

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
120V	3.2mΩ@10V	140A

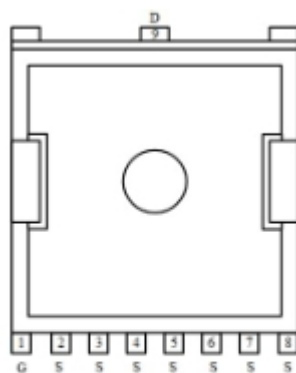
Feature

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

Applications

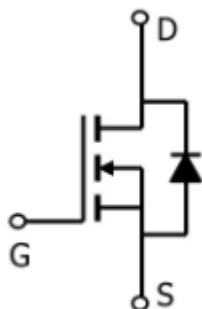
- High Speed Power switching
- DC-DC Converter
- Power Management

Package

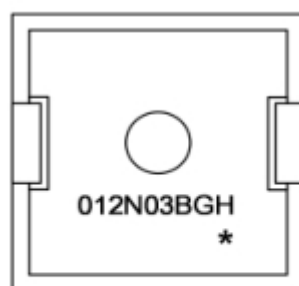


TOLL

Circuit diagram



Marking



012N03BGH : Product code
* : Month code

Absolute maximum ratings

(T_a=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	120	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous(T _C = 25°C)	I _D	140	W
Pulsed Drain Current ²	I _{DM}	560	A
Power Dissipation ⁴ (T _C = 25°C)	P _D	240	W
Single Pulse Avalanche Energy ¹	E _{AS}	1296	mJ
Thermal Resistance Junction- Case	R _{θJC}	0.52	°C/ W
Operation and storage temperature	T _{STG} , T _J	-55~ +150	°C

Electrical characteristics

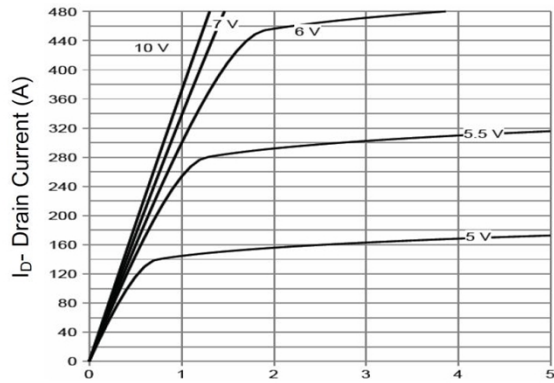
(T_A=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	120			V
Drain Cut-Off Current	I _{DSS}	V _{DS} =96V,V _{GS} = 0V			1	uA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V , V _{DS} =0V			±0.1	uA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.6	3.1	3.6	V
Drain-Source ON Resistance	R _{DS(on)}	V _{GS} =10V, I _D =50A		3.2	4	Ω
Dynamic characteristics ⁴						
Input Capacitance	C _{iss}	V _{DS} =60V,V _{GS} =0V, f=1MHz		8505		pF
Output Capacitance	C _{oss}			620		
Reverse Transfer Capacitance	C _{rss}			71		
Switching Characteristics						
Total Gate Charge(4.5V)	Q _g	V _{DS} =60V, V _{GS} =10V, I _D =75A		152		nC
Gate-Source Charge	Q _{gs}			43		
Gate-Drain Charge	Q _{gd}			46		
Turn-On Delay Time	T _{d(on)}	V _{GS} =10V, V _{DS} =50V, I _D =75A, R _G =1.6Ω		25		nS
Rise Time	T _r			15		
Turn-Off Delay Time	T _{d(off)}			52		
Fall Time	T _f			18		
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _S = 1A, V _{GS} = 0V			1.2	V

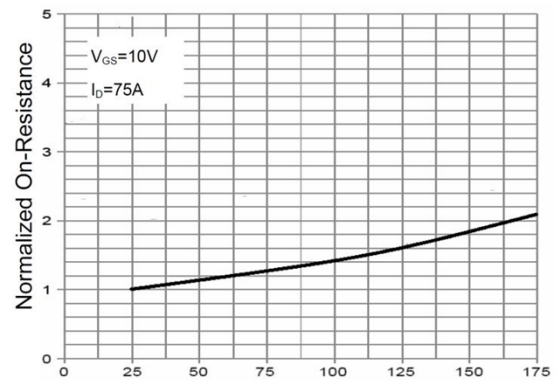
Note :

1. E_{AS} is tested at starting T_j = 25°C, V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH, R_G = 25 Ω;

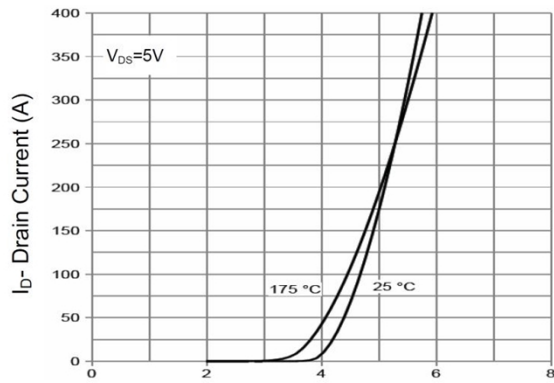
Typical Characteristics



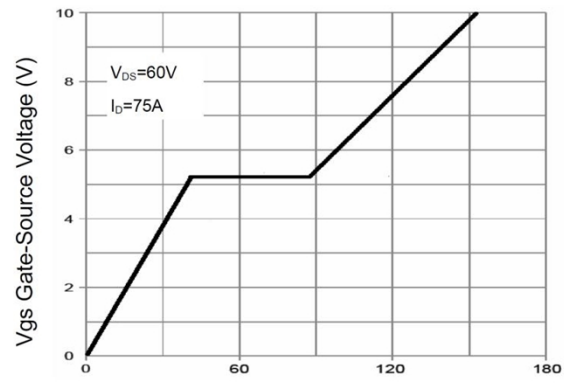
V_{DS} Drain-Source Voltage (V)
Output Characteristics



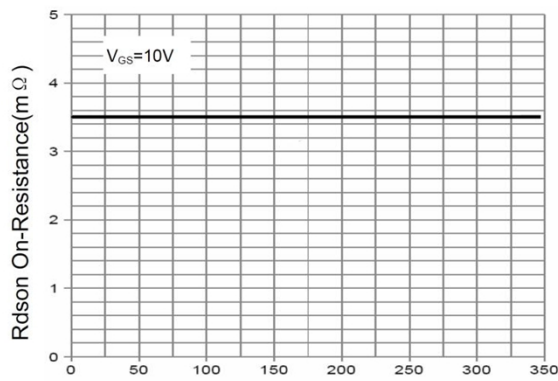
T_J -Junction Temperature(°C)
 R_{dson} -Junction Temperature



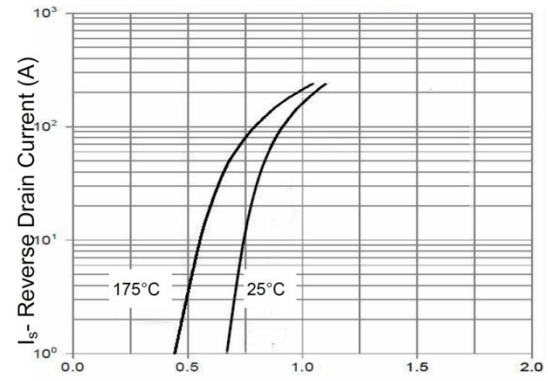
V_{GS} Gate-Source Voltage (V)
Transfer Characteristics



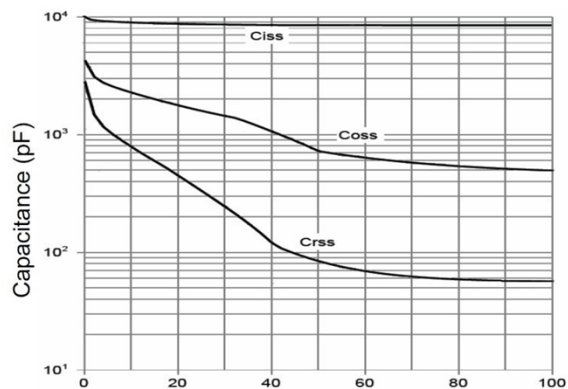
Q_g Gate Charge (nC)
Gate Charge



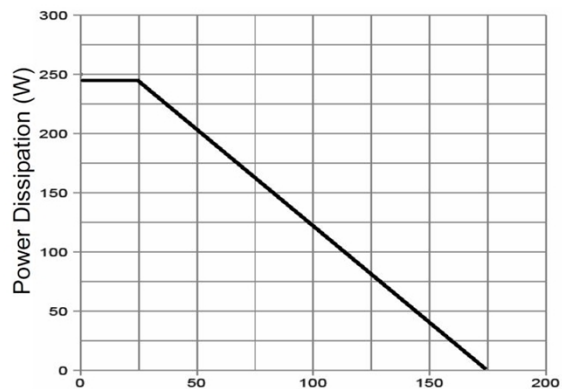
I_D - Drain Current (A)
 R_{dson} - Drain Current



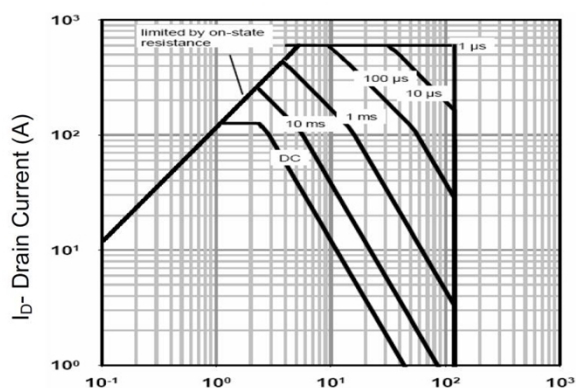
V_{SD} Source-Drain Voltage (V)
Source- Drain Diode Forward



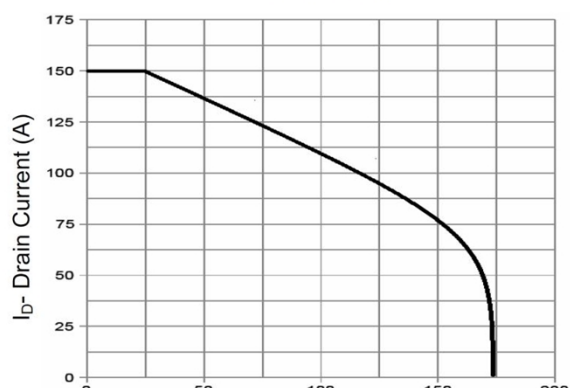
V_{ds} Drain-Source Voltage (V)
Capacitance vs V_{ds}



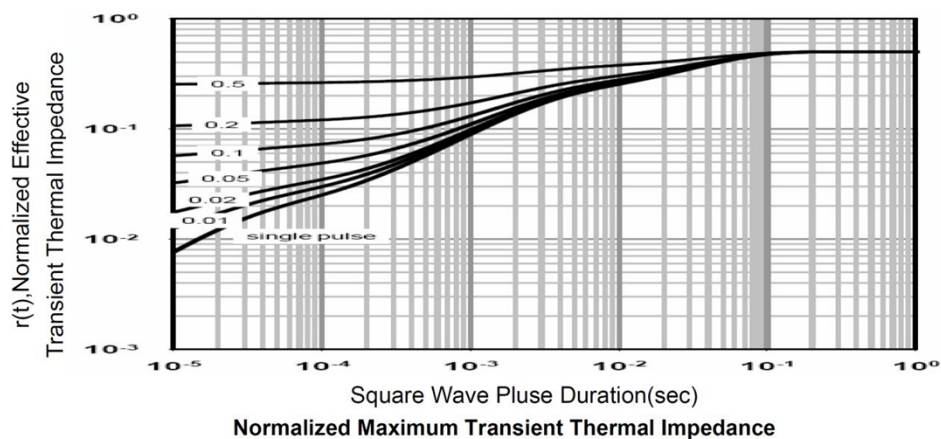
T_c-Case Temperature (°C)
Power De-rating



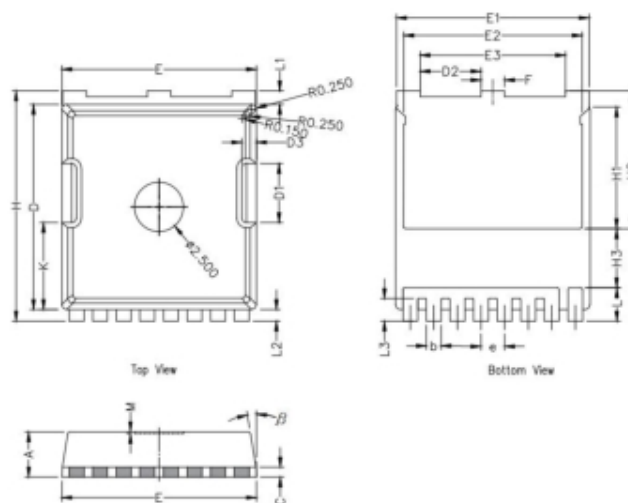
V_{ds} Drain-Source Voltage (V)
Safe Operation Area



T_c-Case Temperature (°C)
Current De-rating



TOLL Package Outline Dimensions



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	2.20	2.30	2.40
b	0.65	0.75	0.85
C	0.508 REF		
D	10.25	10.40	10.55
D1	2.85	3.00	3.15
E	9.75	9.90	10.05
E1	9.65	9.80	9.95
E2	8.95	9.10	9.25
E3	7.25	7.40	7.55
e	1.20 BSC		
F	1.05	1.20	1.35
H	11.55	11.70	11.85
H1	6.03	6.18	6.33
H2	6.85	7.00	7.15
H3	3.00 BSC		
L	1.55	1.70	1.85
L1	0.55	0.7	0.85
L2	0.45	0.6	0.75
M	0.08 REF.		
β	8°	10°	12°
K	4.25	4.40	4.55