Product Summary

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

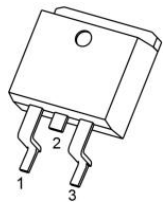
Feature

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

Application

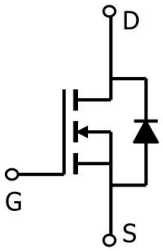
- High Speed Power Switching
- DC/DC Converters

Package

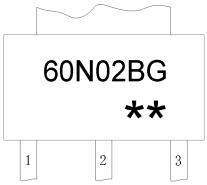


TO-263 (G:1 D:2 S:3)

Circuit diagram



Marking



60N02BG : Product code
** : Week code.

Absolute maximum ratings (Ta=25℃ 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℃, Silicon limited)	I_D	240	A
Continuous Drain Current (T_C=25℃, Package limited)	I_D	180	A
Pulsed Drain Current	I_{DM}	720	A
Single Pulse Avalanche Energy (note1)	E_{AS}	243	mJ
Power Dissipation (T_C=25℃)	P_D	220	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.57	℃/W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	°C

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

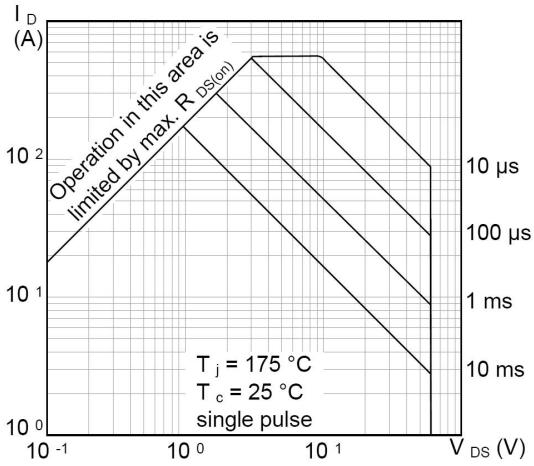
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	VGS = 0V, ID = 250μA	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	VDS = 48V, VGS = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	VGS = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	VDS = VGS, ID = 250μA	1.2	1.7	2.2	V
Drain-Source On-Resistance	$R_{DS(on)}$	VGS = 10V, ID = 40A	--	2.5	3.2	mΩ
		VGS = 4.5V, ID = 40A	--	2.9	5.2	
Dynamic Characteristics						
Input Capacitance	C_{iss}	VGS = 0V, VDS = 30V, f = 1.0MHz	--	3910	--	pF
Output Capacitance	C_{oss}		--	1300	--	
Reverse Transfer Capacitance	C_{rss}		--	11	--	
Total Gate Charge	Q_g	VDD = 30V, ID = 40A, VGS = 10V	--	53	--	nC
Gate-Source Charge	Q_{gs}		--	17	--	
Gate-Drain Charge	Q_{gd}		--	10	--	
Turn-on Delay Time	$t_{d(on)}$	VDD = 30V, VGS = 10V,ID = 40A, RG = 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	--	
Drain-Source Body Diode Characteristics						
Body Diode Voltage	V_{SD}	VGS = 0V,IS = 40A,	--	--	1.2	V
Reverse Recovery Time	t_{rr}	IF =40A, diF/dt = 100A/μs	--	48	--	ns
Reverse Recovery Charge	Q_{rr}		--	99	--	nC

Notes :

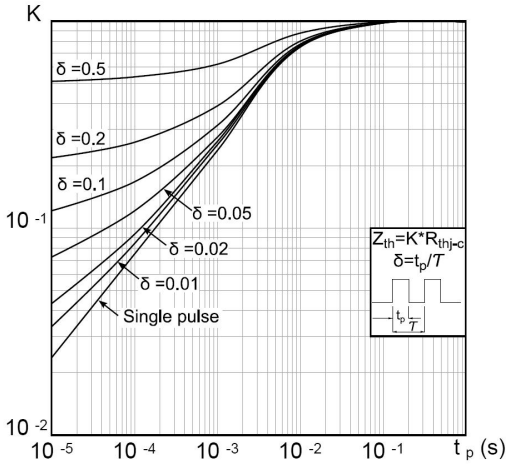
1. EAS condition: VDD = 30V, VG=10V,L=0.3mH,Rg=25Ω, TJ = 25°C.

Typical Characteristics

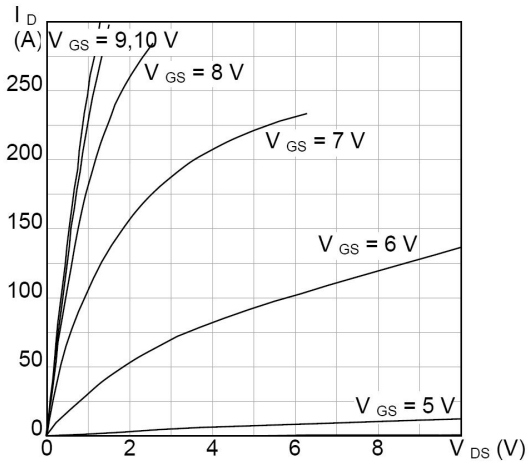
Safe operating area



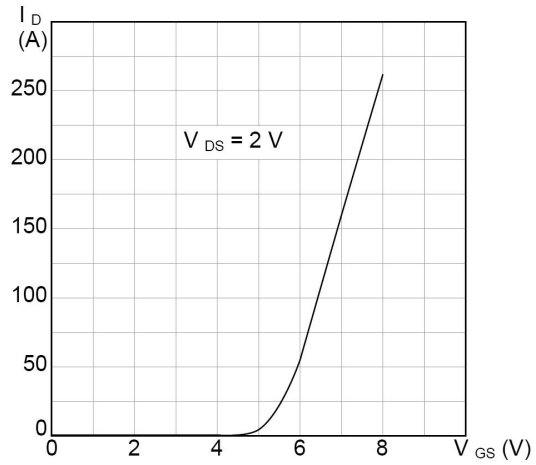
Thermal impedance



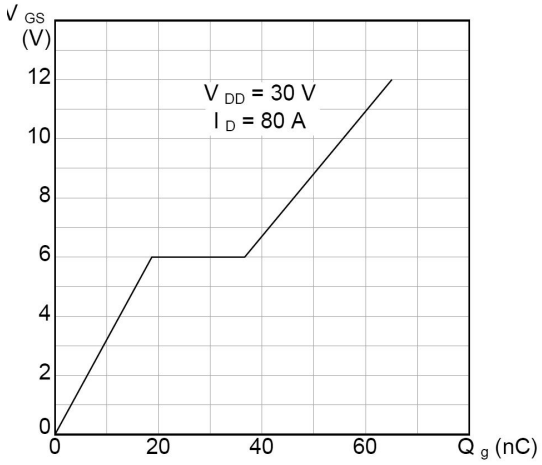
Output characteristics



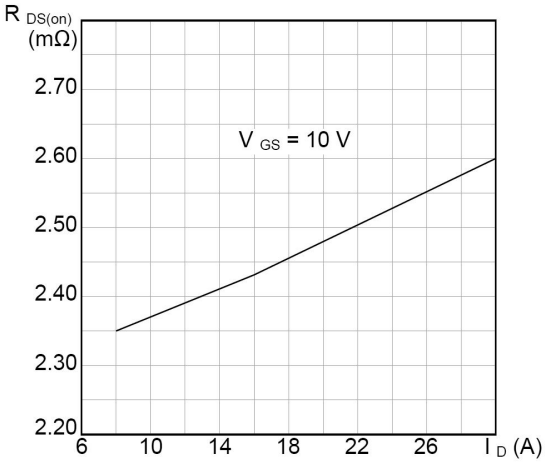
Transfer characteristics



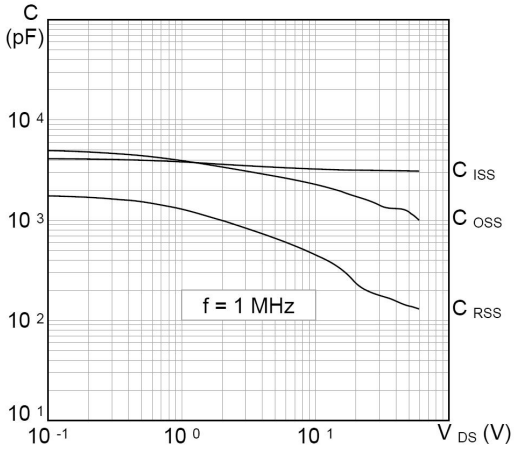
Gate charge vs gate-source voltage



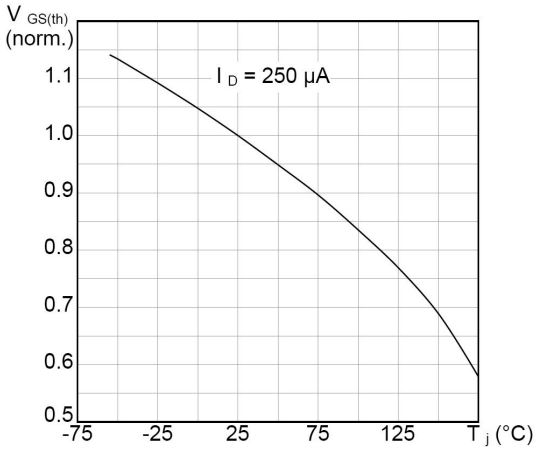
Static drain-source on-resistance



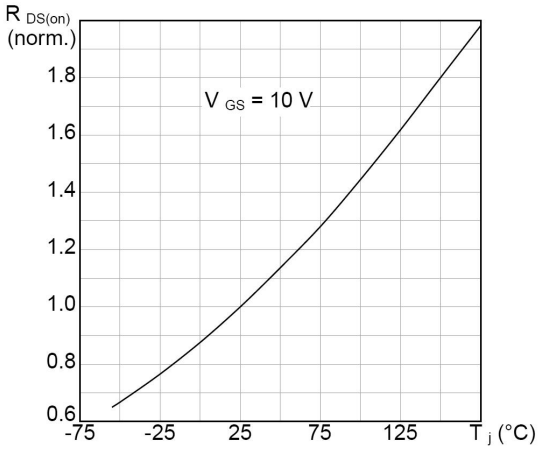
Capacitance variations



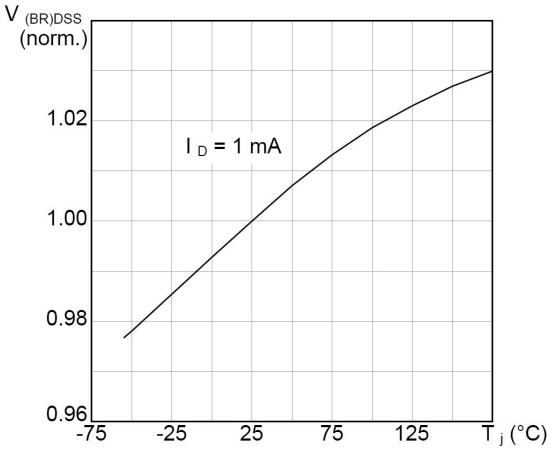
Normalized gate threshold voltage vs temperature



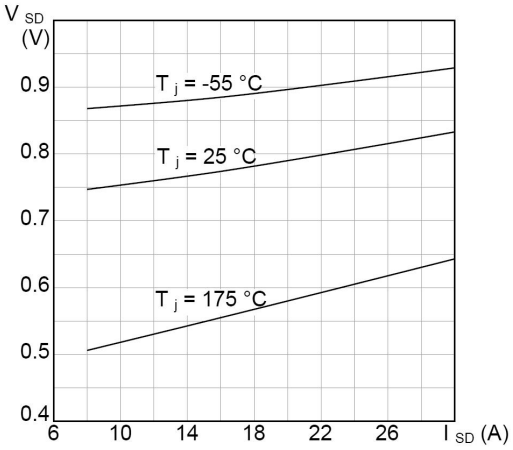
Normalized on-resistance vs temperature



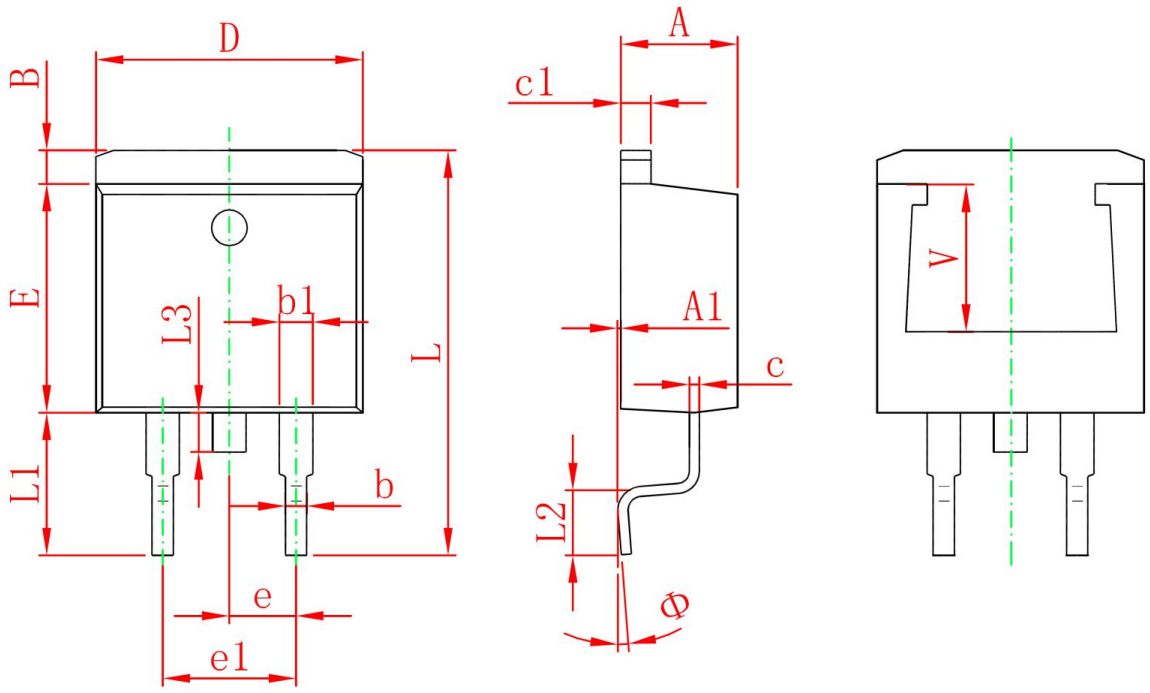
Normalized $V_{(BR)DSS}$ vs temperature



Source-drain diode forward characteristics



TO-263 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	