

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	2.5mΩ@10V	180A
	2.9mΩ@4.5V	

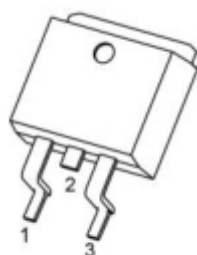
Feature

- Trench Power Technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Optimized for Fast-switching Applications

Applications

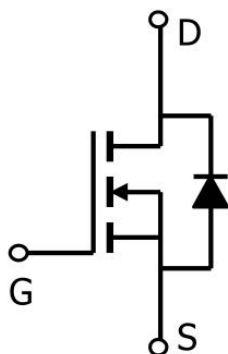
- High Speed Power Switching
- DC/DC Converters

Package



TO-263 (G:1 D:2 S:3)

Circuit diagram



Marking



60N02BG : Product code
 ** : Week code.

Absolute maximum ratings

($T_a=25^{\circ}\text{C}$ 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	180	A
Pulsed Drain Current	I_{DM}	720	A
Single Pulse Avalanche Energy	E_{AS}	243	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	220	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.57	$^{\circ}\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~ +150	$^{\circ}\text{C}$

Electrical characteristics

(T_A=25°C, unless otherwise noted)

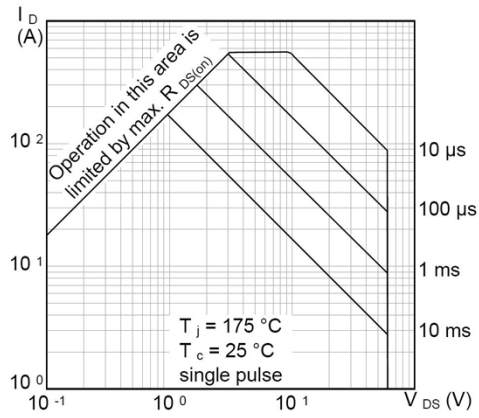
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V _{GS} = 0V, I _D =250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =48V,V _{GS} = 0V			1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V			±100	uA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.7	2.2	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =40A		2.5	3.2	mΩ
		V _{GS} =4.5V, I _D =40A		2.9	5.2	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHz		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		pF
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 =4Ω		15		nS
Turn-on Rise Time	T _r			34		
Turn-off Delay Time	T _{d(off)}			33		
Turn-off Fall Time	T _f			9		
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/μs		99		nC

Note :

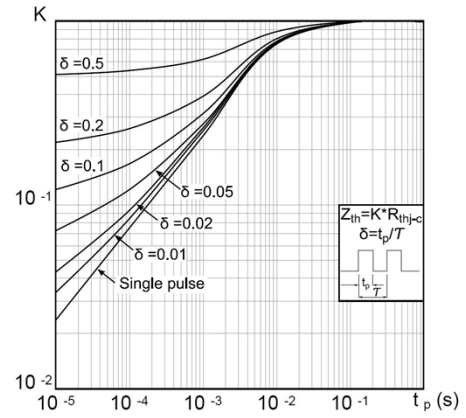
1. EAS condition: V_{DD} = 30V, V_G = 10V, L = 0.3mH, R_G = 25Ω, T_J = 25°C.

Typical Characteristics

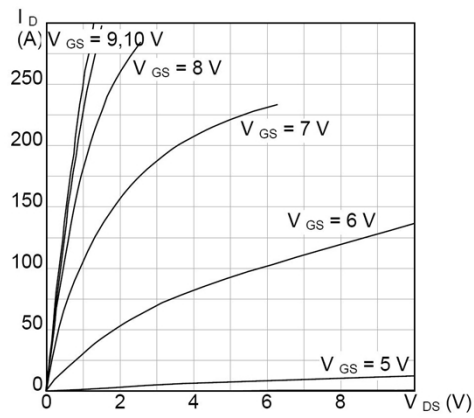
Safe operating area



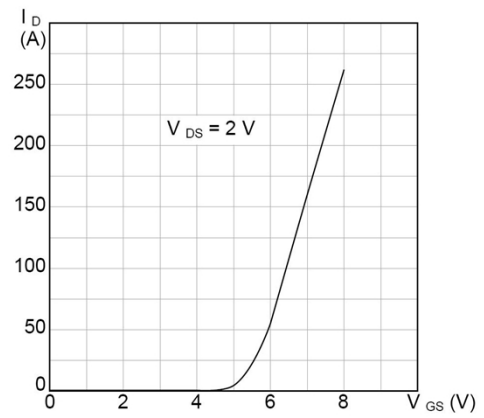
Thermal impedance



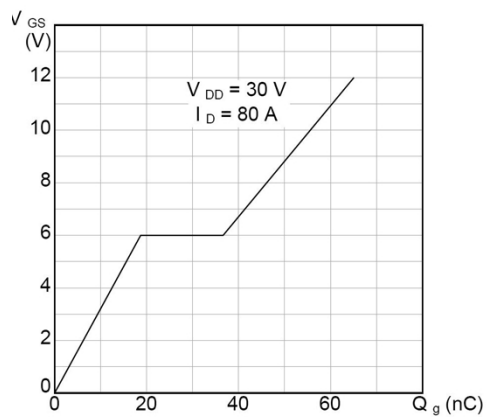
Output characteristics



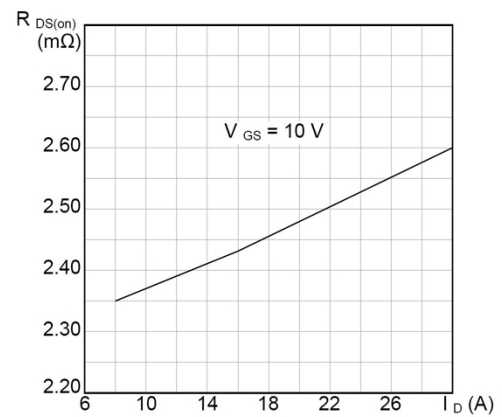
Transfer characteristics



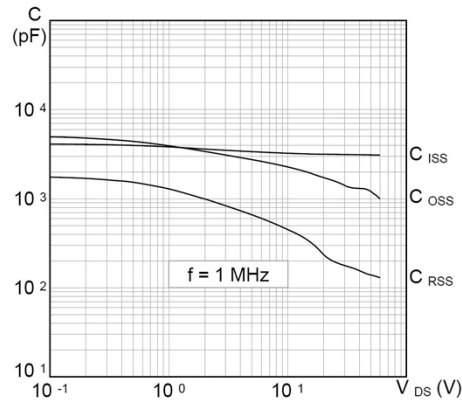
Gate charge vs gate-source voltage



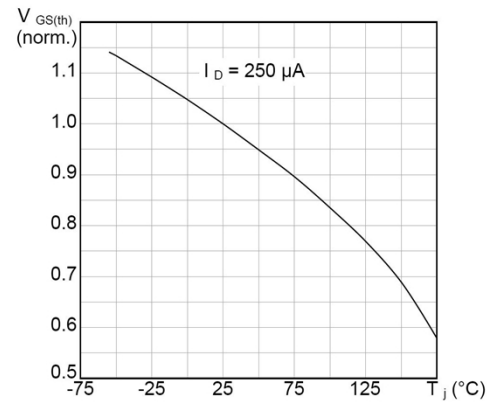
Static drain-source on-resistance



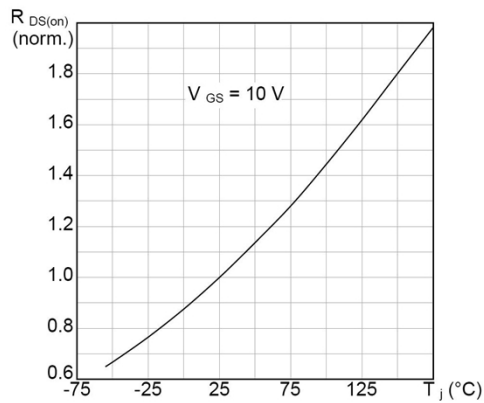
Capacitance variations



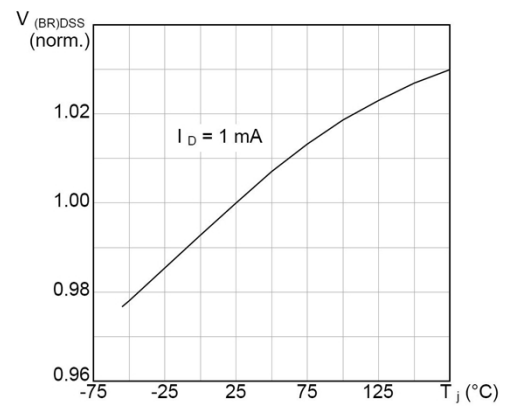
Normalized gate threshold voltage vs temperature



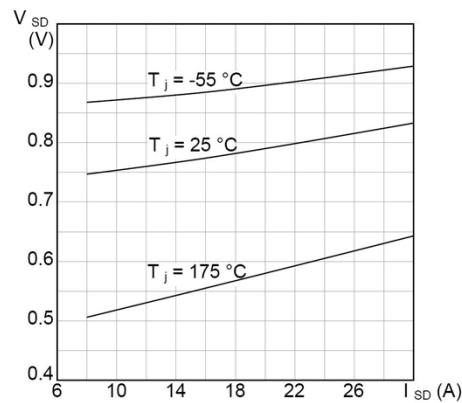
Normalized on-resistance vs temperature



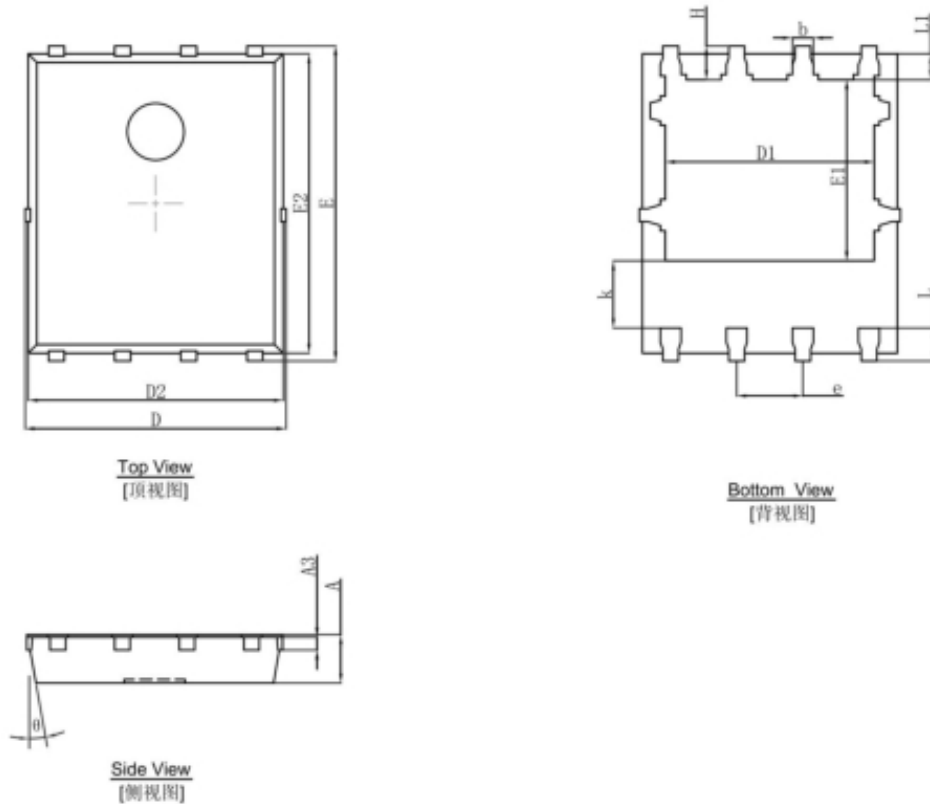
Normalized $V_{(BR)DSS}$ vs temperature



Source-drain diode forward characteristics



PDFN5X6-8L Package Information



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°