Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	3mΩ@10V	130A

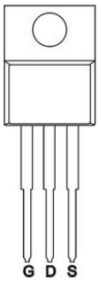
Feature

- Fast Switching
- Low Gate Charge and Rdson
- 100% Single Pulse avalanche energy Test

Applications

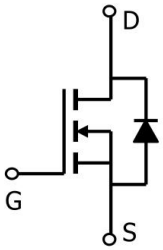
- Power switching application
- DC-DC Converter
- Power Management

Package

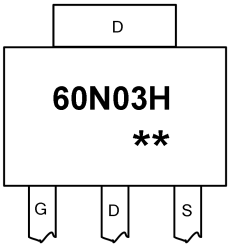


TO-220(G:1 D:2 S:3)

Circuit diagram



Marking



60N03H : Product code
**** : Week code**

Absolute maximum ratings (Ta=25℃,unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain source voltage	V_{DS}	60	V
Gate source voltage	V_{GS}	±20	V
Continuous drain current(Tc=25℃)	I_D	130	A
Pulsed drain current	I_{DM}	520	A
Power dissipation(Tc=25℃)	P_D	220	W
Single pulsed avalanche energy1)	E_{AS}	1296	mJ
Thermal resistance, junction-case	$R_{\theta JC}$	0.57	℃/W
Operation and storage temperature	T_{stg}, T_j	-55 to 150	℃

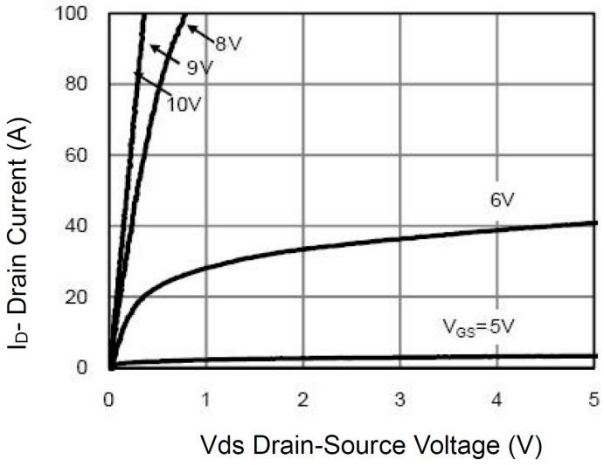
Electrical characteristics (Ta=25℃, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250μA, V_{GS} = 0V	60	-	-	V
Drain Cut-Off Current	I_{DSS}	V_{DS} = 48V, V_{GS} = 0V	-	-	1	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	-	-	±0.1	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	3.0	4.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 75A	-	3	3.8	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} =30V, V_{GS} = 0V, f = 1.0MHz	-	8520	-	pF
Output Capacitance	C_{oss}		-	687	-	
Reverse Transfer Capacitance	C_{rss}		-	573	-	
Switching Characteristics						
Total Gate Charge	Q_g	VDS=30V , VGS=10V , ID=75A	-	164	-	nC
Gate-Source Charge	Q_{gs}		-	38	-	
Gate-Drain Charge	Q_{gd}		-	61	-	
Turn-On Delay Time	$t_{d(on)}$	V_{GS} = 10V, V_{DS} = 30V, RL=0.4Ω , R_G = 2.5Ω	-	25	-	ns
Rise Time	t_r		-	23	-	
Turn-Off Delay Time	$t_{d(off)}$		-	90	-	
Fall Time	t_f		-	38	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	I_S = 1A, V_{GS} = 0V	-	-	1.2	V

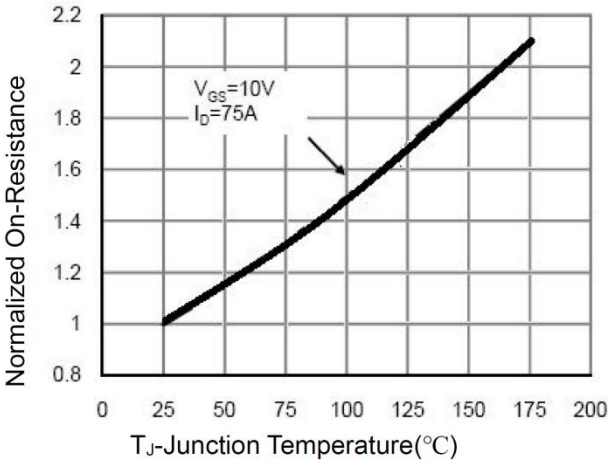
Note:

1. E_{AS} is tested at starting Tj = 25℃, V_{DD}=50V,V_{GS} = 10V,L = 0.5mH, Rg=25mΩ;

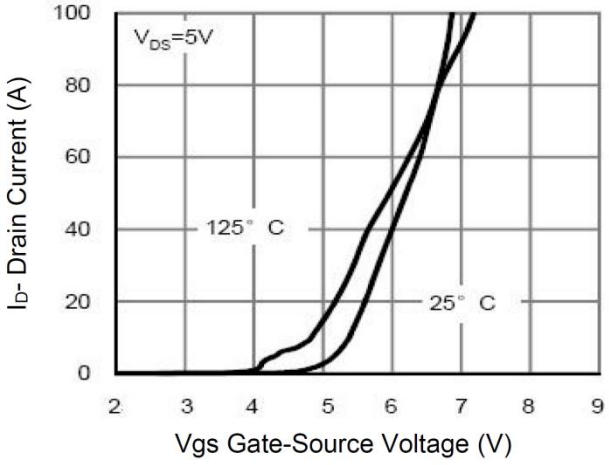
Typical Characteristics



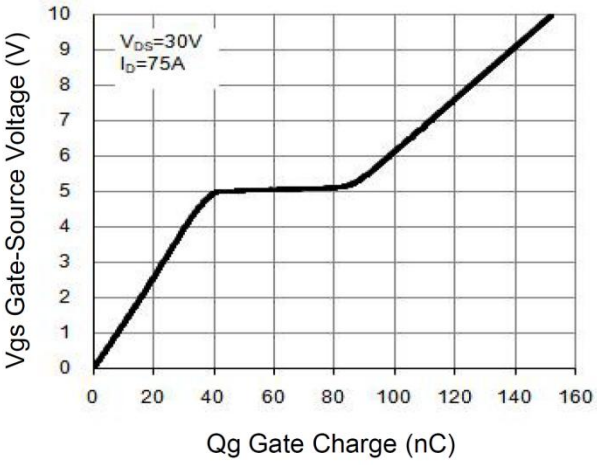
Output Characteristics



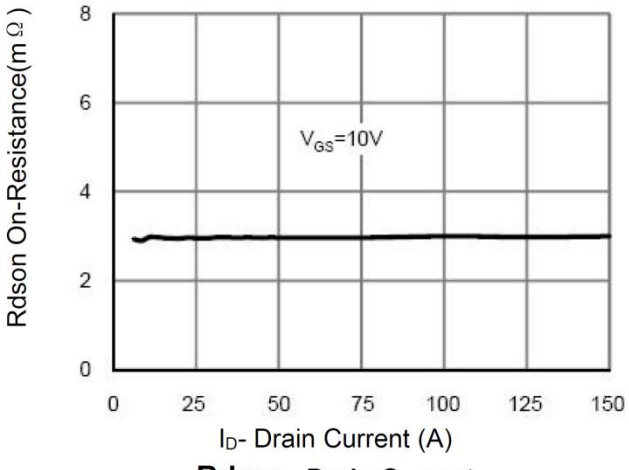
Rdson-JunctionTemperature



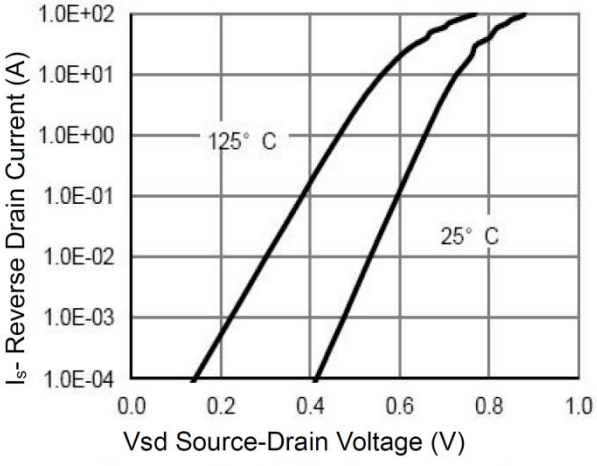
Transfer Characteristics



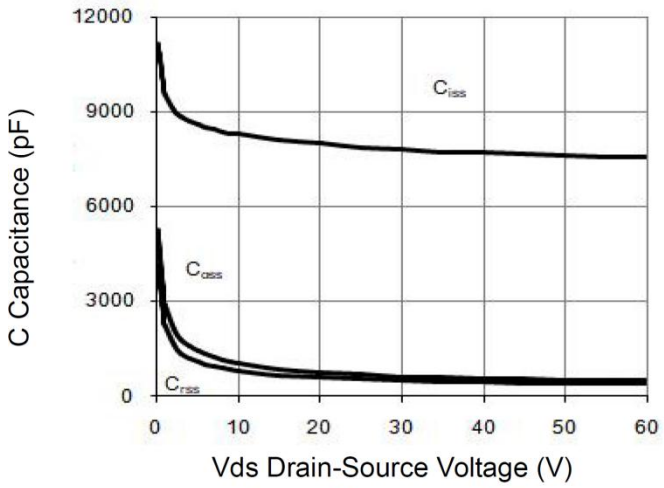
Gate Charge



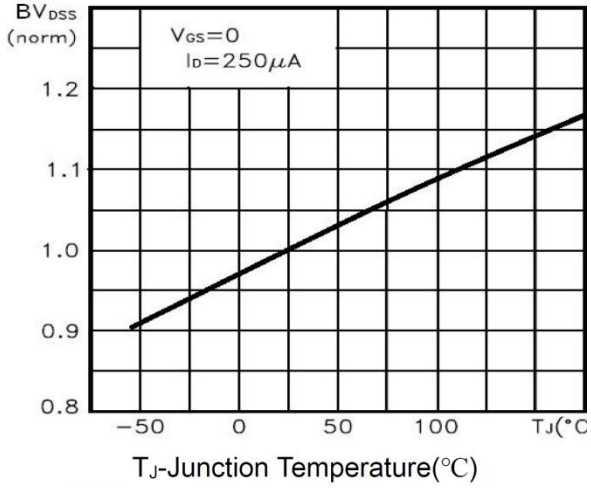
Rdson- Drain Current



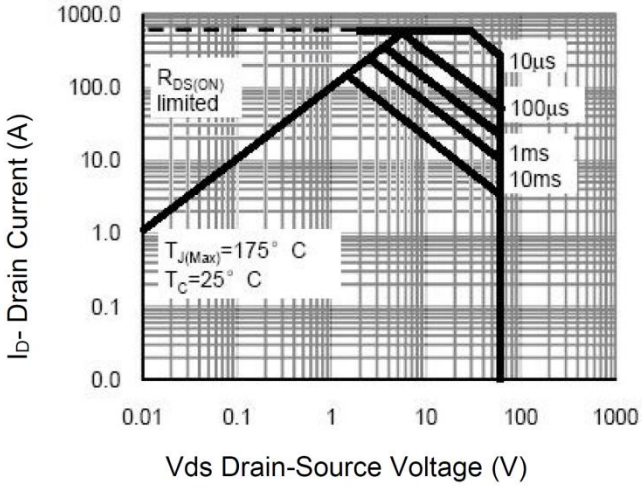
Source- Drain Diode Forward



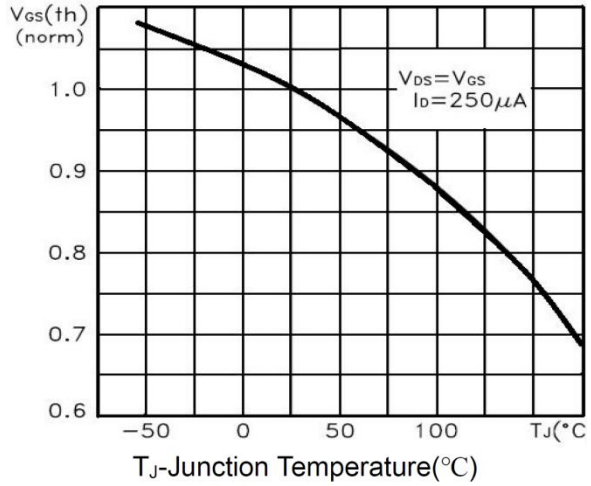
Capacitance vs Vds



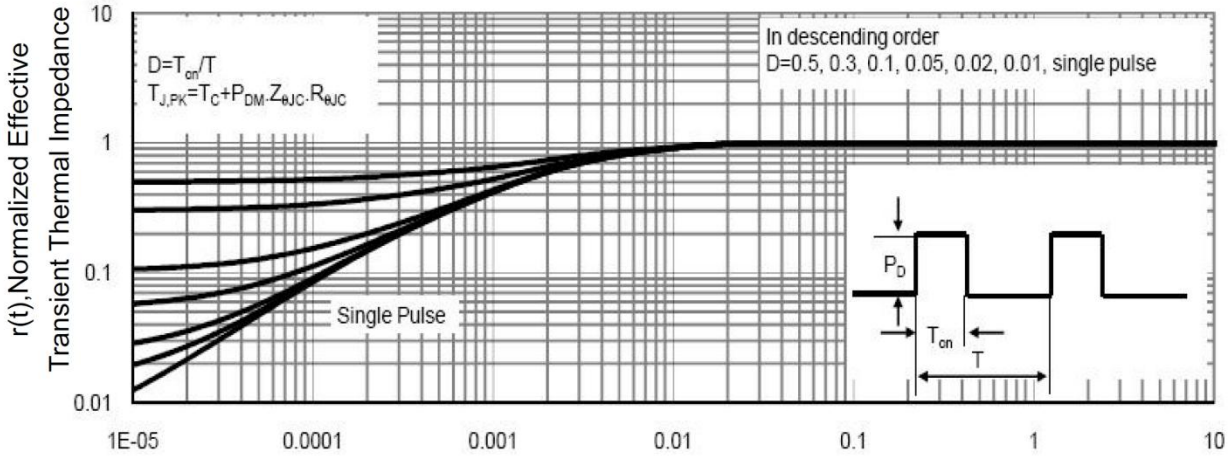
BV_{DSS} vs Junction Temperature



Safe Operation Area

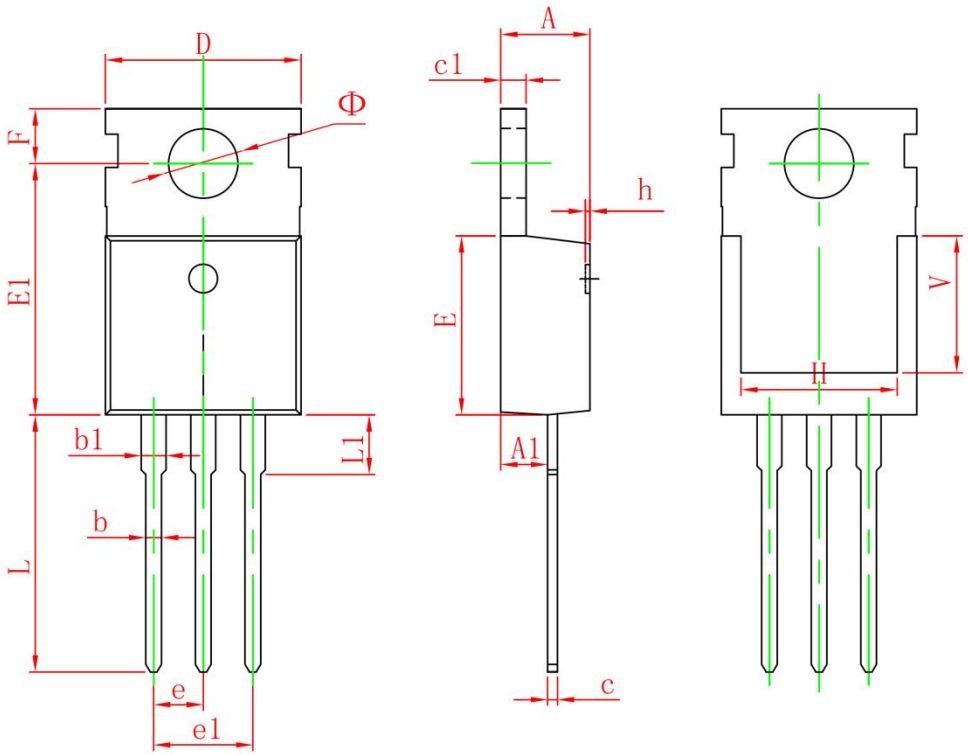


$V_{GS(th)}$ vs Junction Temperature



Normalized Maximum Transient Thermal Impedance

TO-220-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150