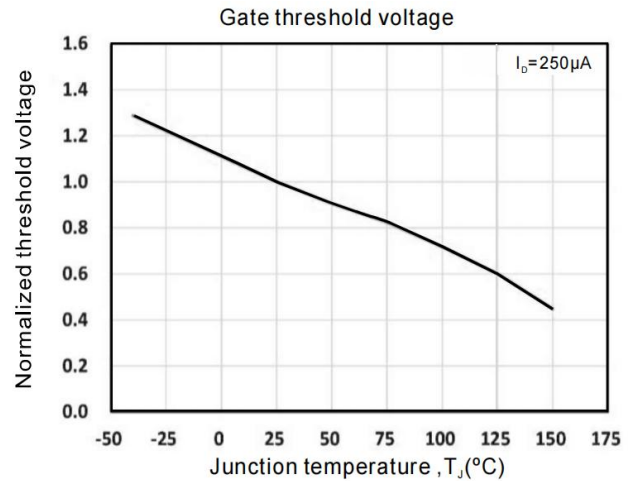
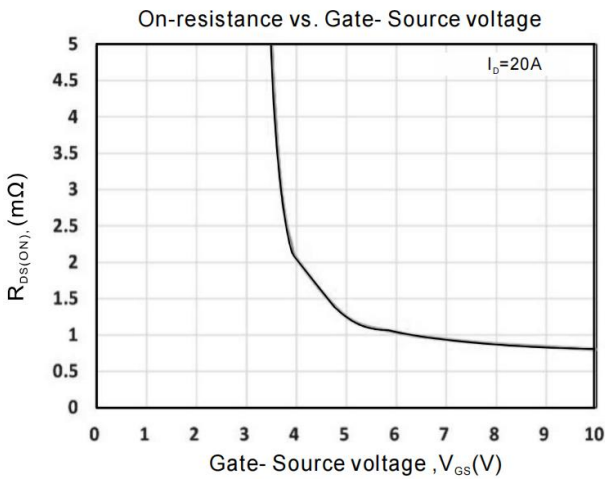
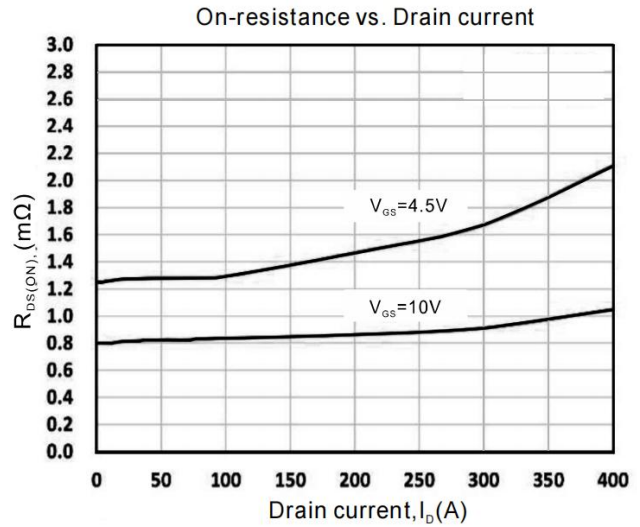
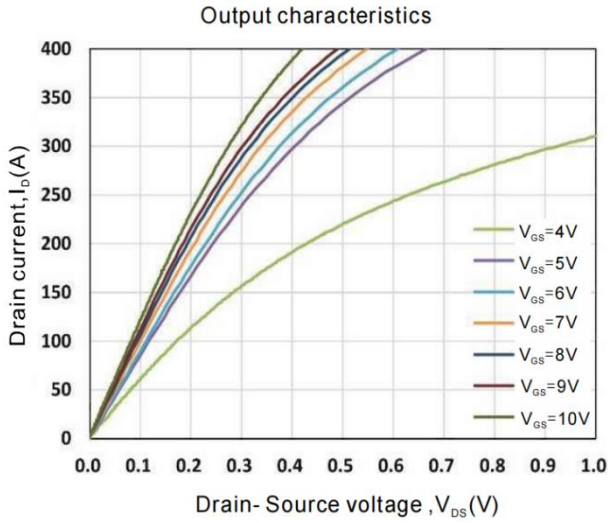
### Electrical characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	40			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =32V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.7	2.3	V
Drain-source on-resistance <sup>4)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		0.8	1	mΩ
Drain-source on-resistance <sup>4)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A		1.25	1.6	mΩ
<b>Dynamic characteristics<sup>5)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f =1MHz		4928		pF
Output Capacitance	C <sub>oss</sub>			2000		
Reverse Transfer Capacitance	C <sub>rss</sub>			65		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A		69		nC
Gate-Source Charge	Q <sub>gs</sub>			16.5		
Gate-Drain Charge	Q <sub>gd</sub>			10		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A, R <sub>G</sub> =3Ω		10.7		nS
Turn-on rise time	t <sub>r</sub>			25.3		
Turn-off delay time	t <sub>d(off)</sub>			65.2		
Turn-off fall time	t <sub>f</sub>			53.6		
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>4)</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =10A			1.1	V
Diode reverse recovery time	t <sub>rr</sub>	V <sub>R</sub> =20V, I <sub>F</sub> =20A,		48.6		nS
Diode reverse recovery charge	Q <sub>rr</sub>	d <sub>I</sub> F/dt =100A/μs		35.5		nC

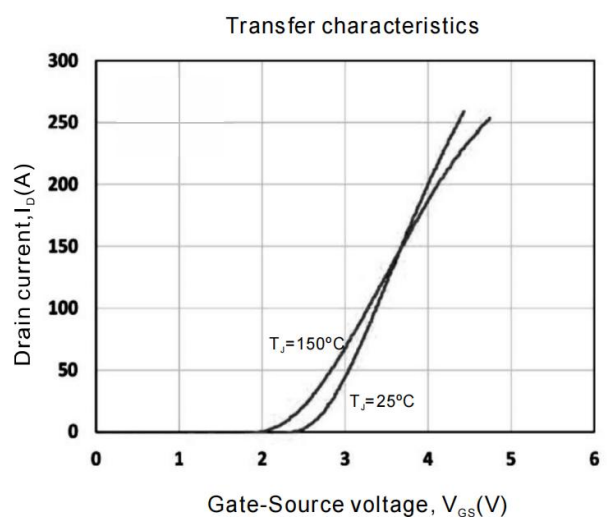
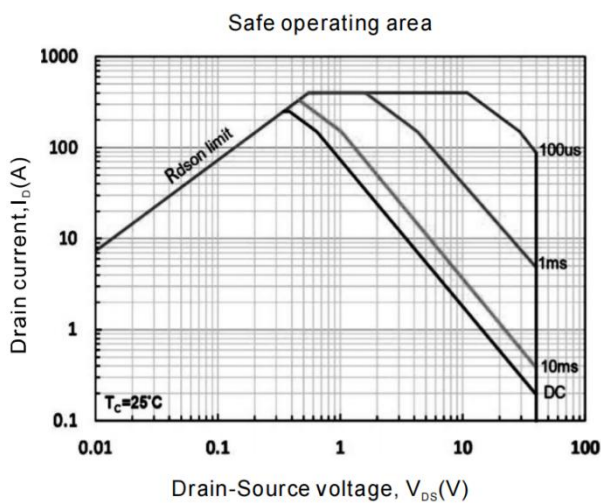
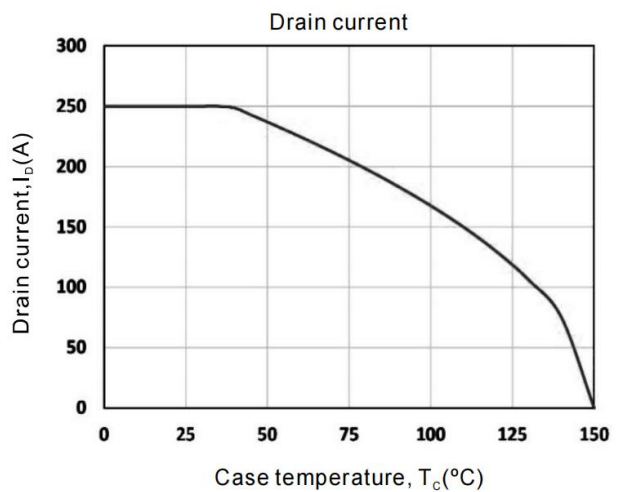
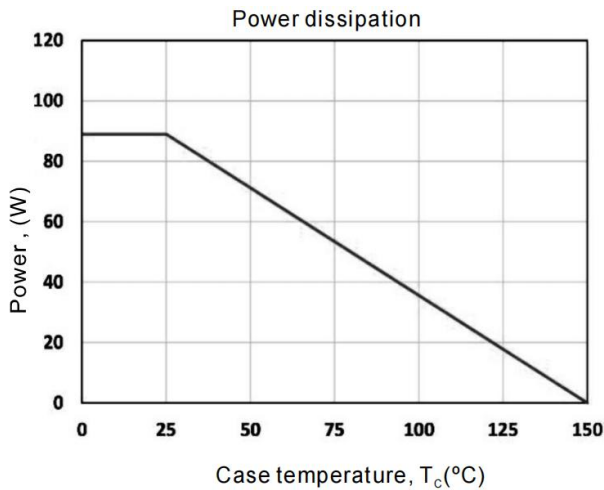
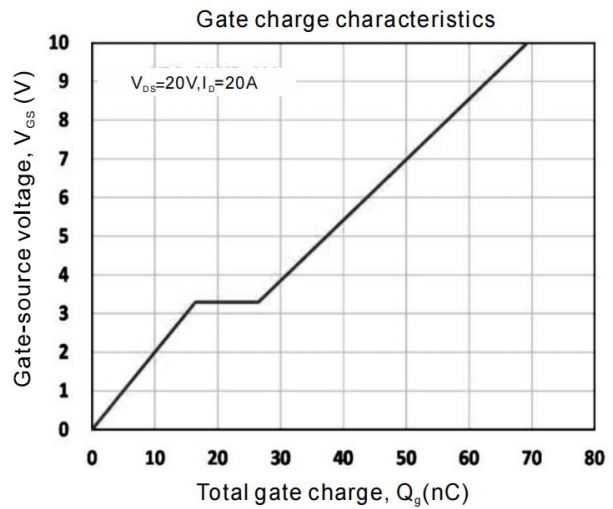
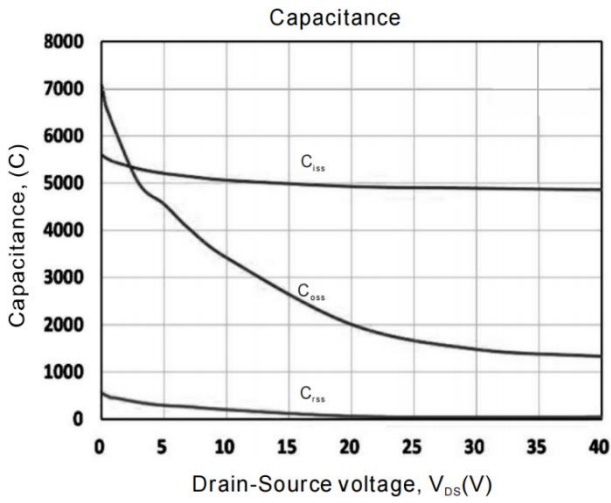
Notes:

- 1) Max.current is limited by bonding.
- 2) UIS tested and pulse width are limited by maximum junction temperature 150°C.
- 3) Surface mounted on 1in2 FR-4 board with 1oz.
- 4) Pulse tere (pulse width ≤300μA, duty cycle ≤2% )
- 5) Guaranteed by design, not subject to production.

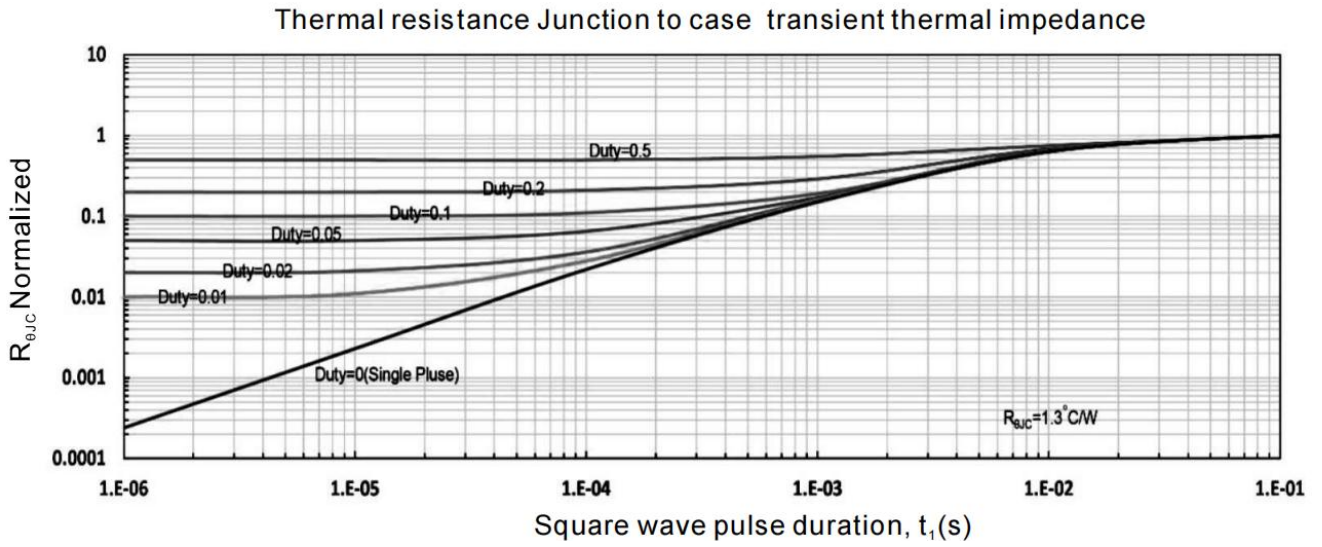
## Typical Characteristics



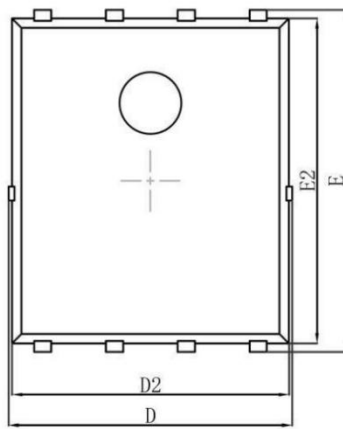
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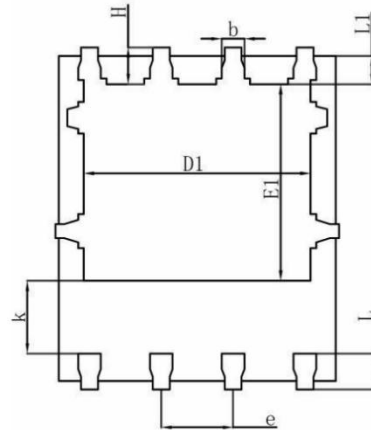
**Typical Characteristics**



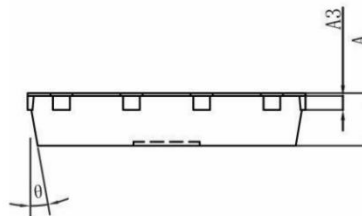
### PDFN5\*6-8L Package Information



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	1.100	0.031	0.043
A3	0.254 REF.		0.010 REF.	
D	4.800	5.100	0.189	0.201
E	5.950	6.200	0.234	0.244
D1	3.610	4.110	0.142	0.162
E1	3.375	3.780	0.133	0.149
D2	4.824	4.976	0.190	0.196
E2	5.670	5.900	0.223	0.232
k	1.190	1.450	0.047	0.057
b	0.350	0.510	0.014	0.020
e	1.270 BSC.		0.050 BSC.	
L	0.510	0.711	0.000	0.000
L1	0.424	0.576	0.020	0.028
H	0.574	0.726	0.017	0.023
$\theta$	10°	12°	10°	12°