100V N-Channel Power MOSFET

V_{DS}	100V
I_{D_MAX}	415A
$R_{DS(ON)\_MAX}$ @V_{GS}=10V	1.5mΩ

DESCRIPTION：
- High Speed Power Switching
- Low On-Resistance
- 100% UIS Tested, 100% Rg Tested
- RoHS compliant
- Halogen Free

TOLL

TYPICAL APPLICATIONS：
- DC/DC in Telecoms and Industrial
- Synchronous Rectification in SMPS
- Hard Switching and High Speed Circuit

MAXIMUM RATINGS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	415 293	A
Pulse Drain Current (1)		I_{DM}	1589	A
Single Pulse Avalanche Energy (2)		E_{AS}	2132	mJ
Single Pulse Avalanche Current	L=0.3mH	I_{AS}	78	A
Maximum Power Dissipation	Tc=25℃ Tc=100℃	P_D	500 250	W
Junction & Storage Temperature Range		T_J , T_{STG}	-55~+175	℃

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	25	℃/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	0.30	℃/W

Notes:
1.This current is calculated on single pulse with 10us Single Pulse.
2. Defined by design, not subject to production test, EAS condition: TJ=25°C, VDD=50V, VGS=10V, L=1.0mH.

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	100			V
Zero Gate Voltage Drain Current VDS = 100 V, VGS = 0 V Tj=25℃ VDS = 100 V, VGS = 0 V Tj=125℃	I_{DSS}			1 100	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source Threshold Voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	2.0	3.0	4.0	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A	$R_{DS(ON)}$		1.2	1.5	mΩ
Forward Transconductance VDS = 5V, ID = 20A	$G_{fS)}$		72		S
Input capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{iss}		11930		pF
Output capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{oss}		2720		pF
Reverse transfer capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{rss}		71		pF
Gate Resistance f=1MHz, VDS=0 V, VGS=0 V	R_g		1.6		Ω
Total Gate Charge VDS= 50V, ID= 20A,VGS= 10V	Q_G		154		nC
Gate to Source Charge VDS= 50V, ID= 20A,VGS= 10V	Q_{GS}		46		nC
Gate to Drain Charge VDS= 50V, ID= 20A,VGS= 10V	Q_{GD}		29		nC
Turn-on delay time VDS=50 V, ID=20A, VGS= 10V, R_{GEN}=3Ω	td $_{(ON)}$		26		ns
Rise time VDS=50 V, ID=20A, VGS= 10V, R_{GEN}=3Ω	tr		35		ns
Turn-off delay time VDS=50 V, ID=20A, VGS= 10V, R_{GEN}=3Ω	td $_{(OFF)}$		94		ns
Fall time VDS=50 V, ID=20A, VGS= 10V, R_{GEN}=3Ω	tf		49		ns

Body Diode

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Forward Voltage VGS = 0V, I_S = 2.0A Tj=25℃	V_{SD}		0.7	1.2	V
Diode Forward Current Tj=25℃	I_S			415	A
Revers Recovery Time IF=20A, dI/dt = 100A/us□Tj=25℃	Trr		107		ns
Revers Recovery Charge IF=20A, dI/dt = 100A/us□Tj=25℃	Qrr		229		nC

Typical Electrical and Thermal Characteristics

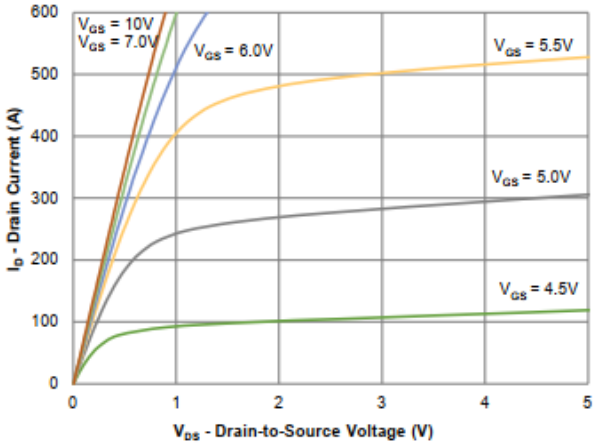


Figure 1. Typical output characteristics (Tj=25℃)

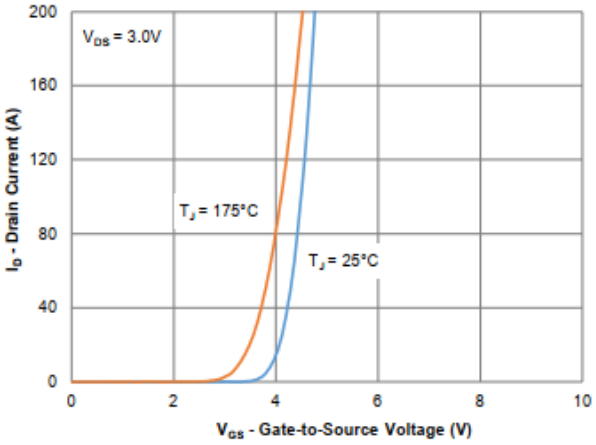


Figure 2. Typical Transfer Characteristics

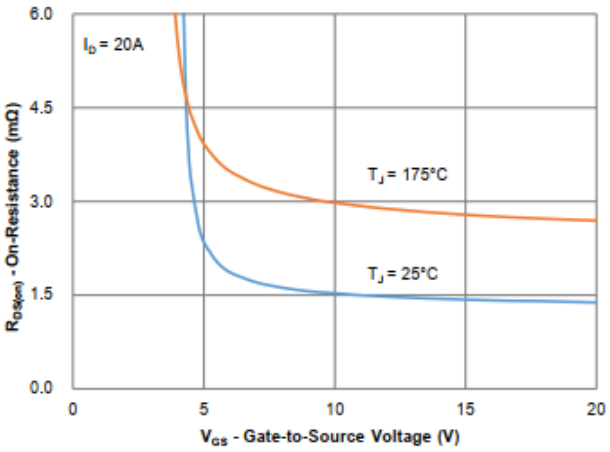


Figure 3. On-Resistance vs. Gate-Source Voltage

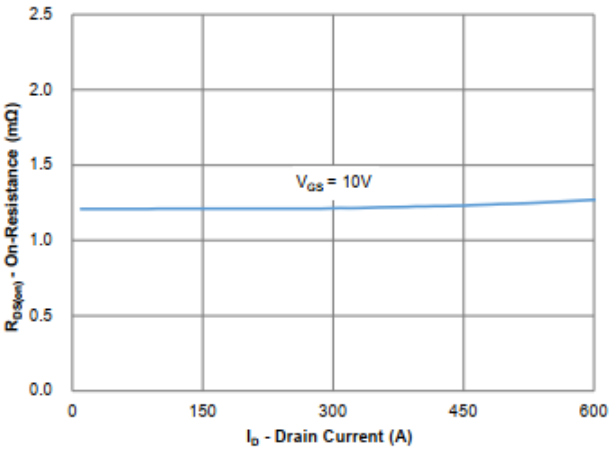


Figure 4. On-Resistance vs. Gate-Source Voltage

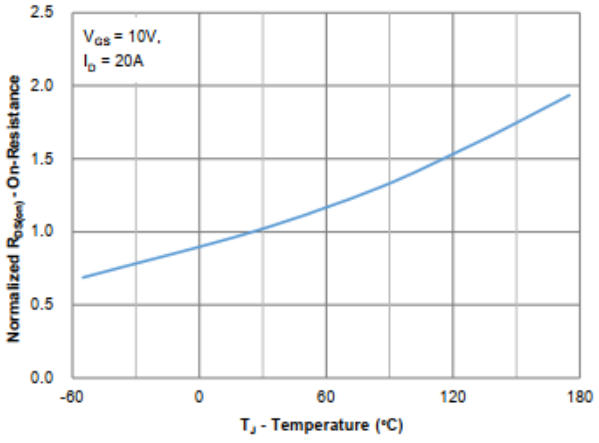


Figure 5. On-Resistance vs. Junction Temperature

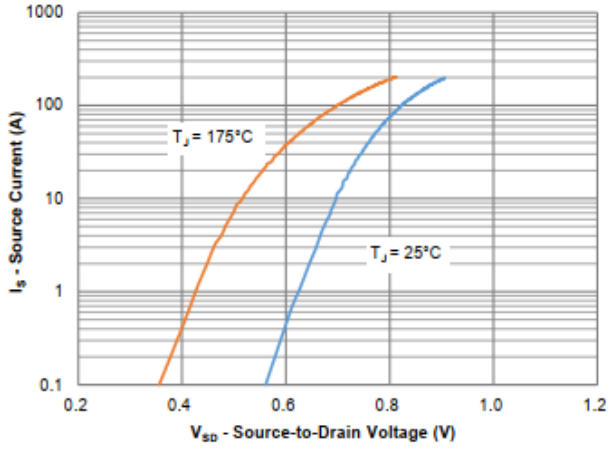


Figure 6. Source-Drain Diode Forward Voltage

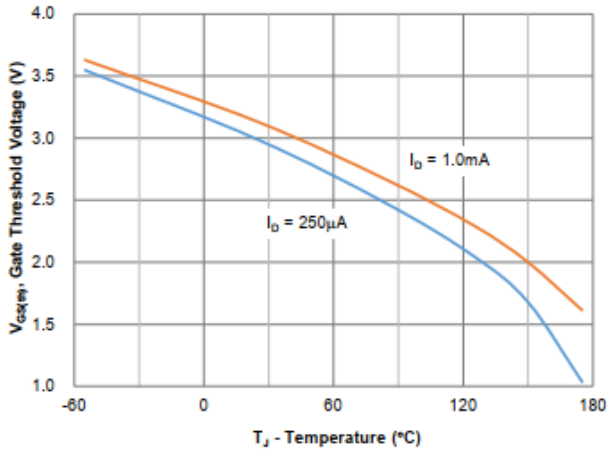


Figure 7. Gate Threshold Variation vs. Junction Temperature

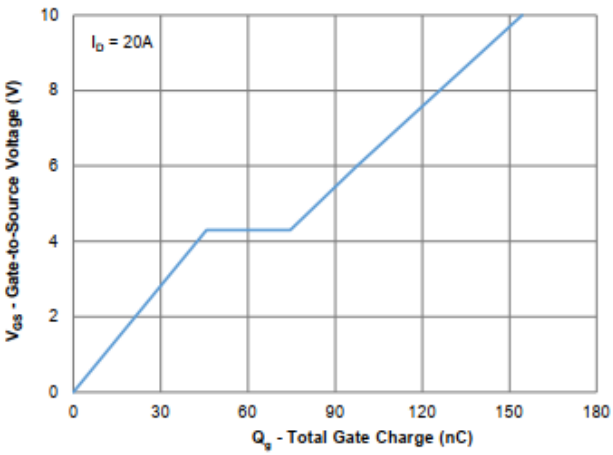


Figure 8. Gate Charge Characteristics

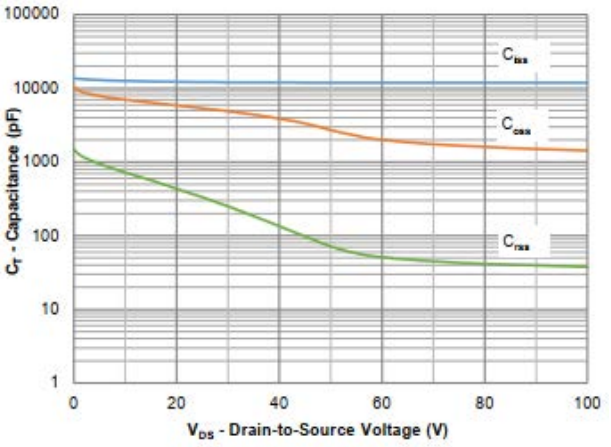


Figure 9. Capacitance Characteristics

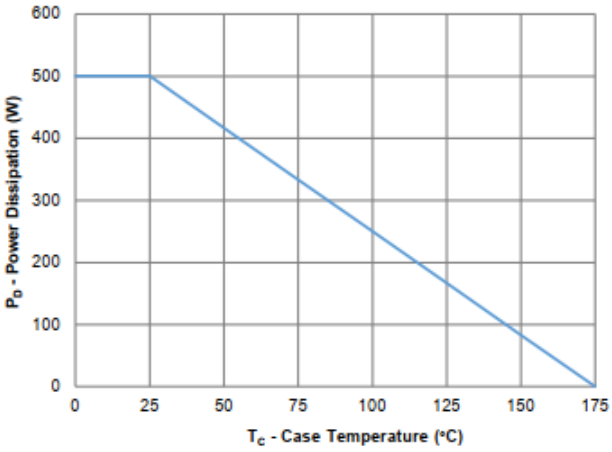


Figure 10. Power Derating

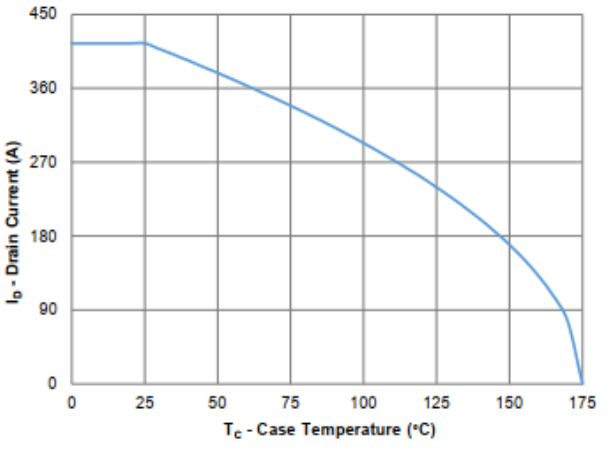


Figure 11. Current Derating

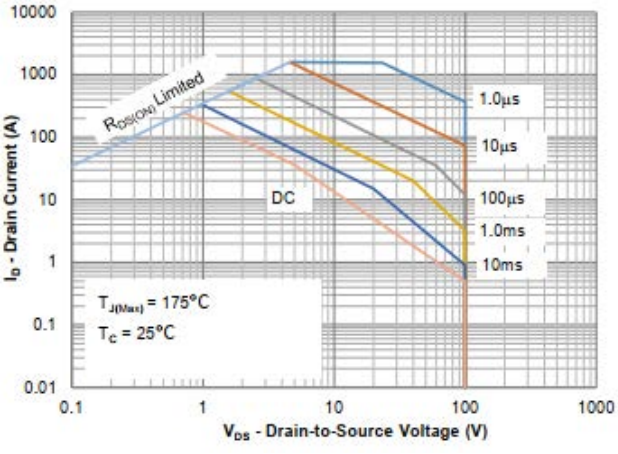


Figure 12. Safe Operating Area

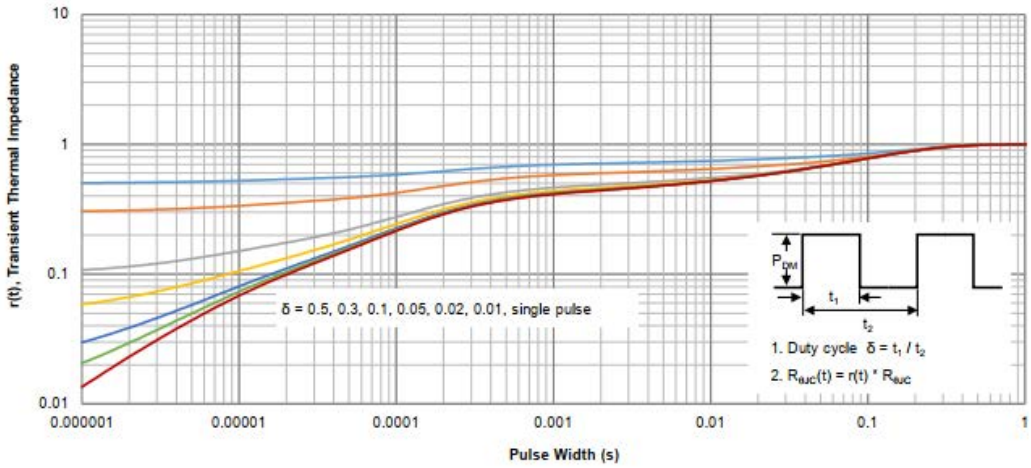
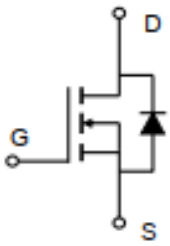
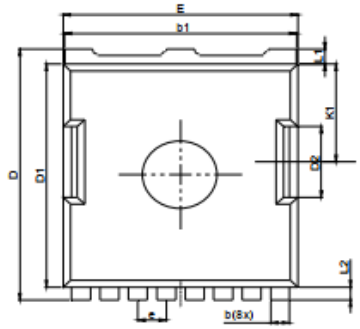


Figure 13. Max. Normalized Maximum Transient Thermal Impedance

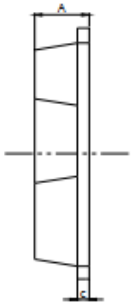
- Circuit diagram



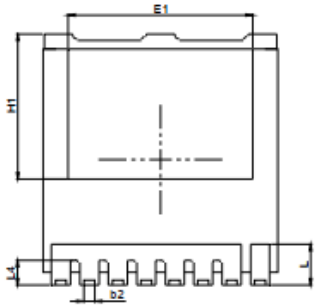
- TOLL Package outlines : Dimensions in (mm)



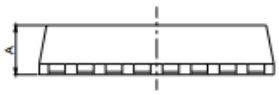
Top View



Side View



Bottom View



Front View

NOTES:

1. DIMENSION AND TOLERANCE PER ASME Y14.5M, 1994.
2. ALL DIMENSIONS IN MILLIMETER.
3. DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH. MOLD FLASH OR BURRS DOES NOT EXCEED 0.15MM.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.20	2.30	2.40
b	0.65	0.80	0.90
b1	9.65	9.80	9.95
c	0.40	0.50	0.60
D	11.48	11.68	11.95
D1	10.25	--	10.70
D2	2.85	--	3.40
E	9.70	9.90	10.10
E1	8.00	--	9.25
e	1.20 (BSC)		
H1	6.70	7.00	7.30
K1	4.55		
L	1.35	--	2.10
L1	0.70		
L2	0.60		
L4	0.95	1.20	1.35

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