MOSPEC

1Z9N100S

100V N-Channel Power MOSFET

DESCRIPTION：

·Excellent $R_{DS(ON)}$

·Low Gate Charge

·Pb-Free Lead Plating

·RoHS compliant

·Halogen Free

V_{DSS}	100V
I_D @V_{GS}=10V	1.9A
$R_{DS(ON)\_Typ.}$ @V_{GS}=10V	105mΩ

TYPICAL APPLICATIONS：

·Load Switch

·PWM Application

·Power Management

SOT-23

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	1.9 1.2	A
Pulsed Drain Current (1)		I_{DM}	Refer to Fig.4	A
Single Pulsed Avalanche Energy (2)		E_{AS}	6.6	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	0.9 0.4	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	℃

Notes： 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. EAS condition: Starting TJ=25C, VDD=50V, VGS=10V, RG=25ohm, L=3mH, IAS=2.1A, VDD=0V during time in avalanche.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient	$R_{\theta JA}$	137	℃/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	$V_{(BR)DSS}$	100			V
Zero Gate Voltage Drain Current VDS = 80 V, VGS = 0 V,	I_{DSS}			1.0	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	1.3	1.9	2.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 2A VGS = 4.5V, ID = 1A	$R_{DS(on)}$		105 136	136 177	mΩ
Gate Resistance f=1MHz	R_g		1.1		Ω
Input capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{iss}		137	205	pF
Output capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{oss}		51	76	pF
Reverse transfer capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{rss}		4.0		pF
Total Gate Charge VDS= 50V, ID= 2A, VGS=0 to 10V	Q_G		3.2		nC
Gate to Source Charge VDS= 50V, ID= 2A, VGS=0 to 10V	Q_{GS}		0.8		nC
Gate to Drain Charge VDS= 50V, ID= 2A, VGS=0 to 10V	Q_{GD}		0.6		nC
Turn-on delay time VDS= 50V, VGS= 10V, ID=2A, RGEN=3Ω	td (ON)		2.2		ns
Rise time VDS= 50V, VGS= 10V, ID=2A, RGEN=3Ω	tr		3.0		ns
Turn-off delay time VDS= 50V, VGS= 10V, ID=2A, RGEN=3Ω	td (OFF)		6.5		ns
Fall time VDS= 50V, VGS= 10V, ID=2A, RGEN=3Ω	tf		2.2		ns

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Maximum Continuous Body Diode Forward Current	I_S			1.9	A
Maximum Pulsed Body Diode Forward Current	I_{SM}			7.6	A
Body Diode Forward Voltage VGS = 0V, IS = 2A	V_{SD}			1.2	V
Revers Recovery Time IF=2A, di/dt = 100A/us	Trr	14	23	34	ns
Revers Recovery Charge IF=2A, di/dt = 100A/us	Qrr		11.5		nC

Typical Performance Characteristics

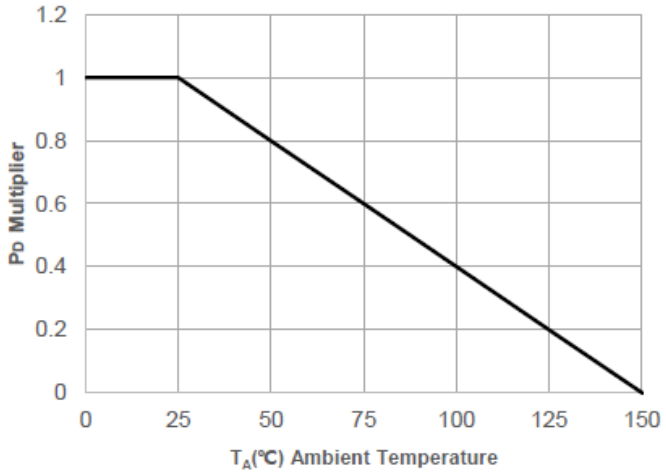


Figure 1. Power De-rating

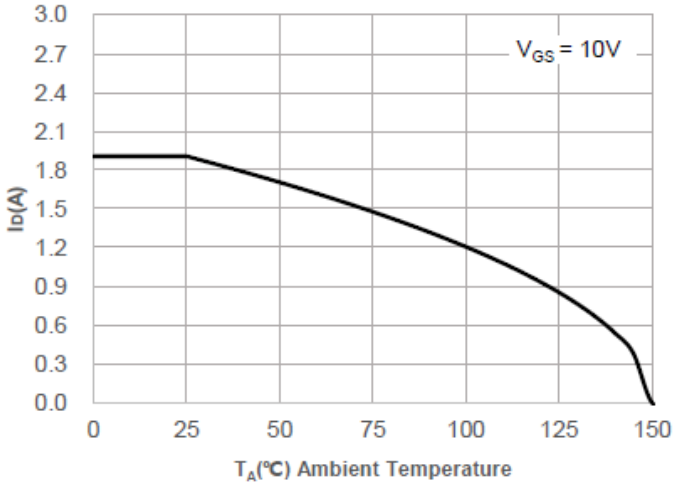


Figure 2. Current De-rating

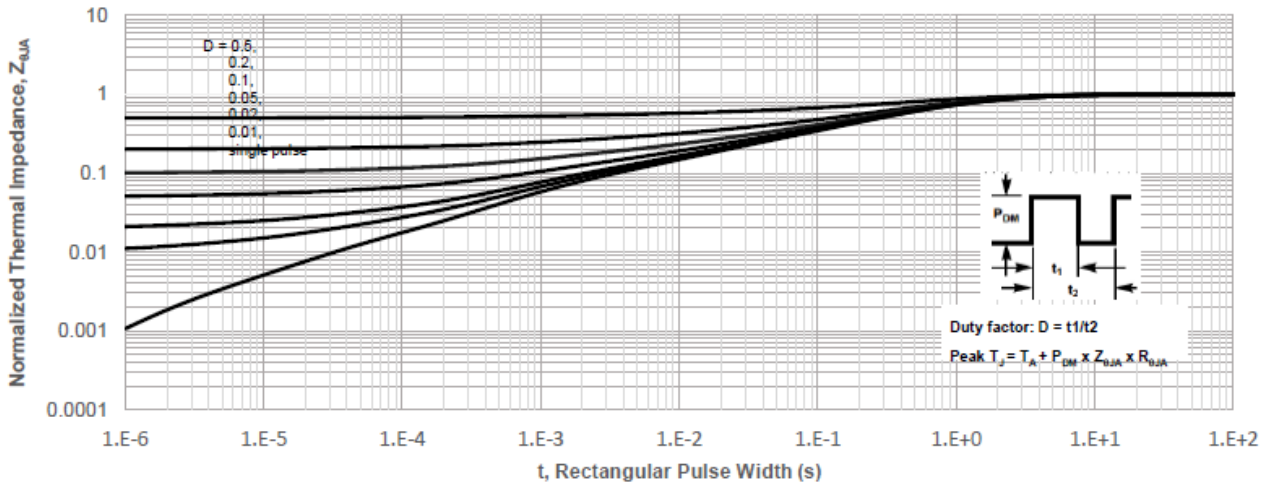


Figure 3. Normalized Maximum Transient Thermal Impedance

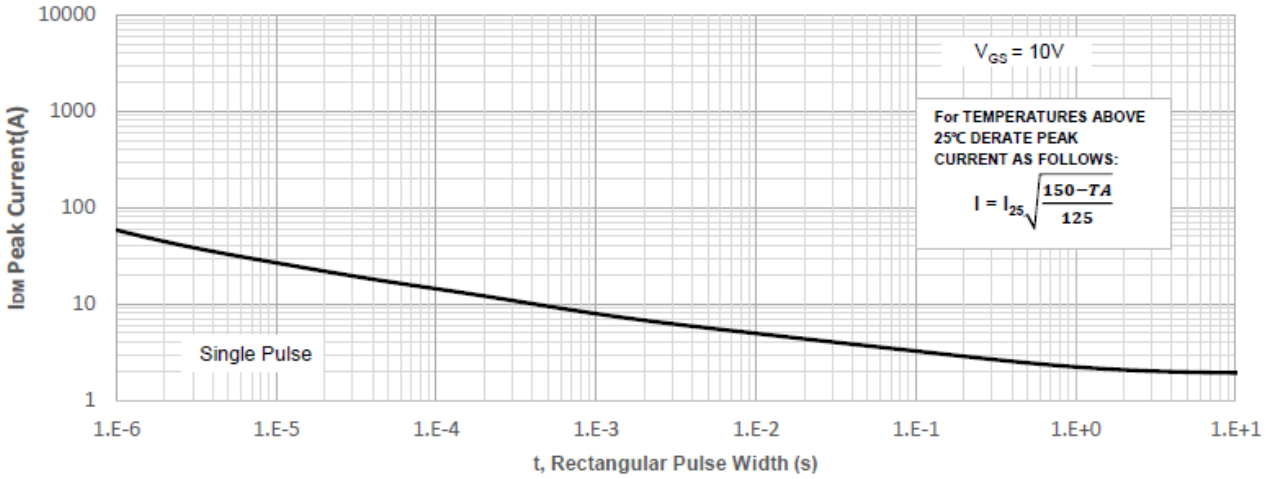


Figure 4. Peak Current Capacity

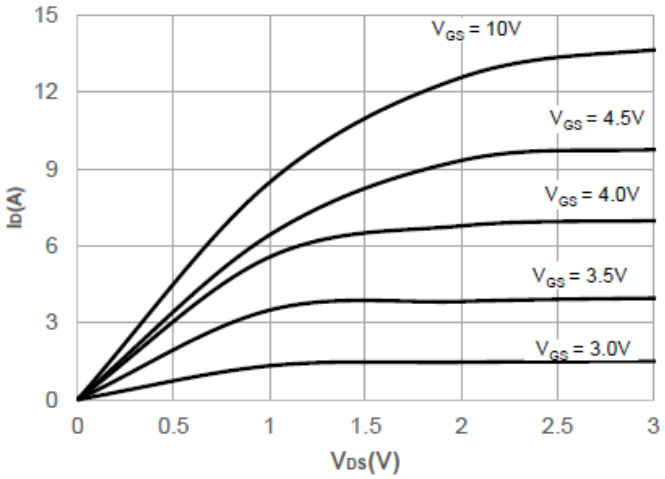


Figure 5. Output Characteristics

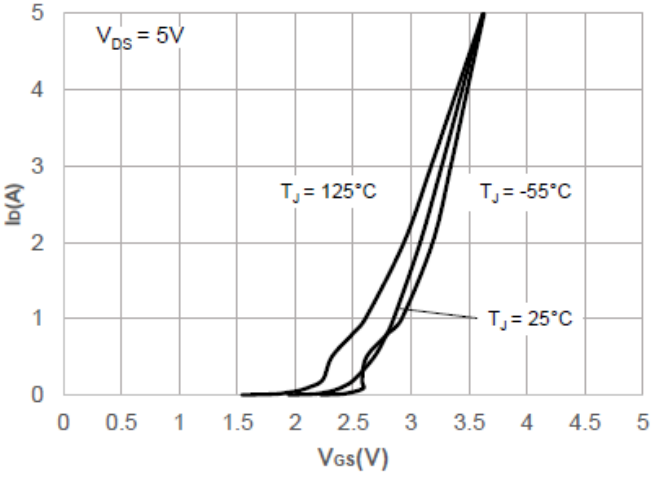


Figure 6. Typical Transfer Characteristics

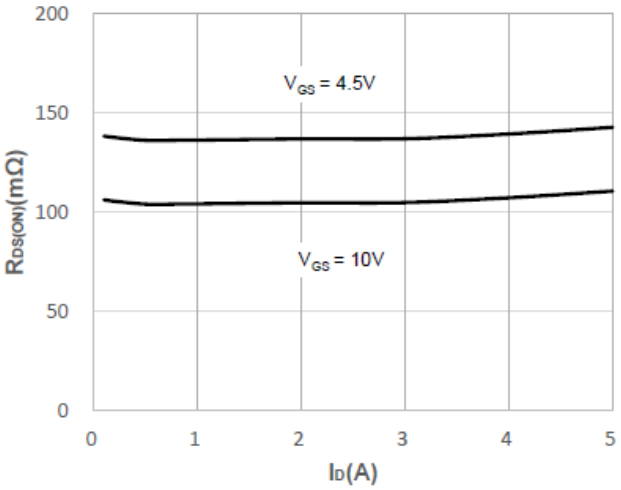


Figure 7. On-resistance vs. Drain Current

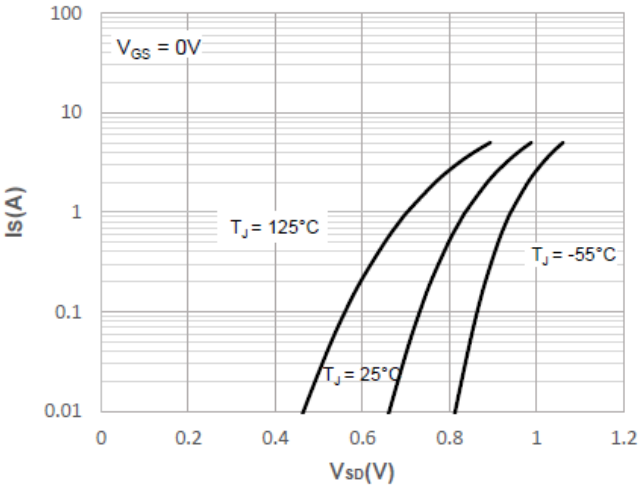


Figure 8. Body Diode Characteristics

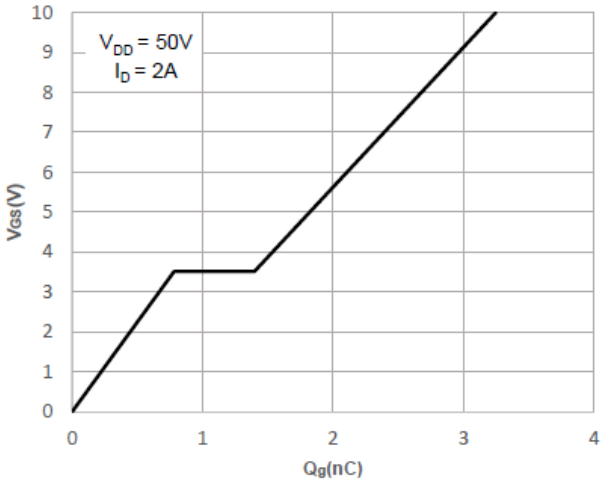


Figure 9. Gate Charge Characteristics

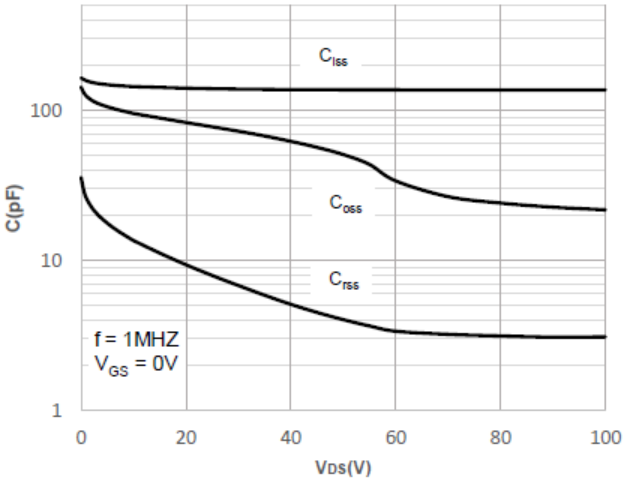


Figure 10. Capacitance Characteristics

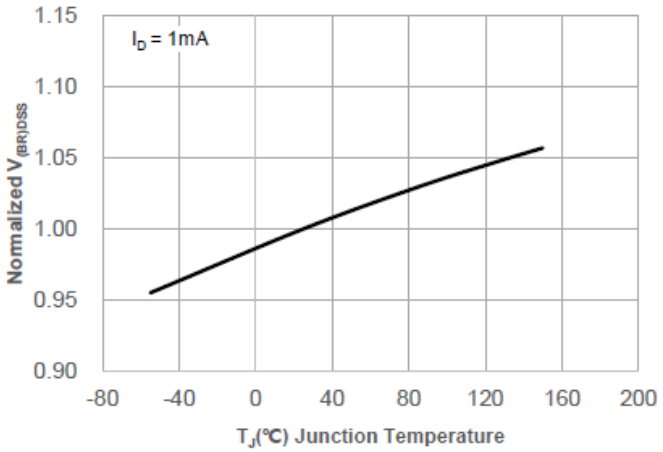


Figure 11. Normalized Breakdown voltage vs. Junction Temperature

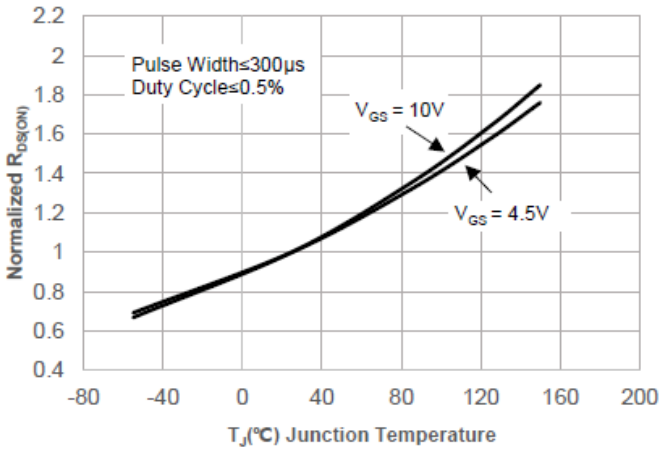


Figure 12. Normalized on Resistance vs. Junction Temperature

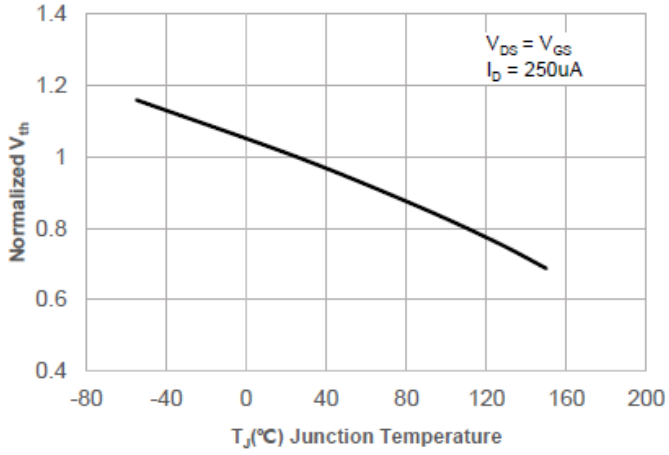


Figure 13. Normalized Threshold Voltage vs. Junction Temperature

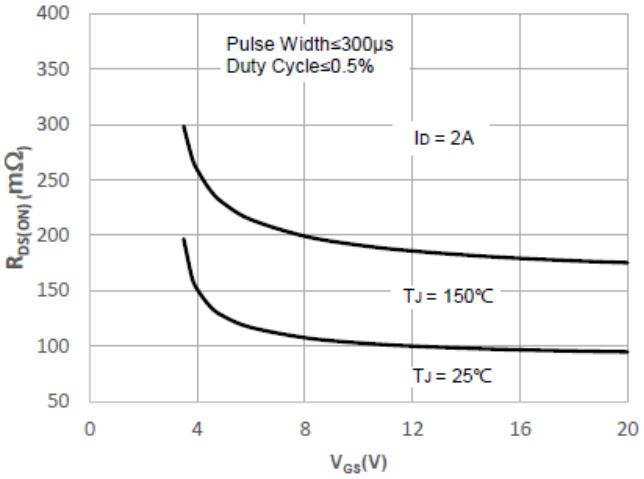


Figure 14. $R_{DS(ON)}$ vs. V_{GS}

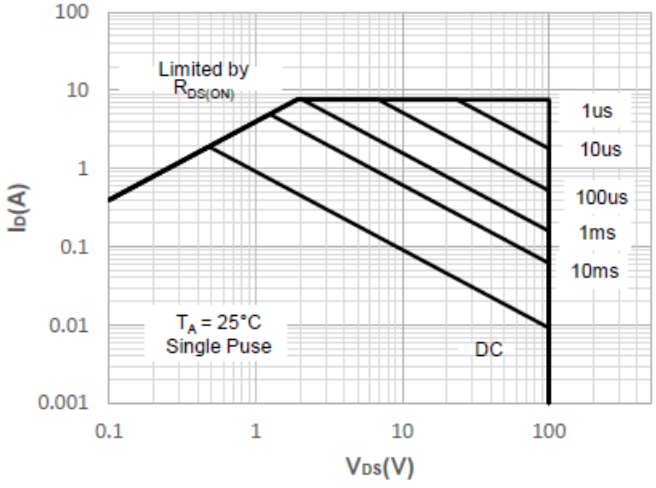
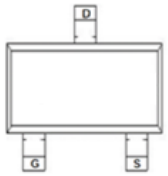
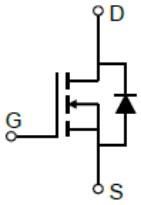


Figure 15. Maximum Safe Operating Area

·Circuit diagram

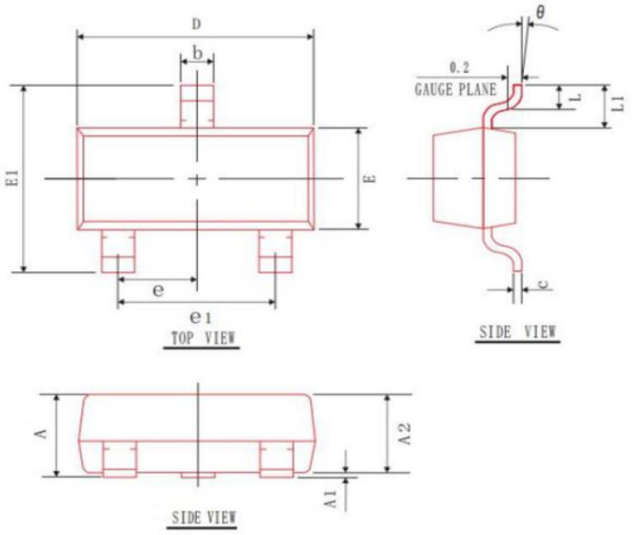


Pin Assignment



Schematic Diagram

·Package outlines : Dimensions in (mm)



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		

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