

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
60V	2.6mΩ@10V	100A
	3.5mΩ@4.5V	

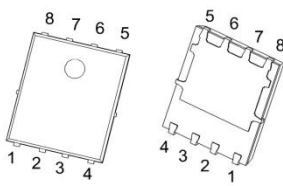
### Feature

- Low  $R_{DS(on)}$  & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery

### Applications

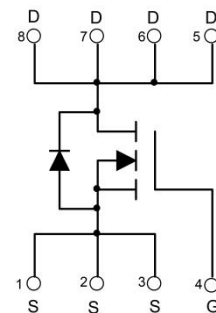
- Consumer electronic power supply
- Motor control
- Synchronous-rectification
- Isolated DC/DC convertor
- Invertors

### Package



PDFN5×6-8L

### Circuit diagram



### Marking



60N03G : Product code  
\* :Month code.



## Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain source voltage	$V_{DS}$	60	V
Gate source voltage	$V_{GS}$	±20	V
Continuous drain current <sup>1)</sup>	$I_D$	100	A
Pulsed drain current <sup>2)</sup>	$I_{DM}$	400	A
Power dissipation <sup>3)</sup>	$P_D$	140	W
Single pulsed avalanche energy <sup>5)</sup>	$E_{AS}$	80	mJ
Thermal resistance, junction-case	$R_{\theta JC}$	0.89	°C/W
Thermal resistance, junction-ambient <sup>4)</sup>	$R_{\theta JA}$	62	°C/W
Operation and storage temperature	$T_{stg}, T_j$	-55 to 150	°C

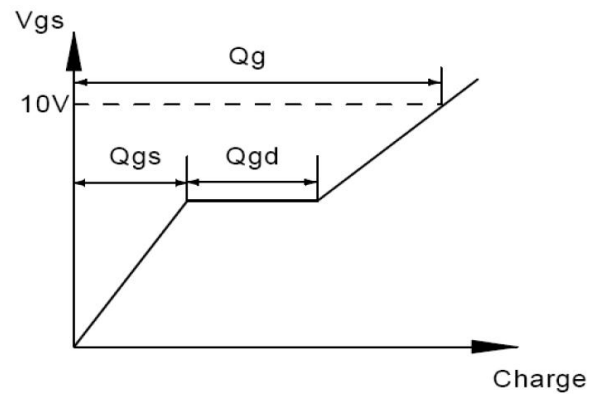
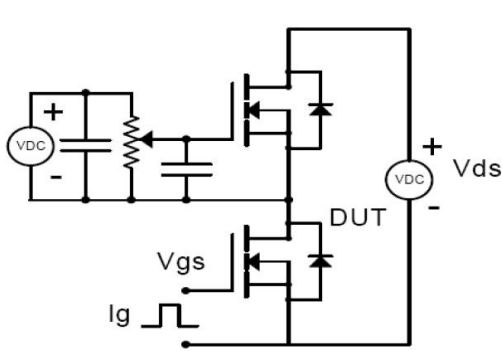
## Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$BV_{DSS}$	$V_{GS}=0\text{ V}, I_D=250\ \mu\text{A}$	60			V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\ \mu\text{A}$	1.3		2.5	V
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=10\text{ V}, I_D=20\text{ A}$		2.6	3.2	mΩ
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=4.5\text{ V}, I_D=10\text{ A}$		3.5	4.3	mΩ
Gate-source leakage current	$I_{GSS}$	$V_{GS}=\pm 20\text{ V}$			±100	nA
Drain-source leakage current	$I_{DSS}$	$V_{DS}=60\text{ V}, V_{GS}=0\text{ V}$			1	μA
<b>Dynamic Characteristics</b>						
Input capacitance	$C_{iss}$	$V_{GS}=0\text{ V}, V_{DS}=25\text{ V}, f=100\text{ kHz}$		4250		pF
Output capacitance	$C_{oss}$			975		pF
Reverse transfer capacitance	$C_{rss}$			41		pF
Turn-on delay time	$t_{d(on)}$	$V_{DD}=30\text{ V}, V_{GS}=10\text{ V}, R_G=4.7\ \Omega, I_D=20\text{ A}$		13.5		ns
Rise time	$t_r$			96		ns
Turn-off delay time	$t_{d(off)}$			40		ns
Fall time	$t_f$			115		ns
<b>Switching Characteristics</b>						
Total gate charge	$Q_g$	$V_{DS}=30\text{ V}, V_{GS}=10\text{ V}, I_D=20\text{ A}$		42		nC
Gate-source charge	$Q_{gs}$			12		nC
Gate-drain charge	$Q_{gd}$			10		nC
<b>Drain-Source Body Diode Characteristics</b>						
Diode forward voltage	$V_{SD}$	$I_S=20\text{ A}, V_{GS}=0\text{ V}$			1.3	V

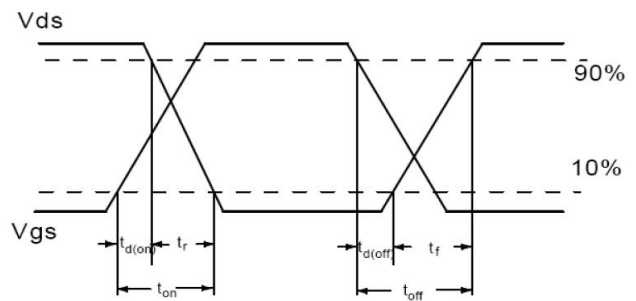
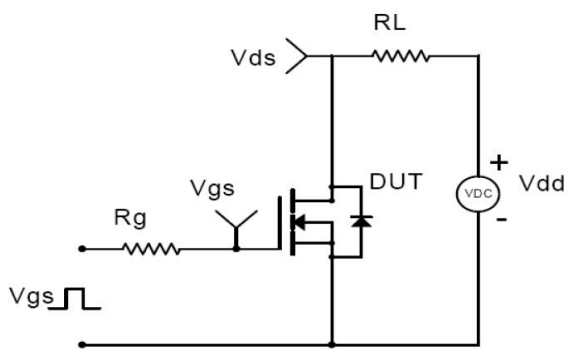
## Note:

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3.  $P_d$  is based on max. junction temperature, using junction-case thermal resistance.
4. The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_a=25\text{ }^\circ\text{C}$ .
5.  $V_{DD}=50\text{ V}, R_G=25\ \Omega, L=0.3\text{ mH}$ , starting  $T_j=25\text{ }^\circ\text{C}$ .

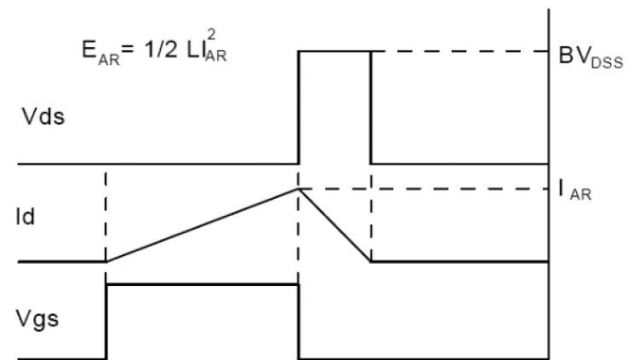
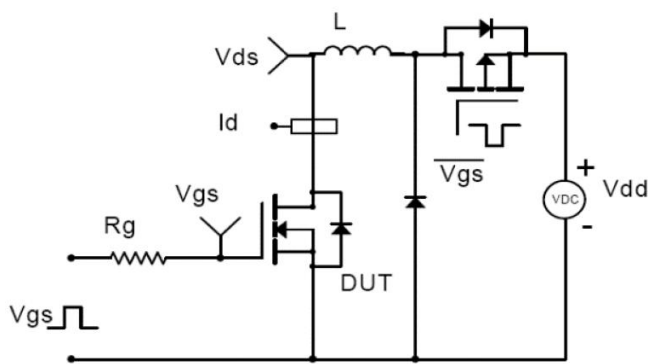
**Test circuit**



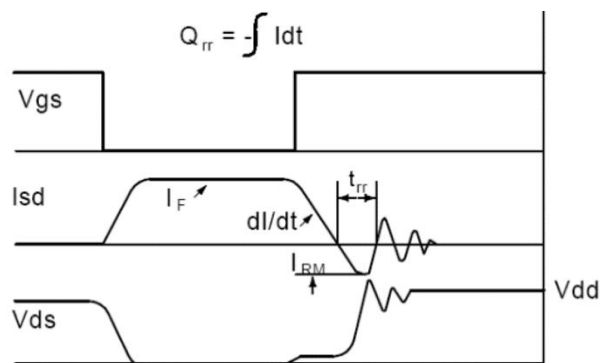
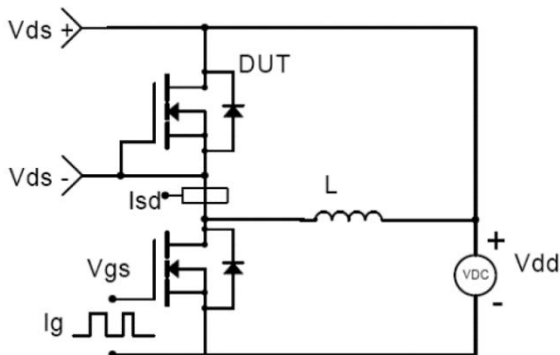
**Gate charge test circuit & waveform**



**Switching time test circuit & waveforms**

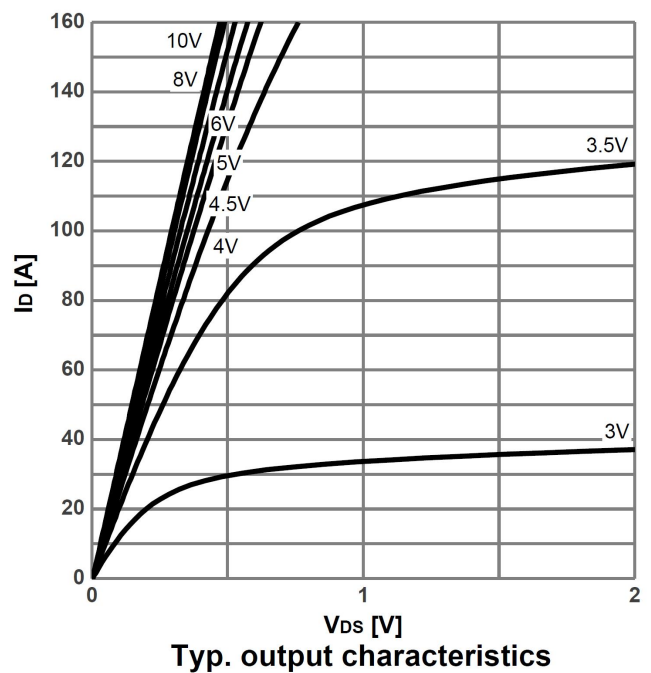
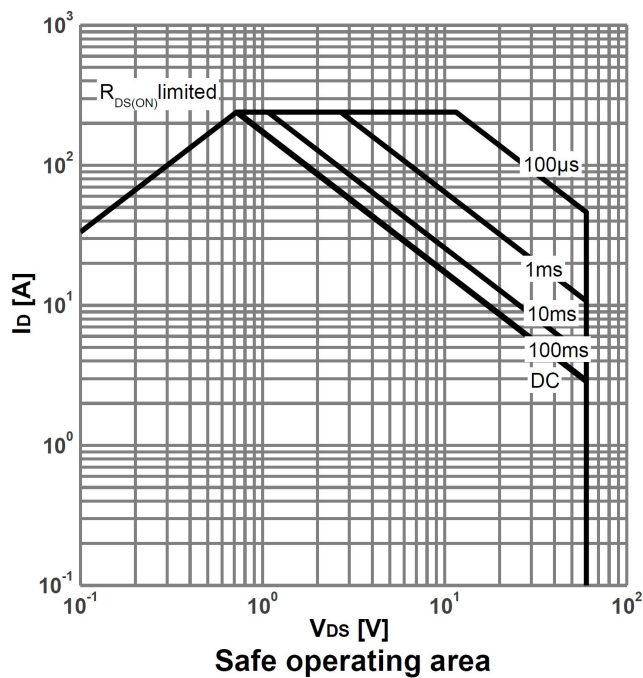
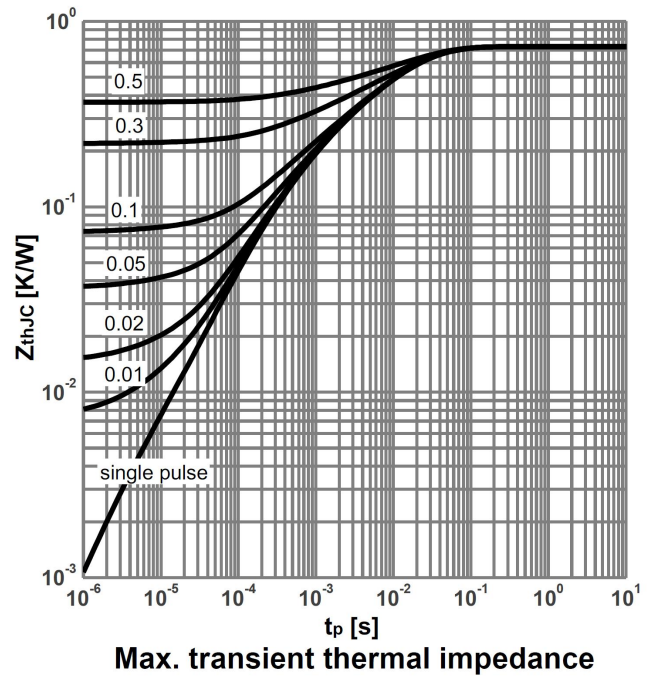
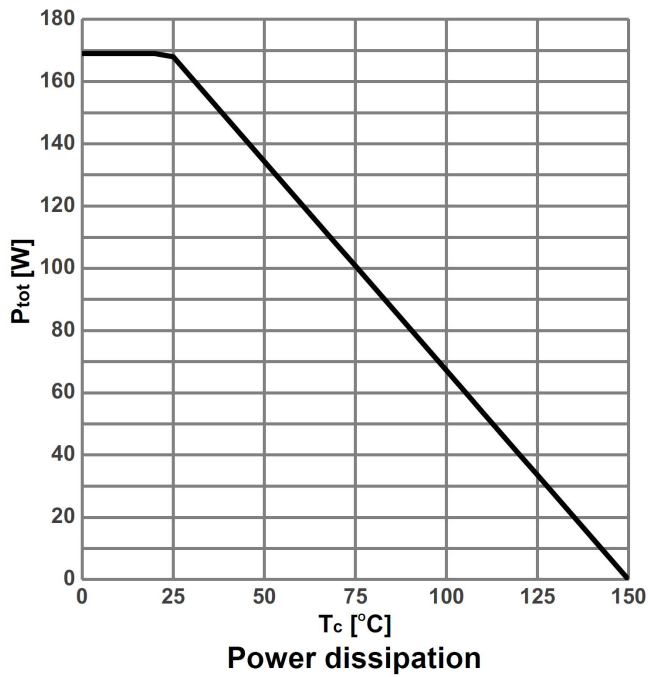


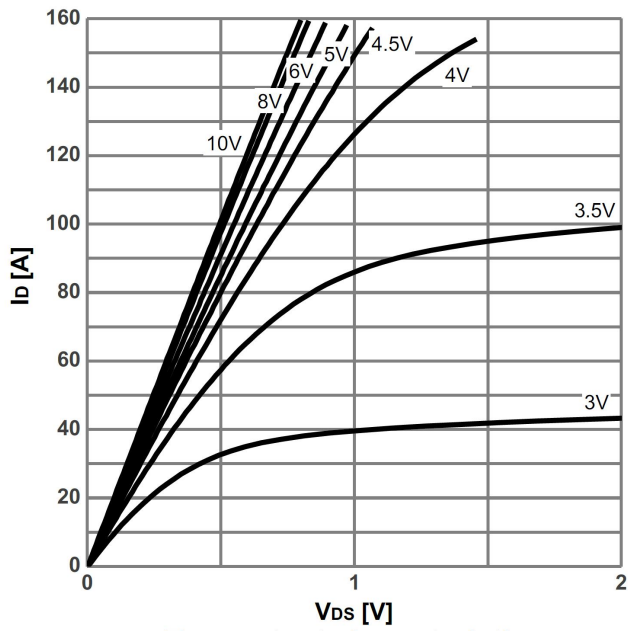
**Unclamped inductive switching (UIS) test circuit & waveforms**



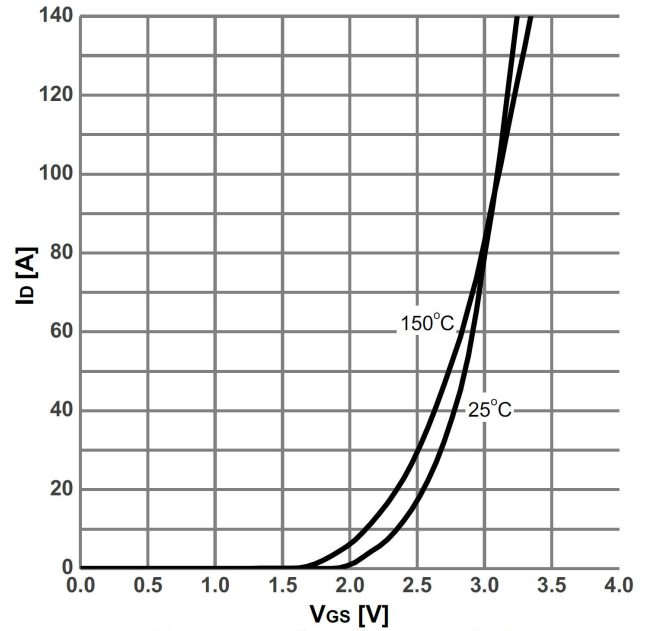
**Diode reverse recovery test circuit & waveforms**

**Typical Characteristics**

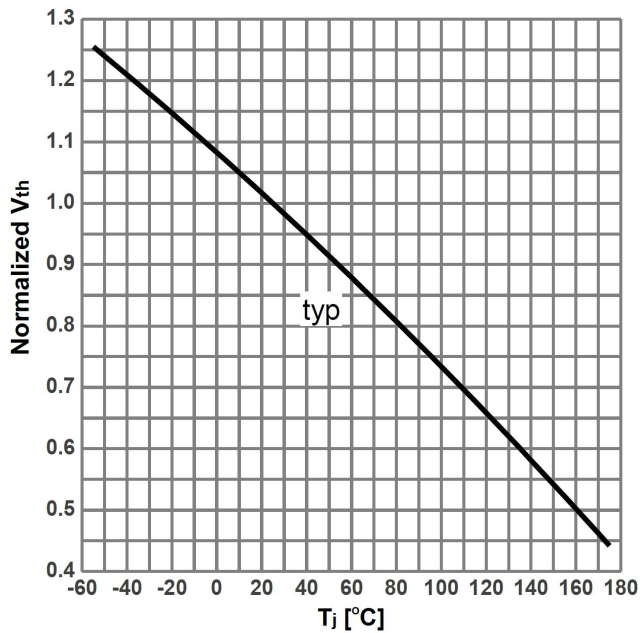




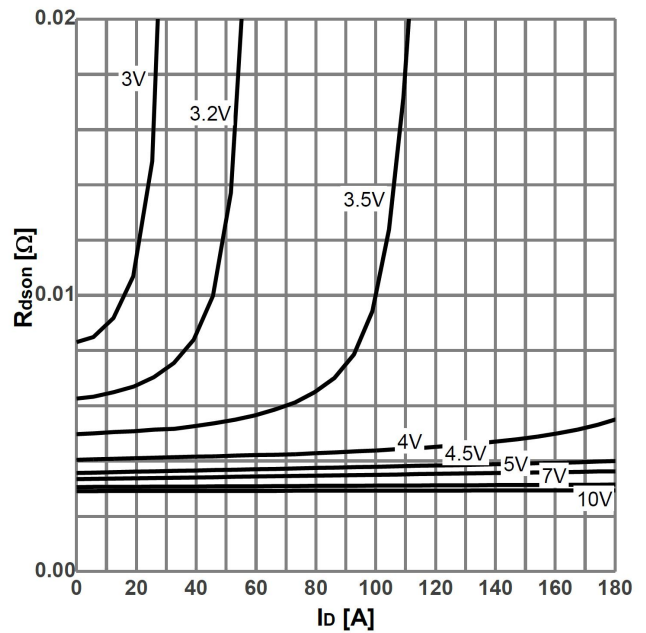
Typ. output characteristics



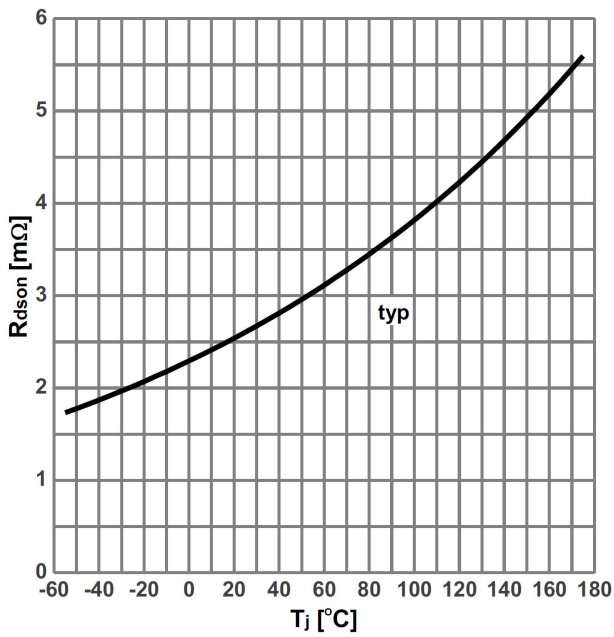
Typ. transfer characteristics



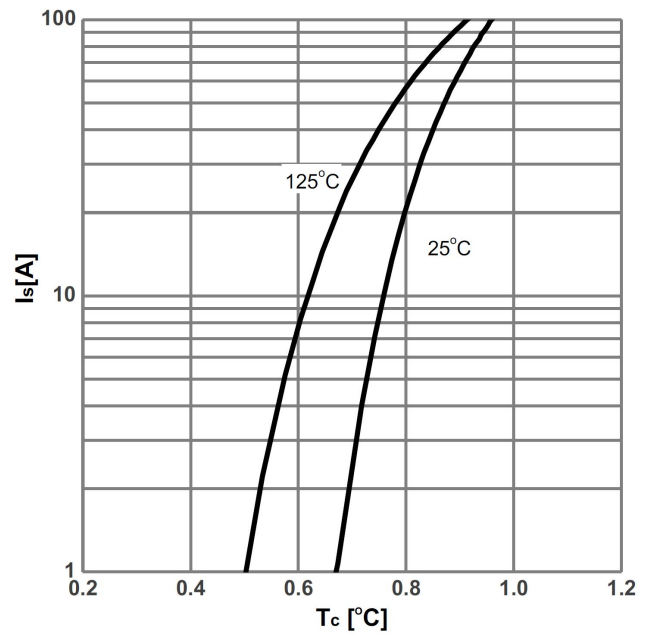
Gate threshold voltage vs. Junction temperature



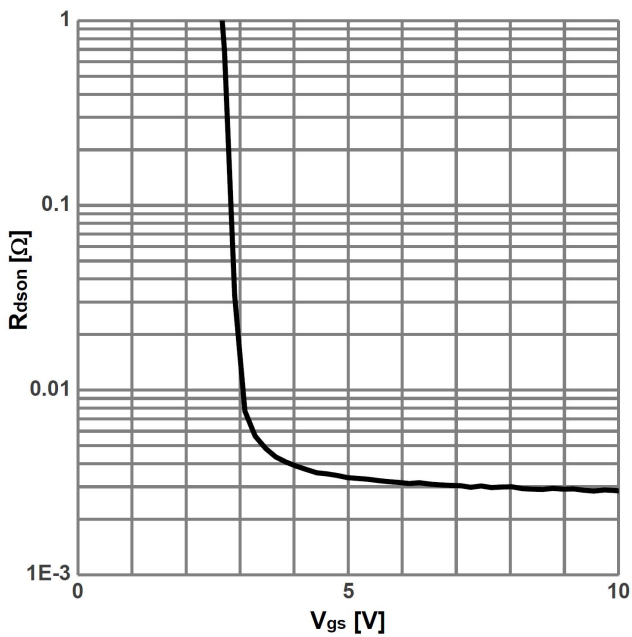
On-state resistance vs. Drain current



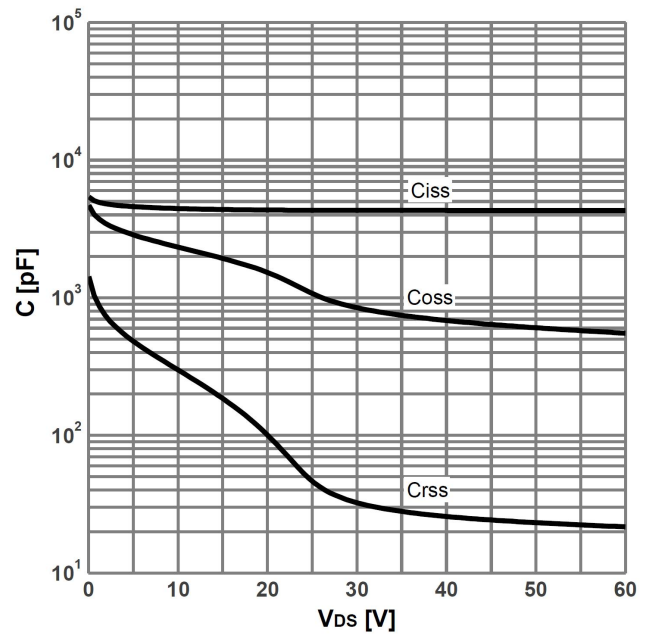
On-state resistance vs. Junction temperature



Forward characteristics of reverse diode



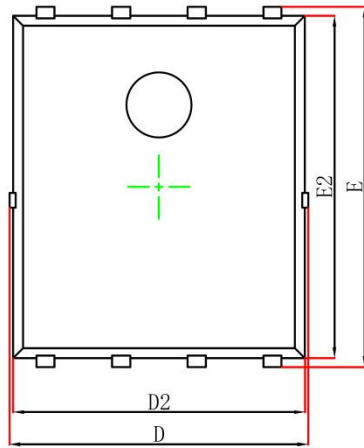
On-state resistance vs. Vgs characteristics



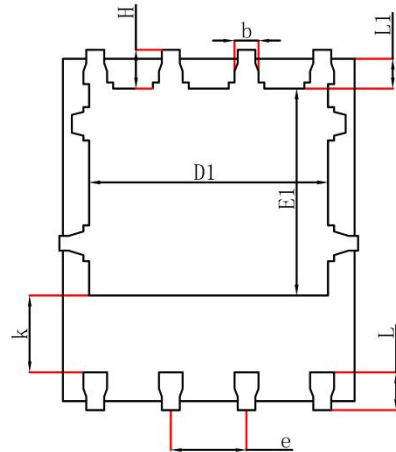
Typ. capacitances



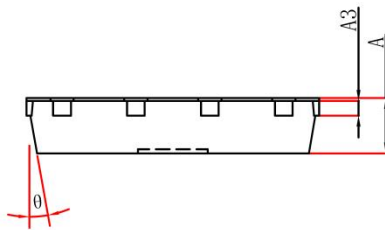
PDFN5X6-8L Package Information



Top View  
[顶视图]



Bottom View  
[背视图]



Side View  
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

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