100V N-Channel Power MOSFET

DESCRIPTION：
- High Speed Power Switching
- Enhanced Body diode dv/dt capability
- Enhanced Avalanche Ruggedness
- 100% UIS Tested, 100% Rg Tested
- RoHS compliant
- Halogen Free

V_{DS}	100V
I_D(Tc = 25°C)	290A
$R_{DS(on)}$ @ V_{GS}=10V (Max)	2mΩ

TOLL

TYPICAL APPLICATIONS：
- DC/DC in Telecoms and Industrial
- Power management
- Portable Equipment

MAXIMUM RATINGS (at T_J = 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	290 160	A
Maximum power dissipation	Tc=25℃	P_D	312	W
Single Pulse Avalanche Current	0.5mH	E_{AS}	1225	mJ
Operation Junction temperature		Tjmax	150	℃
Storage temperature		T_{STG}	-55~+150	℃

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance, junction - Ambient		$R_{\theta(j-A)}$	60	℃/W

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	BV_{DSS}	100			V
Zero Gate Voltage Drain Current VDS = 100 V, VGS = 0 V Tj=25℃ VDS = 100 V, VGS = 0 V Tj=100℃	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	$V_{GS(th)}$	2.8		4.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 50A	$R_{DS(on)}$			2	mΩ
Snput capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{iss}		6554		pF
Output capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{oss}		4855		pF
Reverse transfer capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{rss}		309		pF
Total Gate Charge VDS= 50V, ID= 20A,VGS= 10V	Q_G		122		nC
Gate to Source Charge VDS= 50V, ID= 20A,VGS= 10V	Q_{GS}		37		nC
Gate to Drain Charge VDS= 50V, ID= 20A,VGS= 10V	Q_{GD}		27		nC
Turn-on delay time VDS=50 V, ID=20A, VGS= 10V, RG=5Ω	$td_{(ON)}$		25		ns
Rise time VDS=50 V, ID=20A, VGS= 10V, RG=5Ω	tr		33		ns
Turn-off delay time VDS=50 V, ID=20A, VGS= 10V, RG=5Ω	$td_{(OFF)}$		95		ns
Fall time VDS=50 V, ID=20A, VGS= 10V, RG=5Ω	tf		75		ns

Body Diode

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Forward Voltage VGS = 0V, IF = 50A Tj=25℃	V_{SD}		0.7	1.2	V
Revers Recovery Time IF=20A, VGS= 0V, dIF/dt = 100A/us□Tj=25℃	Trr		95		ns
Revers Recovery Charge IF=20A, VGS= 0V, dIF/dt = 100A/us□Tj=25℃	Qrr		300		nC

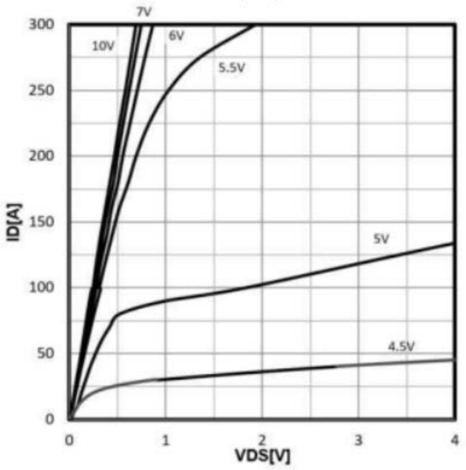


Figure 1. Typical output characteristics (Tj=25℃)

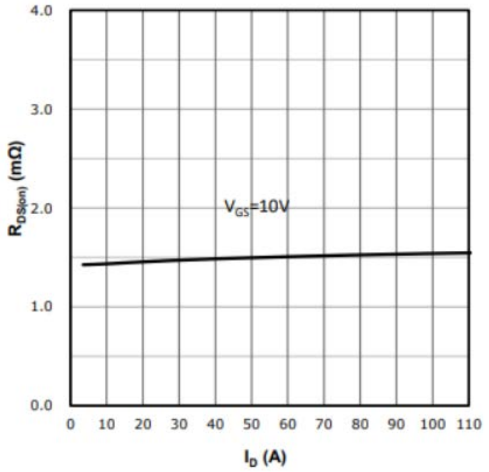


Figure 2. Typical Drain On-Resistance

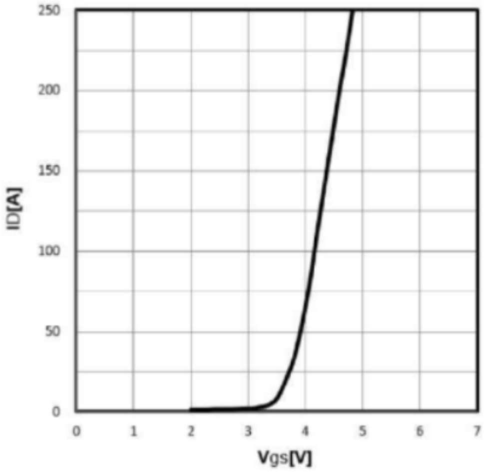


Figure 3. Typical Transfer Characteristics

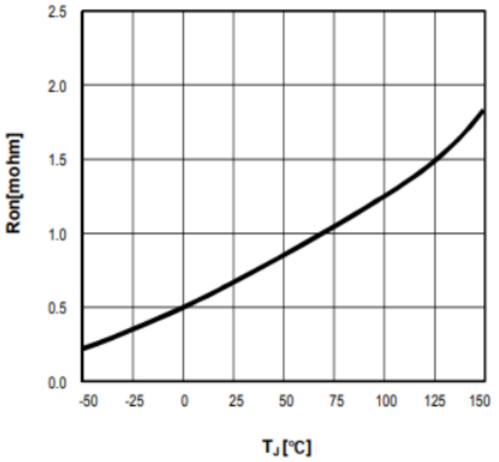


Figure 4. Drain-Source On-State Resistance
ID=50A , VGS=10V

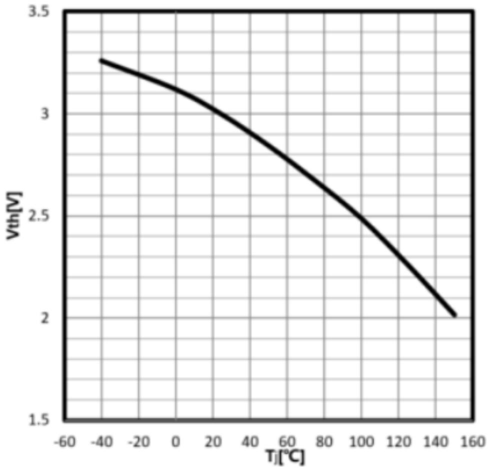


Figure 5. Gate Threshold Voltage
ID=250uA

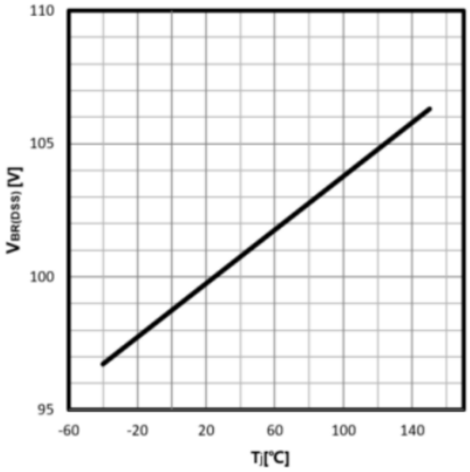


Figure 6. Drain-Source Breakdown Voltage
ID=250uA

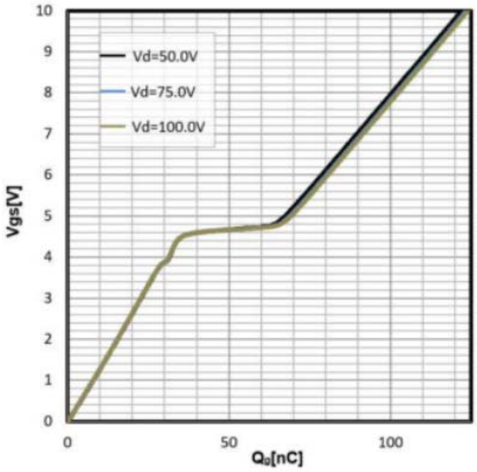


Figure 7. Typical Gate Charge
ID=20A

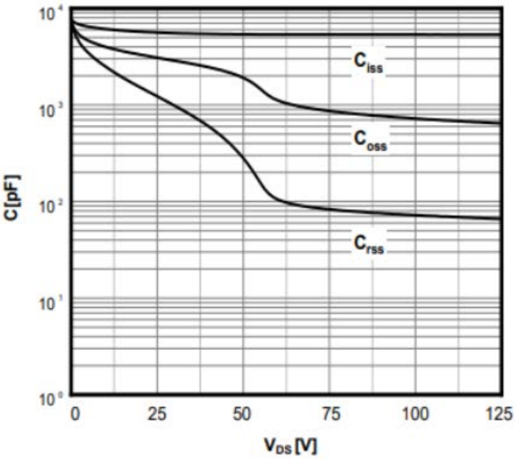


Figure 8.Typical Capacitances
VGS=0V, f=1MHz

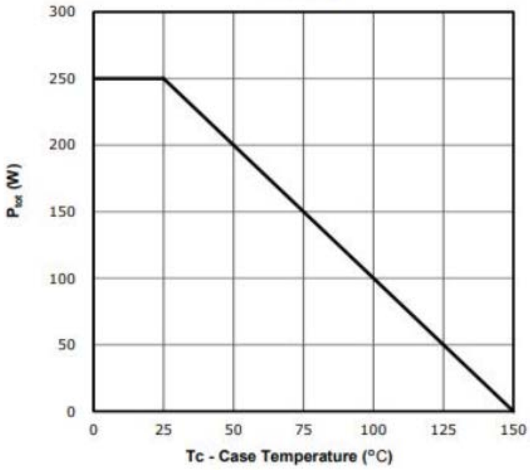


Figure 9. Power Dissipation

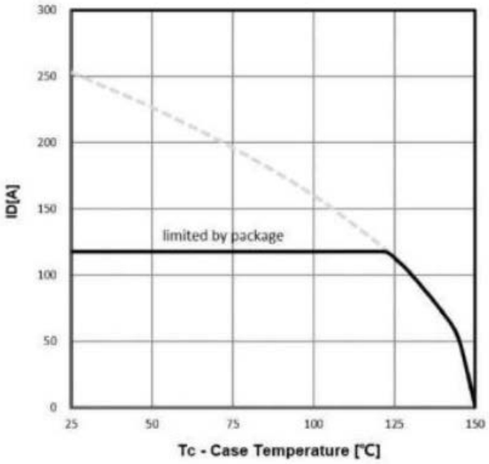


Figure 10. Max. Drain Current

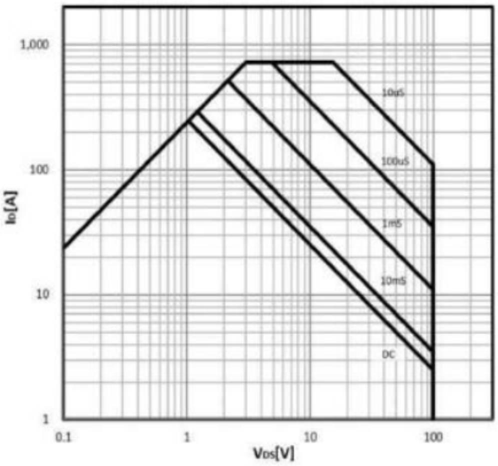


Figure 11. Safe Operating Area

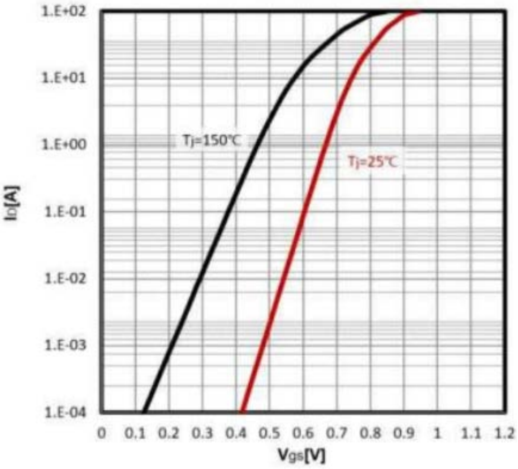


Figure 12. Body Diode Forward voltage variation

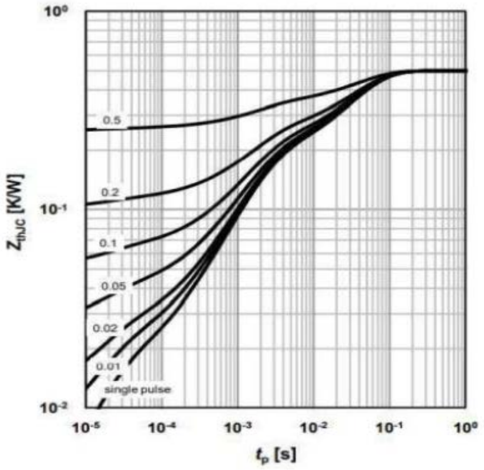
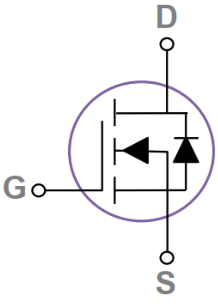
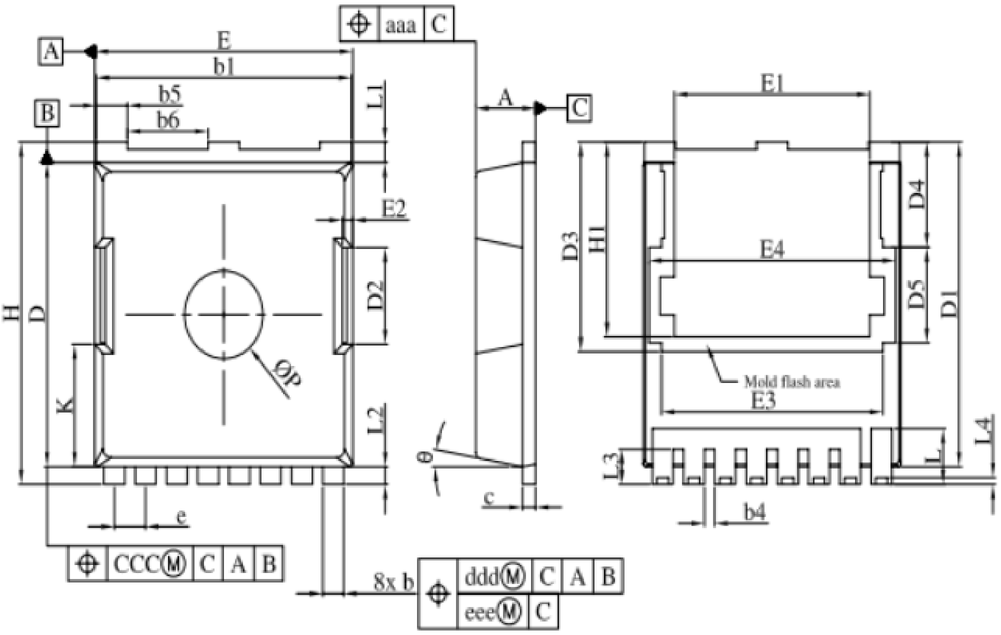


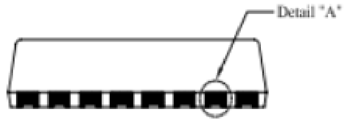
Figure 13. Max. Transient Thermal Impedence

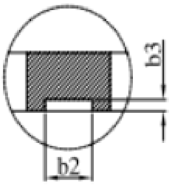
- Circuit diagram



- TOLL Package outlines : Dimensions in (mm)







SYMBOL	COMMON		
	MILLIMETER		
	MIN.	NOMINAL	MAX.
A	2.20	2.30	2.40
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
b2	0.36	0.45	0.55
b3	0.05	0.100	/
b4	0.30	0.40	0.50
b5	1.10	1.20	1.30
b6	3.00	3.10	3.20
c	0.40	0.50	0.60
D	10.28	10.38	10.55
D1	10.98	11.08	11.18
D2	3.20	3.30	3.40
D3	7.15		
D4	3.59		
D5	3.26		
e	1.10	1.20	1.30
E	9.80	9.90	10.00
E1	7.40	7.50	7.60
E2	0.30	0.40	0.50
E3	8.50		
E4	9.46		
H	11.50	11.68	11.85
H1	6.55	6.65	6.75
K	4.08	4.18	4.28
L	1.60	1.90	2.10
L1	0.50	0.70	0.90
L2	0.50	0.60	0.70
L3	1.00	1.20	1.30
L4	0.13	0.23	0.33
P	2.85	3.00	3.15
θ	10° REF		
aaa	0.20		
ccc	0.20		
ddd	0.25		
eee	0.20		

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