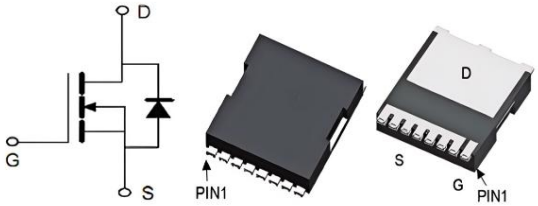
N-Channel Power MOSFET 120V/300A

Parameter	Value	Unit
VDS	120	V
RDS(on)	1.9	mΩ
ID	300	A



TOLL

FEATURES

- 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 Managemen

MAXIMUM RATED VALUES(Ta=25℃ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current1 (Tc=25℃)	I_D	300	A
Continuous Drain Current1 (Tc=100℃)	I_D	200	A
Pulsed Drain Current	I_{DM}	1200	A
Single Pulse Avalanche Energy[1]	E_{AS}	2056	mJ
Power Dissipation (Tc=25℃)	P_D	320	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.39	℃/W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

ELECTRICAL CHARACTERISTICS (at TJ = 25°C unless otherwise specified)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	ID = 250μA, VGS = 0V	120	130	-	V
Drain Cut-Off Current	I_{DSS}	VDS = 96V, VGS = 0V	-	-	1	μA
Gate Leakage Current	I_{GSS}	VGS = ±20V, VDS = 0V	-	-	±0.1	
Gate Threshold Voltage	$V_{GS(th)}$	VDS = VGS, ID = 250μA	2.5	3.3	4.5	V
Drain-Source ON Resistance	$R_{DS(ON)}$	VGS = 10V, ID = 50A	-	1.9	2.5	mΩ

Dynamic Characteristics						
Input Capacitance	C_{iss}	VDS = 60V, VGS = 0V, f = 1.0MHz	-	10423	-	pF
Output Capacitance	C_{oss}		-	713	-	
Reverse Transfer Capacitance	C_{rss}		-	40	-	
Total Gate Charge	Q_g	VDS=60V , VGS=10V , ID=75A	-	175	-	nC
Gate-Source Charge	Q_{gs}		-	47.5	-	
Gate-Drain Charge	Q_{gd}		-	48.5	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	VGS = 10V, VDS = 60V, ID = 75A RG = 1.6Ω	-	20	-	nS
Rise Time	t_r		-	23	-	
Turn-Off Delay Time	$t_{d(off)}$		-	65	-	
Fall Time	t_f		-	25	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	I_S = 1A, V_{GS} = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	300	A
Reverse Recovery Time	T_{rr}	I_S=100A, di/dt=100A/us, TJ=25℃	-	112	-	nS
Reverse Recovery Charge	Q_{rr}		-	289	-	nC

Note:
1.The test condition is VDD=50V,VGS=10V,L=0.5mH,RG=25Ω

CHARACTERISTICS DIAGRAMS

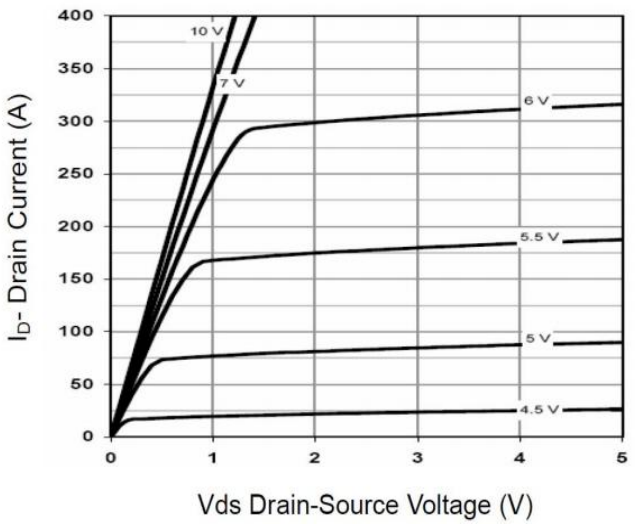


Fig.1 Output Characteristics

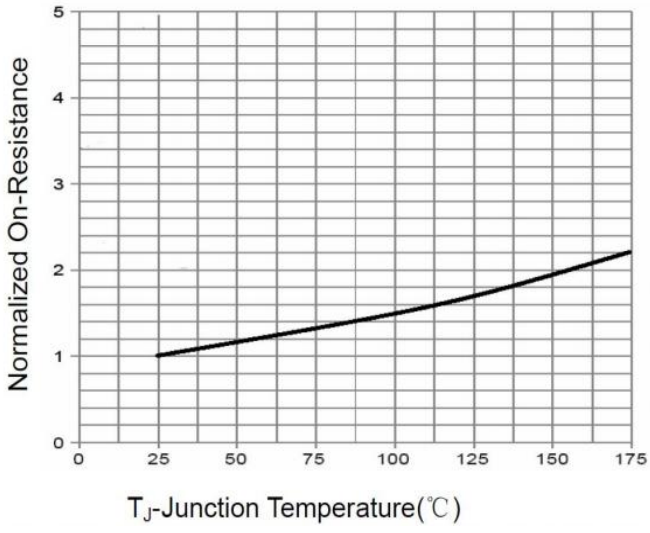


Fig.2 Rdson Vs Junction Temperature

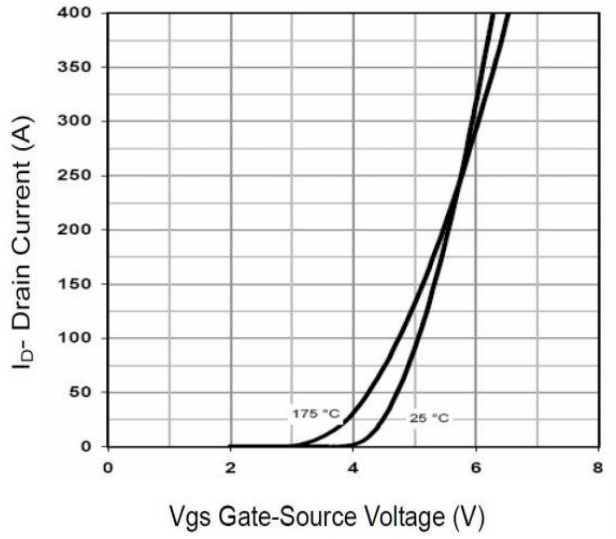


Fig.3 Transfer Characteristics

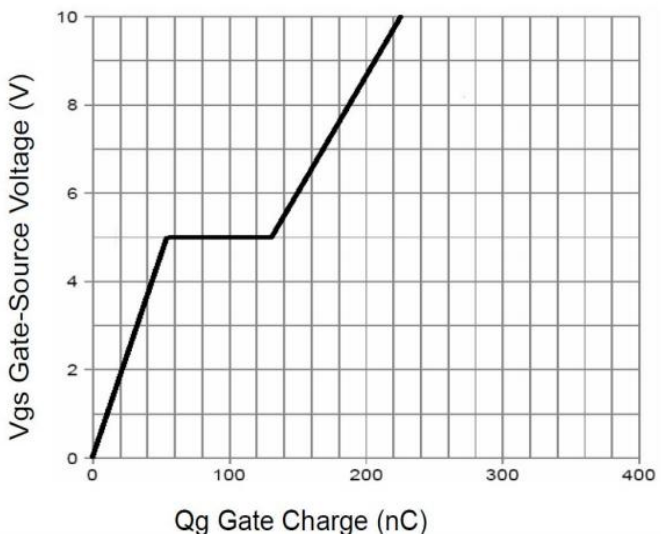


Fig.4 Gate Charge

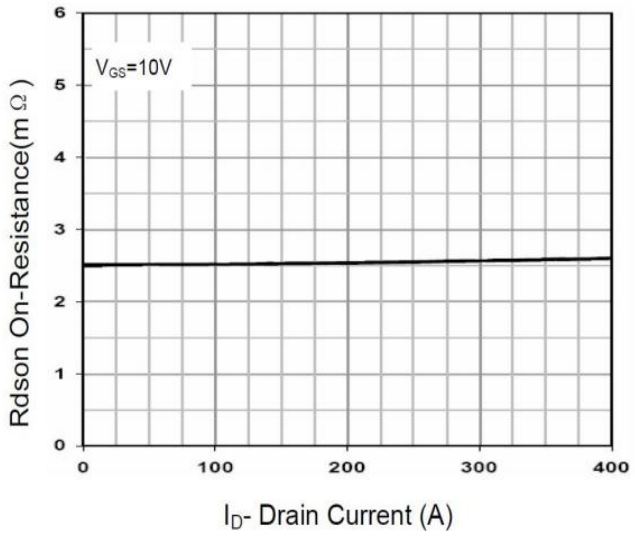


Fig.5 Rdson-Drain Current

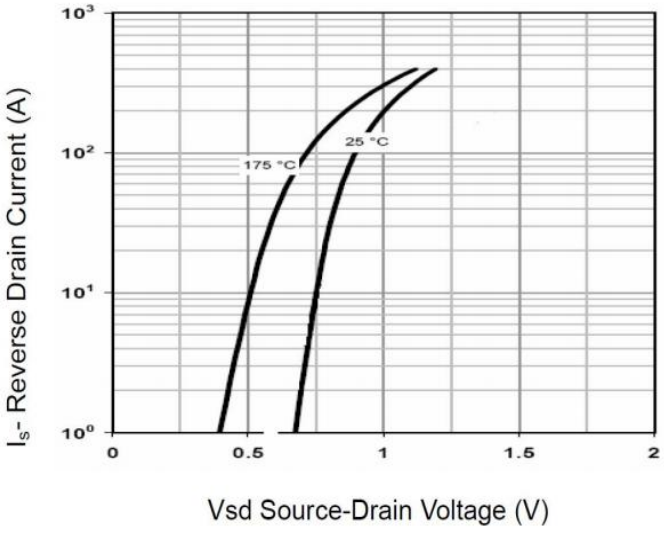


Fig.6 Source-Drain Diode Forward

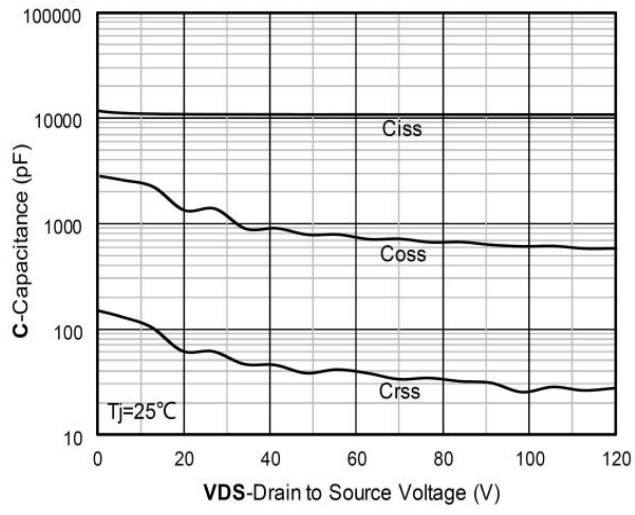


Fig.7 Capacitance vs Vds

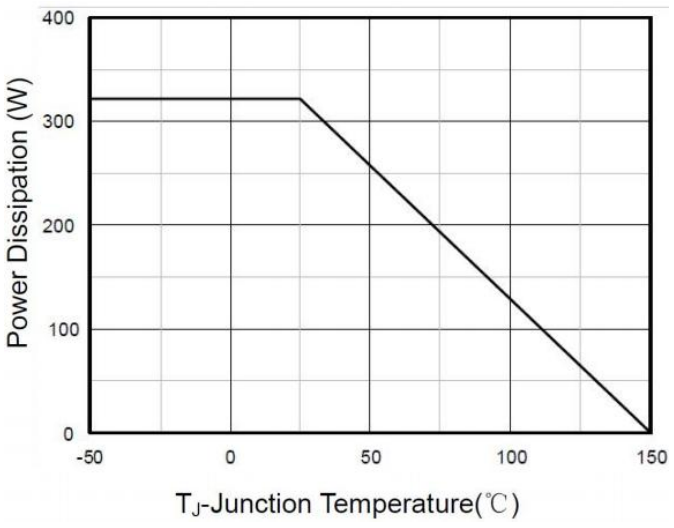


Fig.8 Power De-rating

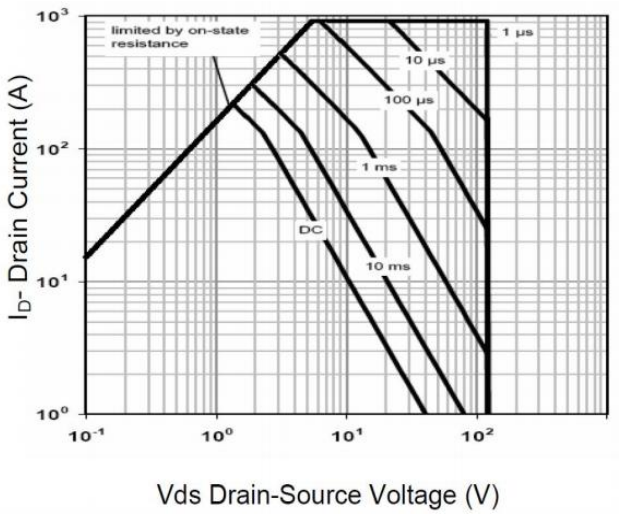


Fig.9 Safe Operation Area

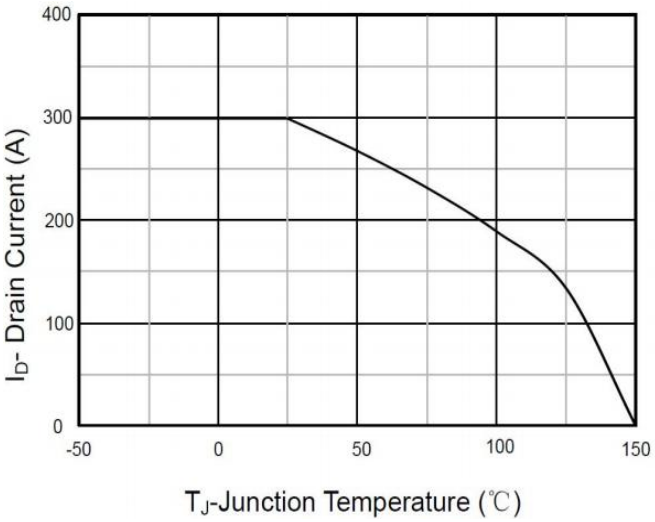


Fig.10 Current De-rating

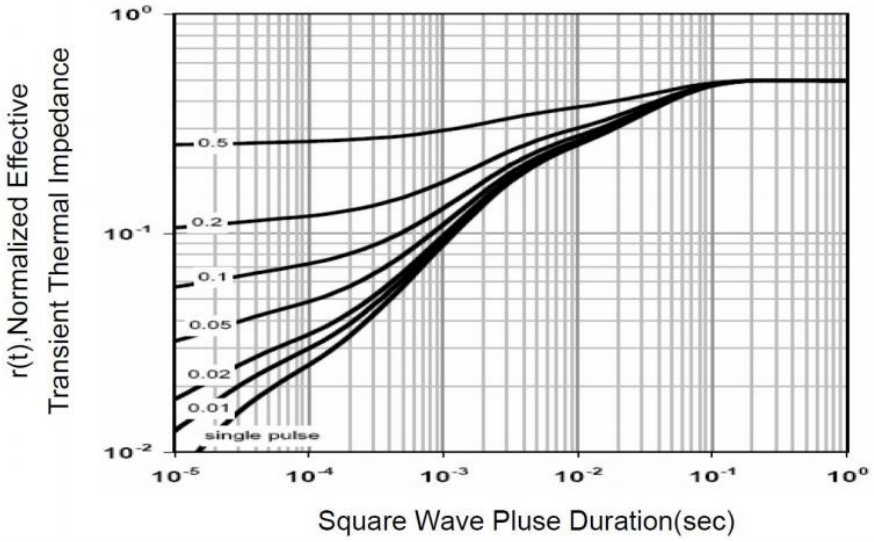
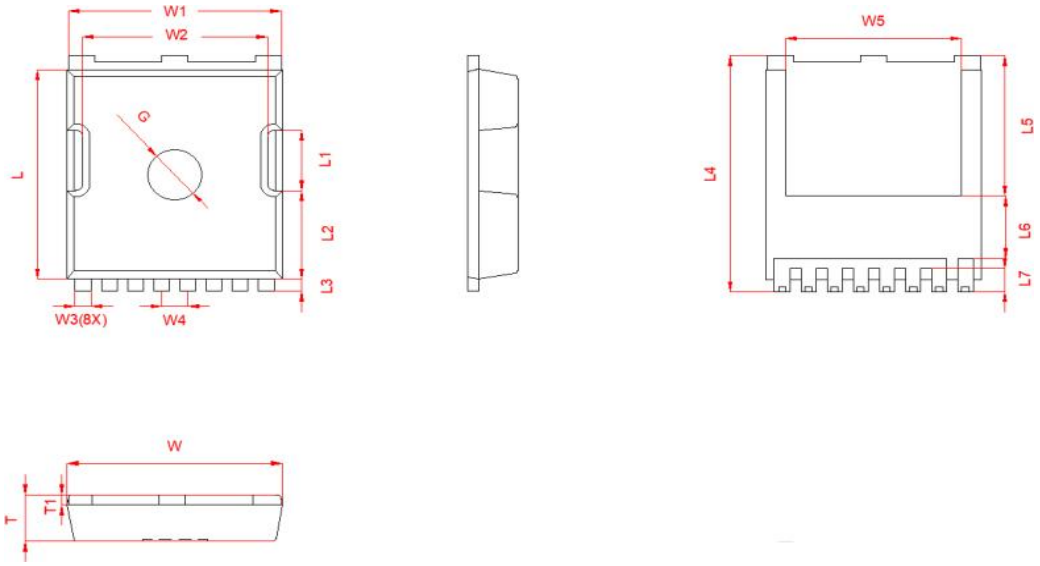


Fig.11 Normalized Maximum Transient Thermal Impedance

PACKAGE OUTLINE



Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max
W	9.7	10.1	L	10.28	10.58	L6	(3.1)	
W1	9.7	9.9	L1	(3.0)		L7	1.1	1.3
W2	(8.5)		L2	4.2	4.6	T	2.2	2.4
W3	0.6	0.85	L3	0.5	0.7	T1	0.4	0.6
W4	1.1	1.3	L4	11.48	11.88	G(Φ)	(2.5)	
W5	(8.1)		L5	(6.9)				

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