

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	2.3mΩ@10V	120A
	2.7mΩ@4.5V	

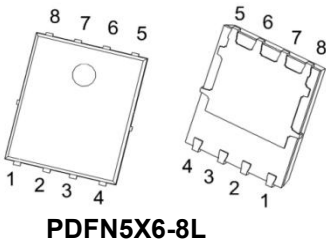
Feature

- Trench Power Technology
- Low RDS(ON)
- Low Gate Charge
- Optimized for Fast-switching Applications

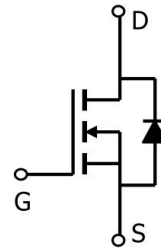
Application

- High Speed Power Switching
- DC/DC Converters

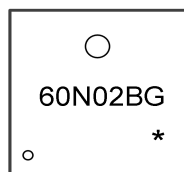
Package



Circuit diagram



Marking



60N02BG : 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 ($T_C=25^\circ\text{C}$, Silicon limited)	I_D	240	A
Continuous Drain Current ($T_C=25^\circ\text{C}$, Package limited)	I_D	120	A
Pulsed Drain Current	I_{DM}	480	A
Single Pulse Avalanche Energy (note1)	E_{AS}	243	mJ
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	125	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1	$^\circ\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ\text{C}$

Electrical characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)

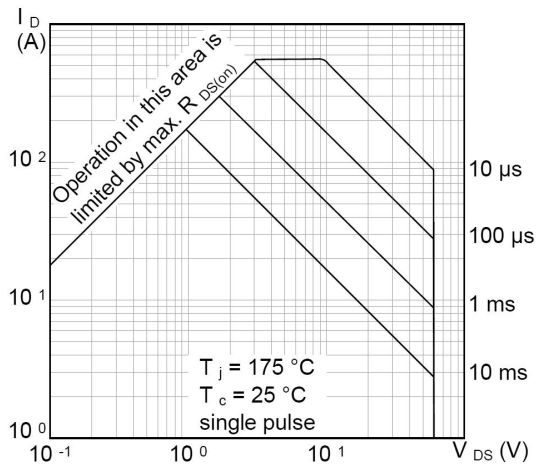
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48V, V_{GS} = 0V$	--	--	1	μA
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 20V$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.2	1.7	2.2	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 40A$	--	2.3	2.9	m Ω
		$V_{GS} = 4.5V, I_D = 40A$	--	2.7	4.3	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 30V, f = 1.0\text{MHz}$	--	3910	--	pF
Output Capacitance	C_{oss}		--	1300	--	
Reverse Transfer Capacitance	C_{rss}		--	11	--	
Total Gate Charge	Q_g	$V_{DD} = 30V, I_D = 40A, V_{GS} = 10V$	--	53	--	nC
Gate-Source Charge	Q_{gs}		--	17	--	
Gate-Drain Charge	Q_{gd}		--	10	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 30V, V_{GS} = 10V, I_D = 40A, R_G = 4\Omega$	--	15	--	ns
Turn-on Rise Time	t_r		--	34	--	
Turn-off Delay Time	$t_{d(off)}$		--	33	--	
Turn-off Fall Time	t_f		--	9	--	
Drain-Source Body Diode Characteristics						
Body Diode Voltage	V_{SD}	$V_{GS} = 0V, I_S = 40A,$	--	--	1.2	V
Reverse Recovery Time	t_{rr}	$I_F = 40A,$	--	48	--	ns
Reverse Recovery Charge	Q_{rr}	$diF/dt = 100A/\mu\text{s}$	--	99	--	nC

Notes :

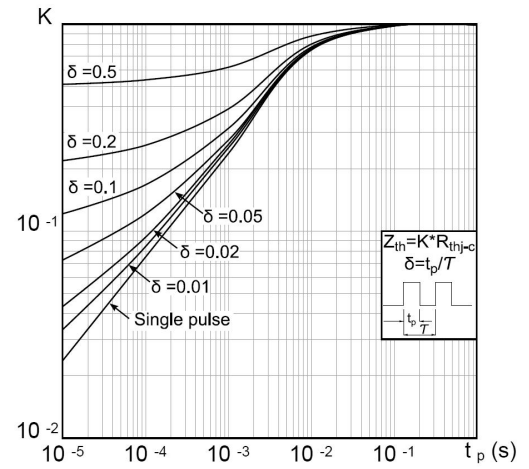
1. EAS condition: $V_{DD} = 30V, V_G=10V, L=0.3\text{mH}, R_g=25\Omega, T_J = 25^\circ\text{C}$.

Typical Characteristics

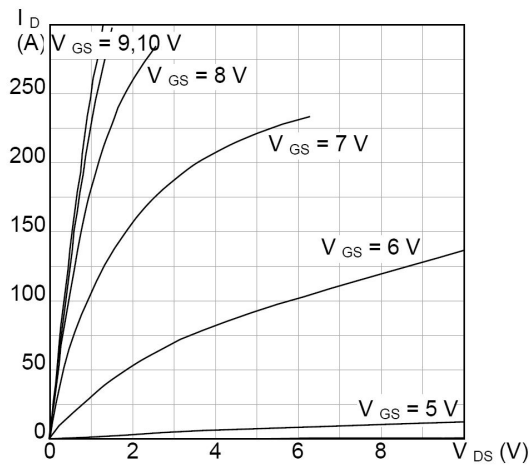
Safe operating area



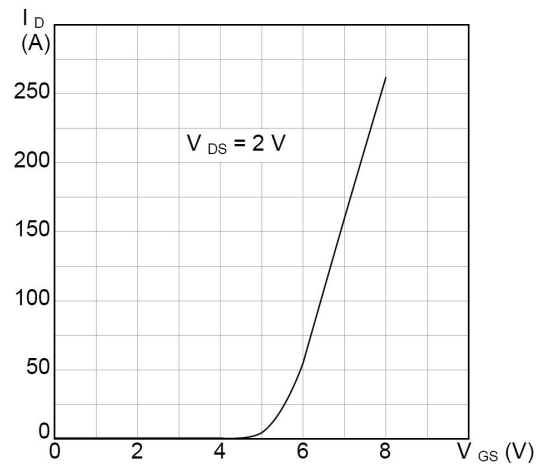
Thermal impedance



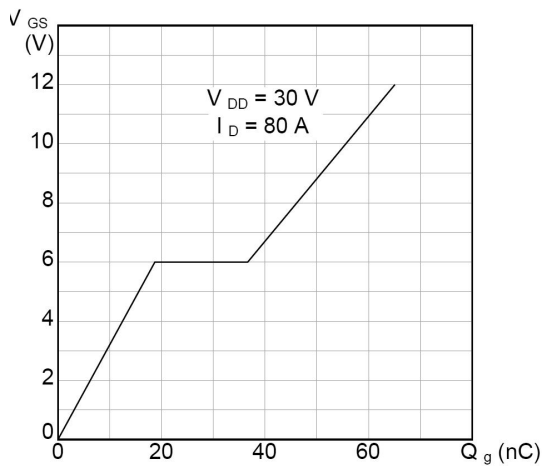
Output characteristics



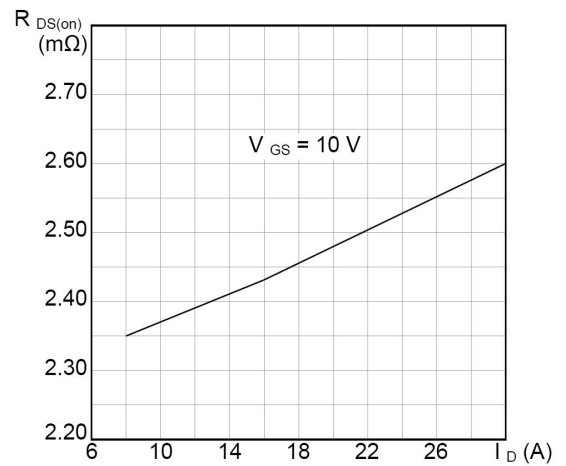
Transfer characteristics



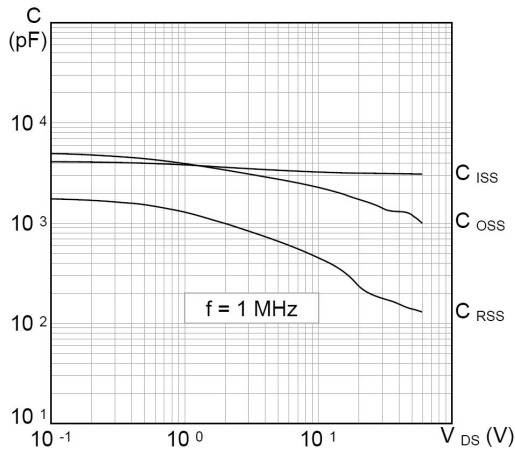
Gate charge vs gate-source voltage



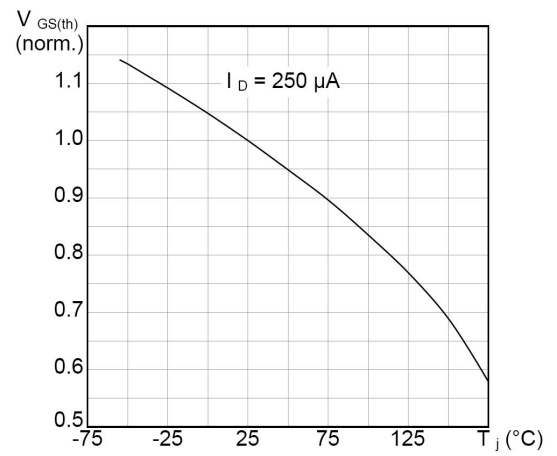
Static drain-source on-resistance



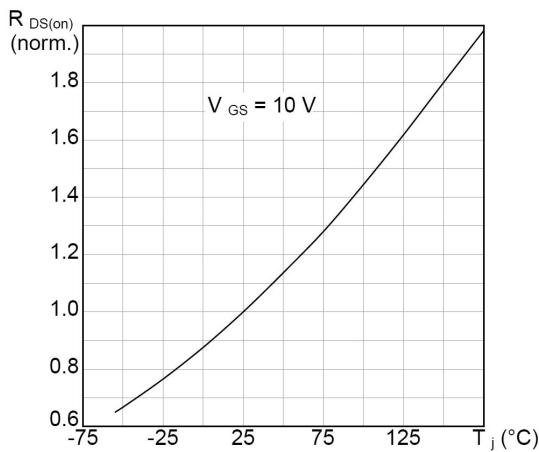
Capacitance variations



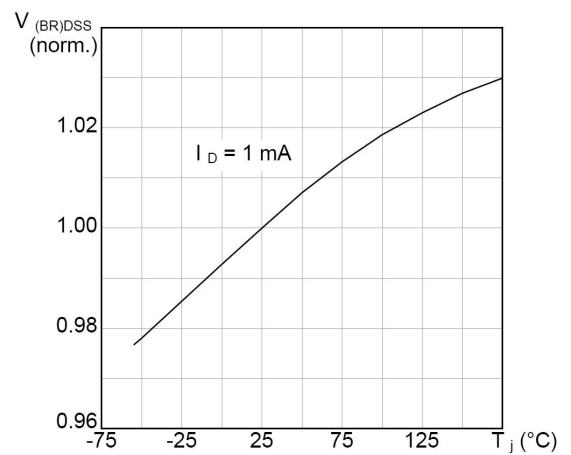
Normalized gate threshold voltage vs temperature



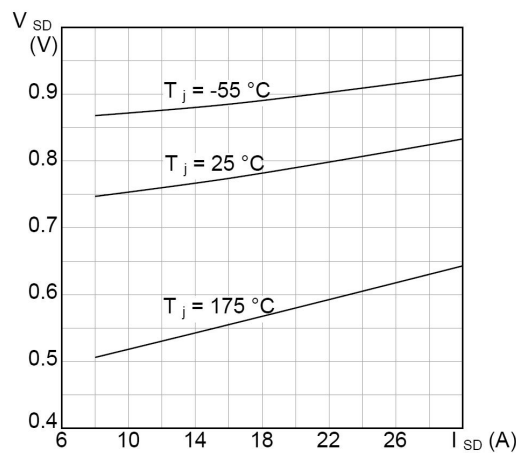
Normalized on-resistance vs temperature



Normalized $V_{(BR)DSS}$ vs temperature

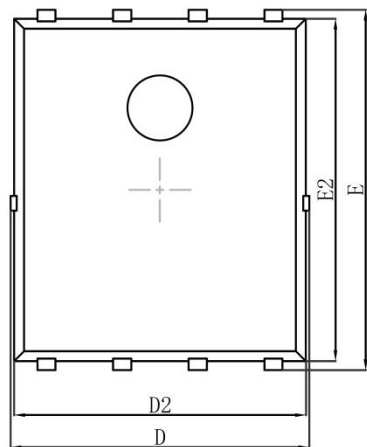


Source-drain diode forward characteristics

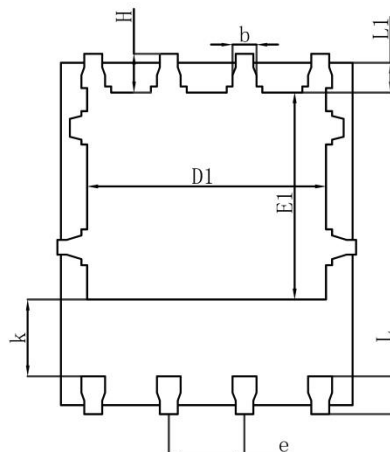




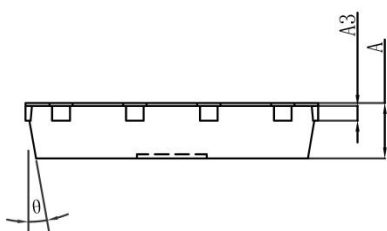
PDFN5X6-8L Package Outline Dimensions



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°