MOSPEC

411N100D

40V N-Channel Enhancement Mode MOSFET

DESCRIPTION：

·Fast switching speed

·Reliable and Rugged

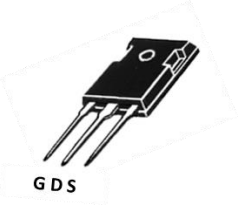
·ROHS Compliant & Halogen-Free

·100% UIS and Rg Tested

V_{DSS}	100V
I_D	411A
$R_{DS(ON)_MAX}$ @V_{GS}=10V	1.68mΩ

TYPICAL APPLICATIONS：

·Battery Management System



TO-247

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
Diode Continuous Forward Current		I_S	258	A
Pulsed Drain Current (1)		I_{DM}	1028	A
Continuous Drain Current	Tc=25℃ Tc=100℃ Ta=25℃ Ta=70℃	I_D	411 260 43 35	A
Power dissipation	Tc=25℃ Tc=100℃ Ta=25℃ Ta=70℃	P_D	284 114 3.1 2.0	W
Single Pulse Avalanche Current (2)	L= 0.1mH L= 0.5mH	I_{AS}	105 72	A
Single Pulsed Avalanche Energy (3)	L= 0.1mH L= 0.5mH	E_{AS}	550 1300	mJ
Maximum Junction Temperature		T_J	150	℃
Storage temperature Range		T_J, T_{STG}	-55~+150	℃

Notes： 1. Max. current is limited by junction temperature.

2. UIS tested and pulse width are limited by maximum junction temperature 150°C.

3. Surface Mounted on 1in2 FR-4 board with 1oz.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	40 0.44	℃/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 = 80 V, VGS = 0 V	I_{DSS}			1	uA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	2	3	4	V
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Drain-Source On-State Resistance VGS = 10V, ID = 100A	$R_{DS(on)}$		1.4	1.68	mΩ
Forward Transconductance VDS = 5.0V, ID = 10A	gfs		4		S
Gate Resistance f=1MHz	Rg		1		Ω
Input capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{iss}		18320		pF
Output capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{oss}		6095		pF
Reverse transfer capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{rss}		556		pF
Turn-on delay time VDS=50 V, ID=1A, VGS=10V, R_{GEN}=1Ω	td (ON)		70.8		ns
Rise time VDS=50 V, ID=1A, VGS=10V, R_{GEN}=1Ω	tr		37.9		ns
Turn-off delay time VDS=50 V, ID=1A, VGS=10V, R_{GEN}=1Ω	td (OFF)		162.1		ns
Fall time VDS=50 V, ID=1A, VGS=10V, R_{GEN}=1Ω	tf		358.3		ns
Total Gate Charge VDS= 50V, ID= 100A, VGS= 6V VDS= 50V, ID= 100A, VGS= 10V	Q_G		205 313		nC
Gate to Source Charge VDS= 50V, ID= 100A, VGS= 10V	Q_{GS}		97.8		nC
Gate to Drain Charge VDS= 50V, ID= 100A, VGS= 10V	Q_{GD}		83.7		nC
Diode Forward Voltage VGS = 0V, I_{SD} =10A	V_{SD}		0.75	1.1	V
Revers Recovery Time I_F =50A, VR=50V ,di_F/dt = 100A/us	Trr		147		ns
Revers Recovery Charge I_F =50A, VR=50V ,di_F/dt = 100A/us	Qrr		419		uC

Typical Performance Characteristics

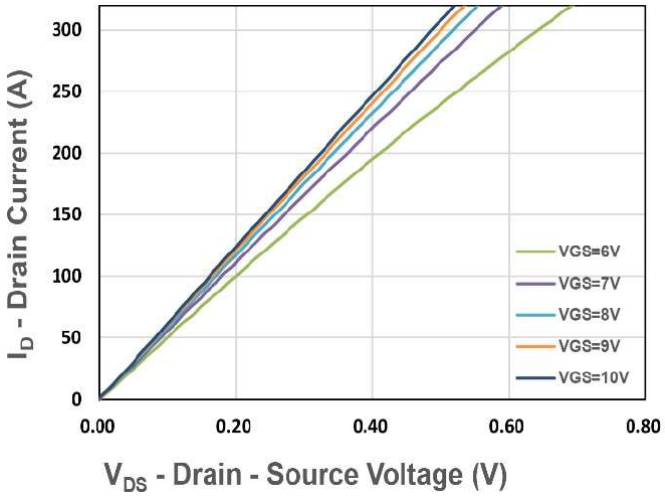


Figure 1. Output Characteristics

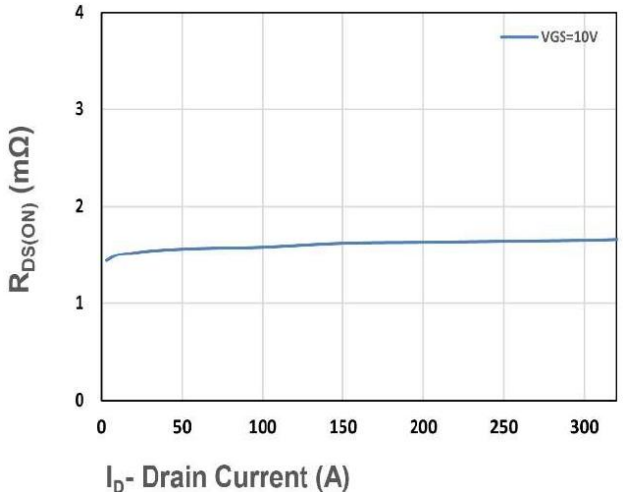


Figure 2. On-Resistance vs. ID

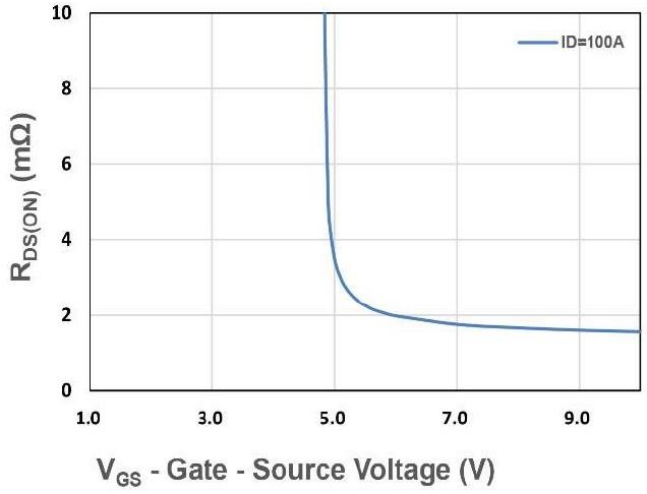


Figure 3. On-Resistance vs. VGS

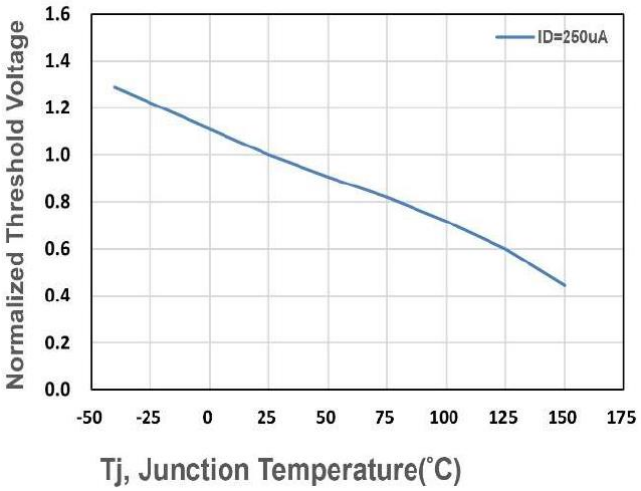


Figure 4. Gate Threshold Voltage

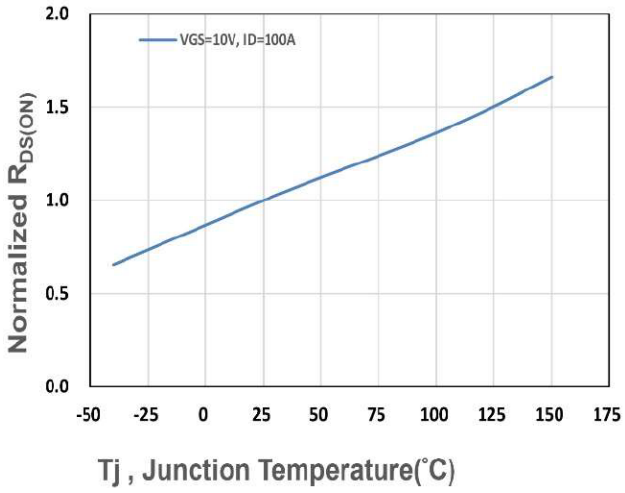


Figure 5. Drain-Source On Resistance

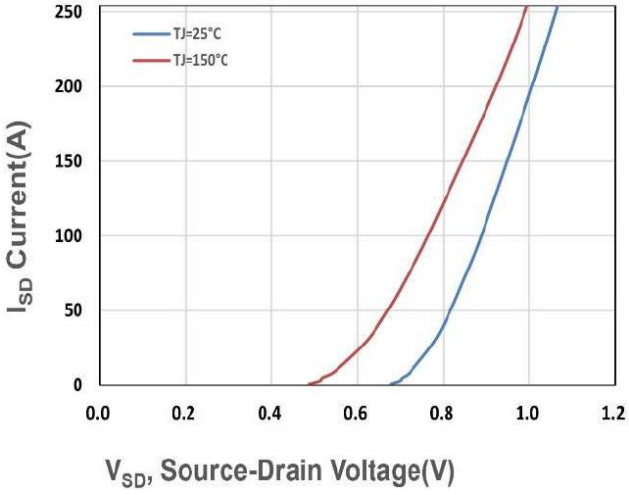


Figure 6. Source-Drain Diode Forward

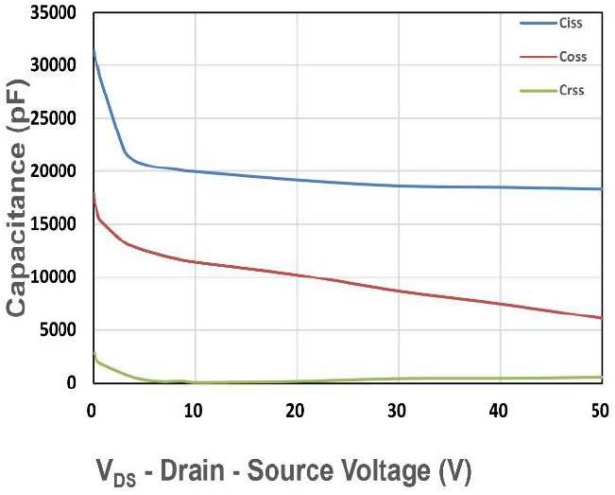


Figure 7. Capacitance

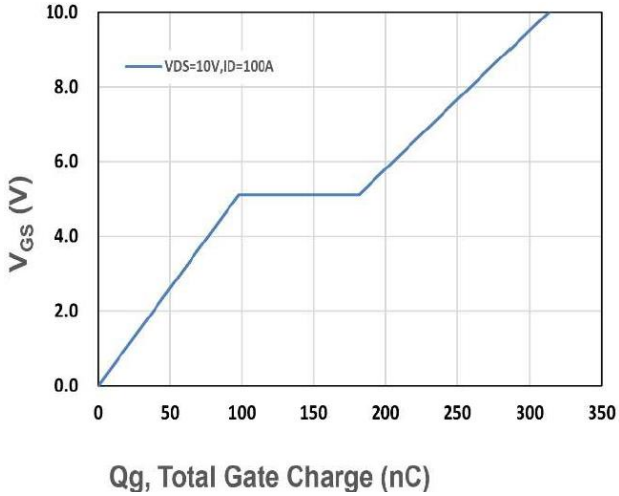


Figure8. Gate Charge Characteristics

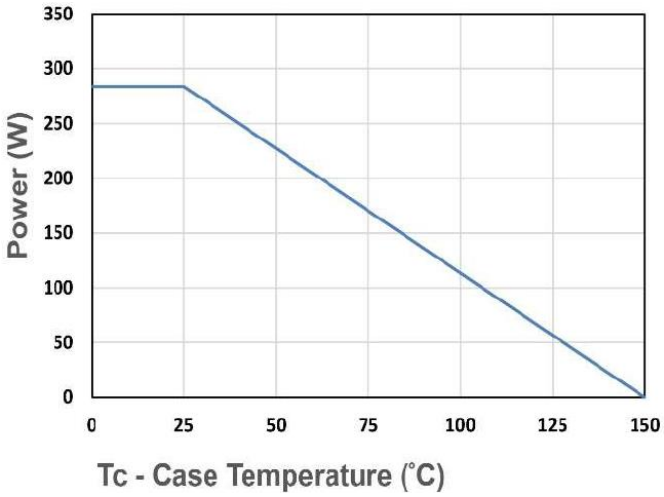


Figure 9. Power Dissipation

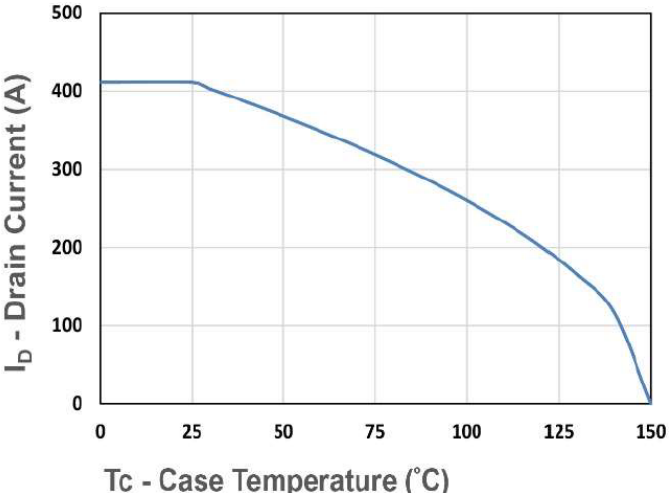


Figure 10. Drain Current

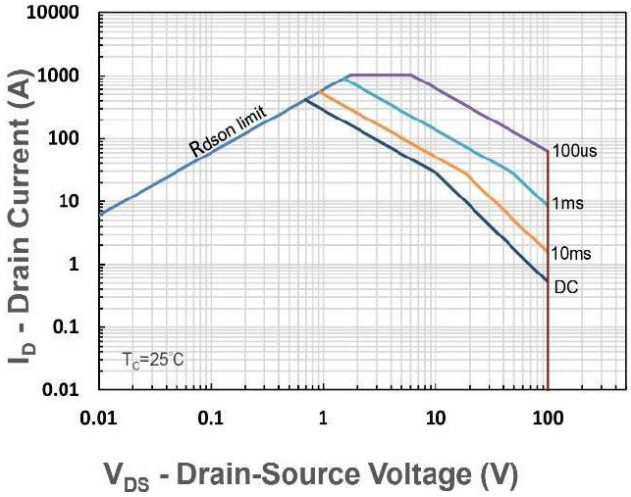


Figure 11. Safe Operating Area

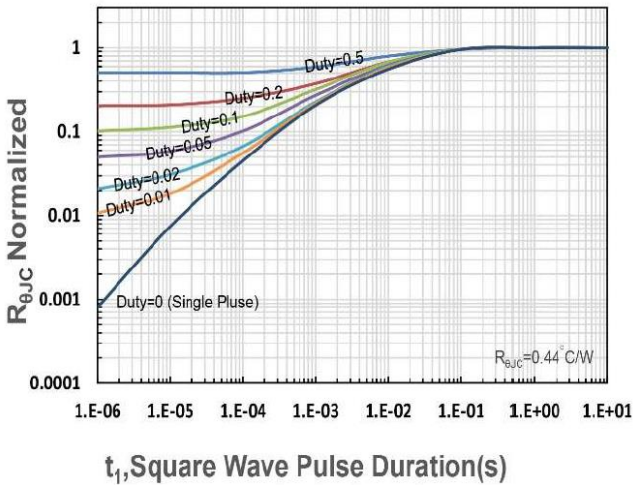
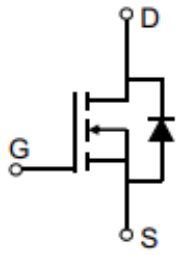
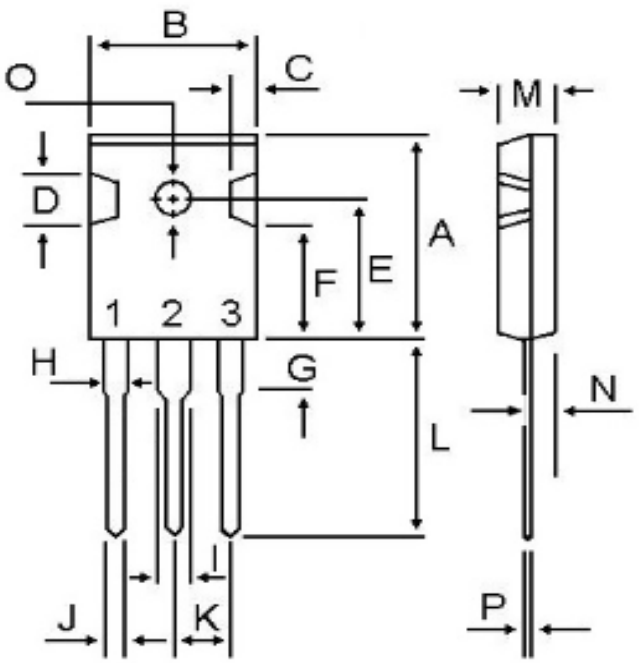


Figure 12. $R_{\theta JC}$ Transient Thermal Impedance

·Circuit diagram



·Package outlines : Dimensions in (mm)



DIM	MILLIMETERS	
	MIN	MAX
A	20.80	21.80
B	15.38	16.20
C	1.90	2.70
D	4.90	6.10
E	14.50	15.50
F	11.20	13.20
G	3.75	4.35
H	1.90	2.30
I	2.90	3.30
J	1.00	1.40
K	5.26	5.66
L	19.50	20.50
M	4.68	5.36
N	2.30	2.60
O	3.45	3.85
P	0.48	0.72

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