Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	3.7mΩ@10V	140A

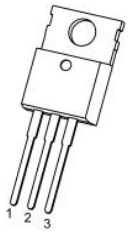
Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

Applications

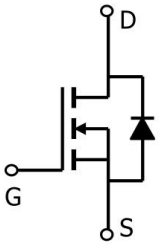
- DC-DC Converters
- Power Management

Package

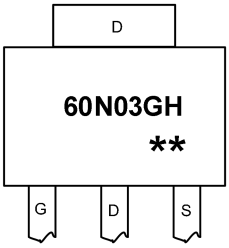


TO-220-3L-C(1:G 2:D 3:S)

Circuit diagram



Marking



60N03GH =Device Code
**** =Week Code**

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current1 (Tc=25℃)	I_D	140	A
Pulsed Drain Current[2]	I_{DM}	560	A
Single Pulse Avalanche Energy[3]	E_{AS}	961	mJ
Total Power Dissipation[4] (Tc=25℃)	P_D	140	W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	0.89	℃/W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

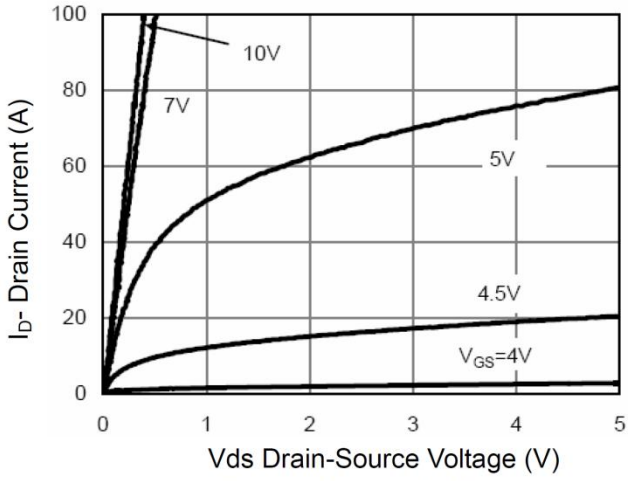
Electrical characteristics (Ta=25℃, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V , ID=250uA	60	---	---	V
Drain-Source Leakage Current	I_{DSS}	VDS=48V , VGS=0V	---	---	1	uA
Gate-Source Leakage Current	I_{GSS}	VGS=±20V , VDS=0V	---	---	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS , ID =250uA	2.0	2.5	4.0	V
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	VGS=10V , ID=20A	---	3.7	4.7	mΩ
Dynamic characteristics						
Input Capacitance	C_{iss}	VDS=30V , VGS=0V , f=1MHz	---	4250	---	pF
Output Capacitance	C_{oss}		---	975	---	
Reverse Transfer Capacitance	C_{rss}		---	41	---	
Switching Characteristics						
Total Gate Charge	Q_g	VDS=30V , VGS=10V , ID=20A	---	68	---	nC
Gate-Source Charge	Q_{gs}		---	19	---	
Gate-Drain Charge	Q_{gd}		---	14	---	
Turn-On Delay Time	$T_{d(on)}$	VDD=30V , VGS=10V , RG=4.7Ω, ID=20A	---	6	---	ns
Rise Time	T_r		---	12	---	
Turn-Off Delay Time	$T_{d(off)}$		---	24	---	
Fall Time	T_f		---	5	---	
Diode Characteristics						
Diode Forward Voltage2	V_{SD}	VGS=0V , IS=1A , TJ=25℃	---	---	1.2	V

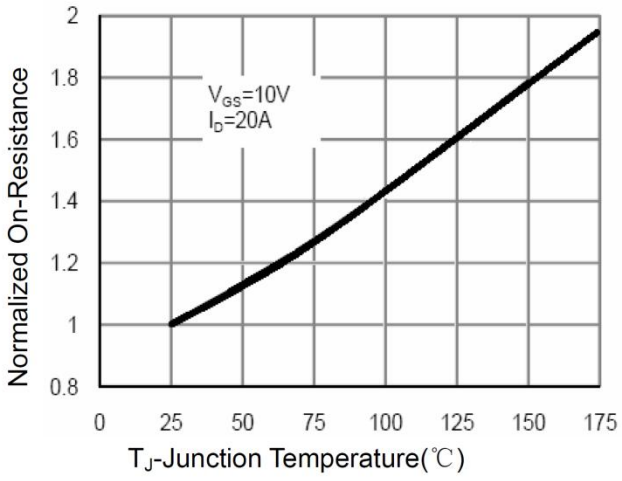
Note :

1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3. The EAS data shows Max. rating . The test condition is VDD=30V,VGS=10V,L=0.5mH,RG=25Ω
4. The power dissipation is limited by 150℃ junction temperature
5. The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

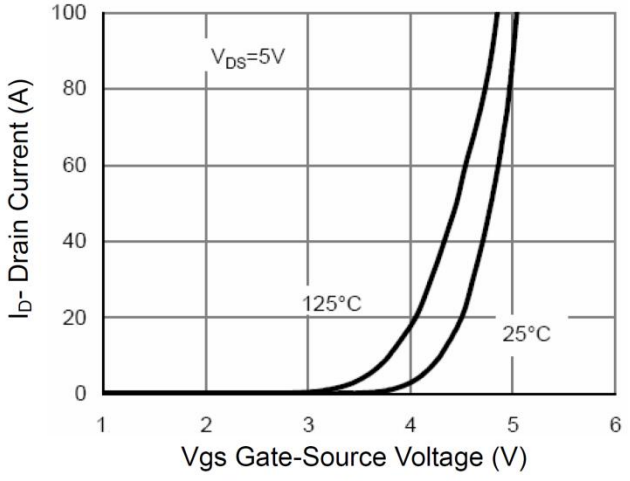
Typical Characteristics



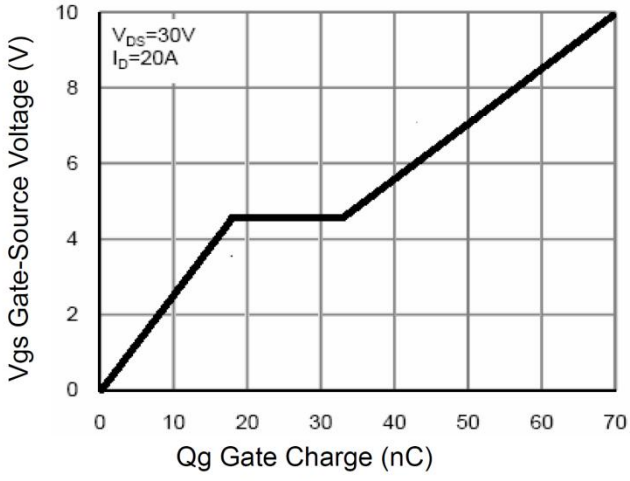
Output Characteristics



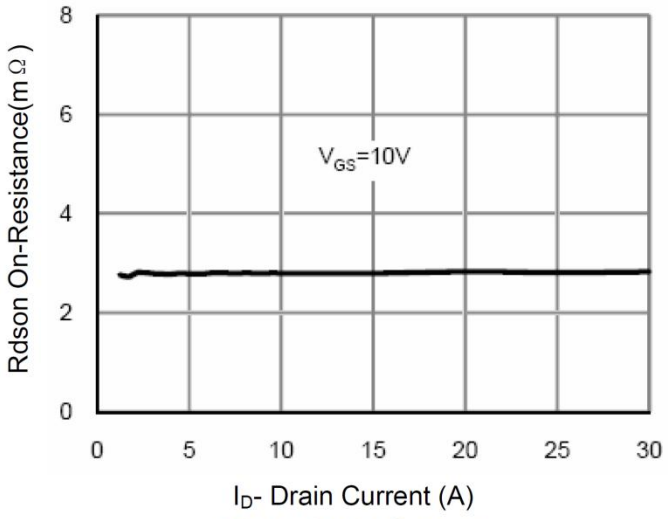
Rdson-Junction Temperature



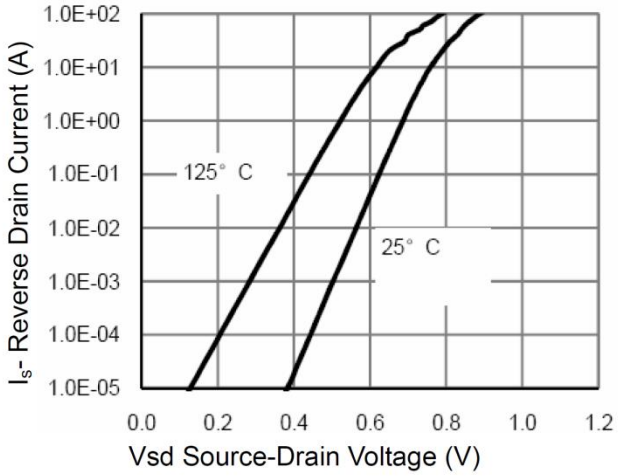
Transfer Characteristics



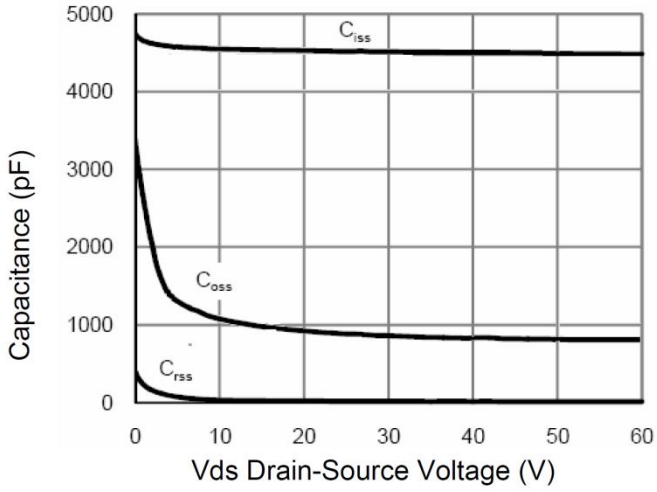
Gate Charge



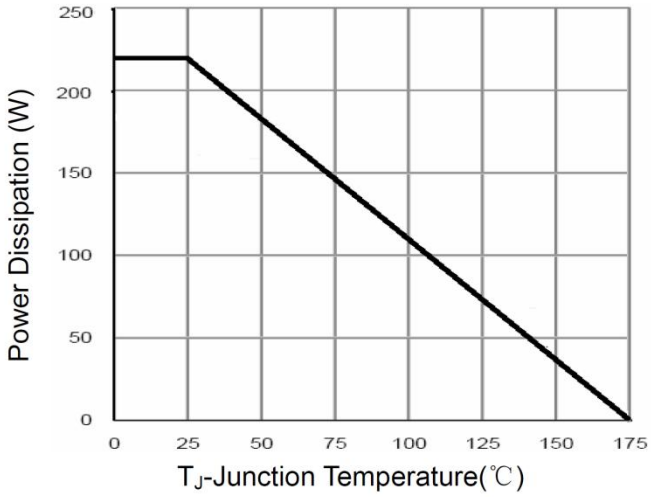
Rdson- Drain Current



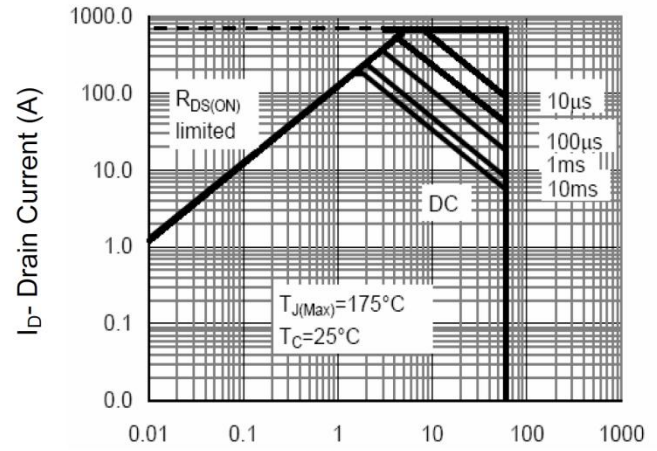
Source- Drain Diode Forward



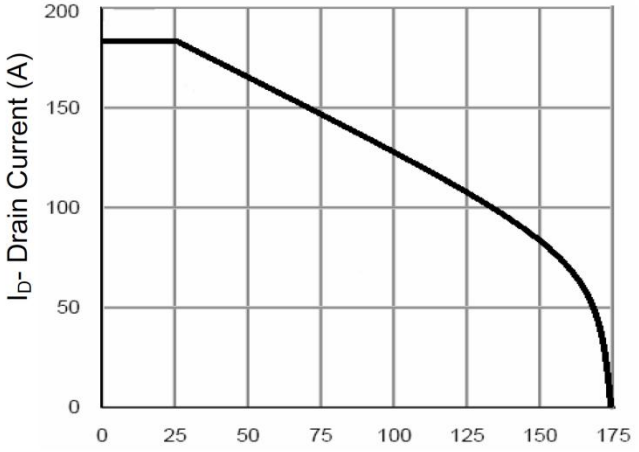
Capacitance vs Vds



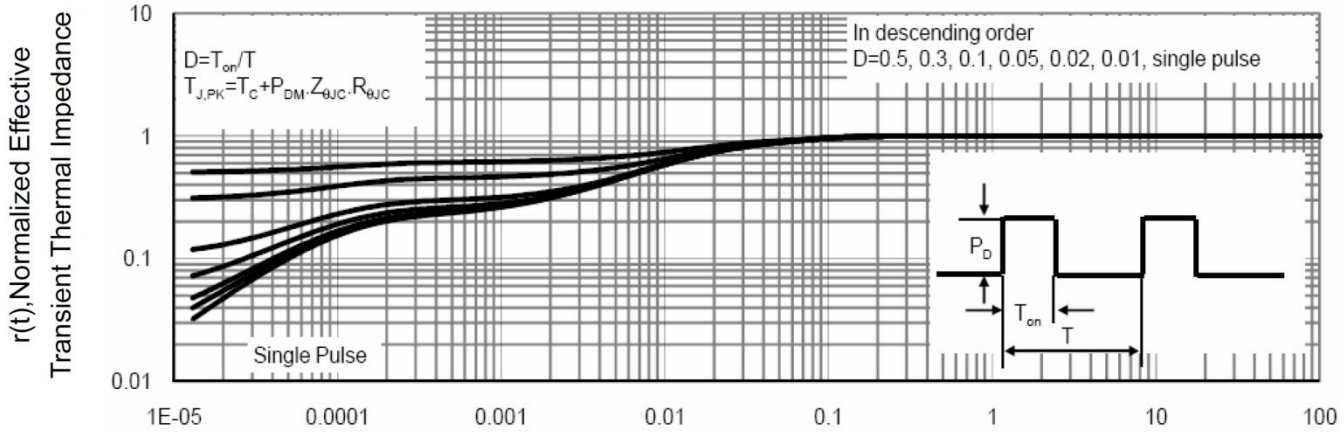
Power De-rating



Safe Operation Area

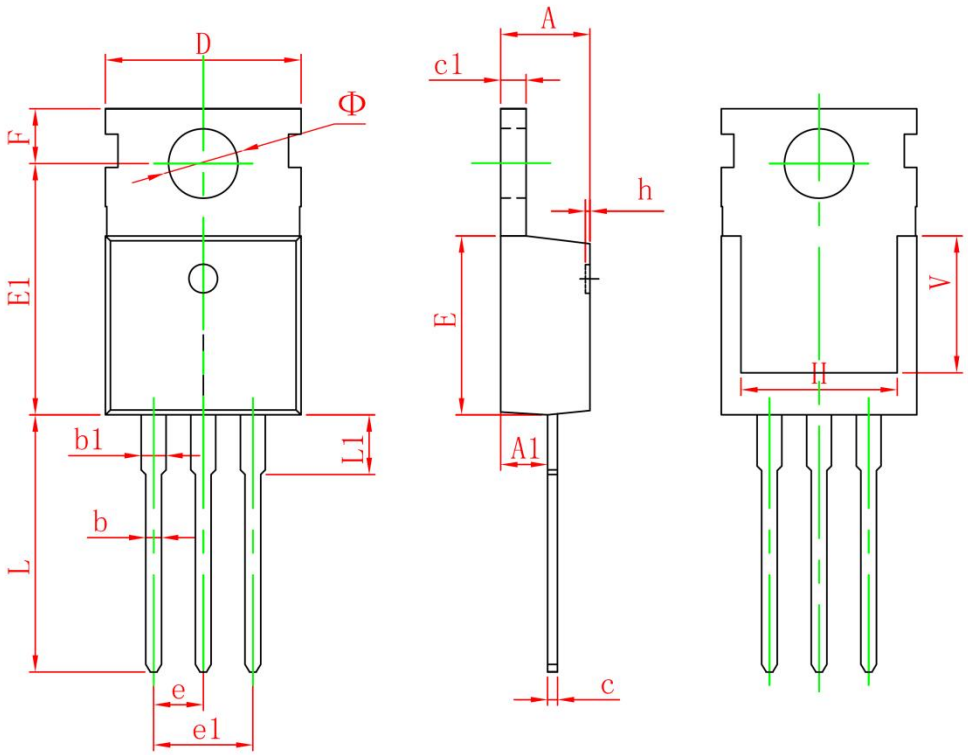


Current De-rating



Normalized Maximum Transient Thermal Impedance

TO-220-3L-C 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

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