

100V N-Channel Power SpeedFET

• General Description

It combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

• Features

- AEC-Q101 Qualified
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

• Application

- BLDC Motor driver
- DC-DC
- Load Switch

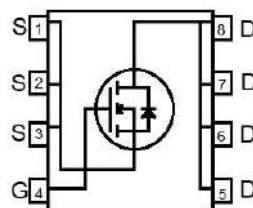
• Ordering Information:

Part NO.	KPRZMS100N10-V
Marking	ZMS100N10
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

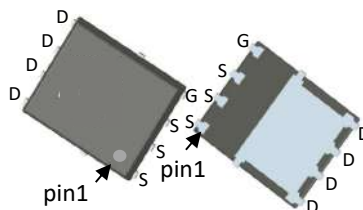
• Absolute Maximum Ratings ($T_C=25^\circ\text{C}$)

Parameter	Symbol	Conditions	Value	Unit
Drain-Source Voltage	V_{DS}		100	V
Gate-Source Voltage ^①	V_{GS}		± 20	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	50	A
	I_D	$T_C=75^\circ\text{C}$	45	A
	I_D	$T_C=100^\circ\text{C}$	39	A
Pulsed Drain Current	I_{DM}	Pulsed; $t_p \leq 10 \mu\text{s}$; $T_{mb} = 25^\circ\text{C}$;	200	A
Total Power Dissipation	P_D	$T_C=25^\circ\text{C}$	83	W
Total Power Dissipation	P_D	$T_A=25^\circ\text{C}$	3.3	W
Operating Junction Temperature	T_J		-55 to +175	$^\circ\text{C}$
Storage Temperature	T_{STG}		-55 to +175	$^\circ\text{C}$
Single Pulse Avalanche Energy	E_{AS}	$L=0.1\text{mH}$, $V_{GS}=10\text{V}$, $R_g=25\Omega$,	97	mJ
		$L=0.5\text{mH}$, $V_{GS}=10\text{V}$, $R_g=25\Omega$,	184	mJ
ESD Level (HBM)	CLASS 1C			

• Product Summary



$V_{DS} = 100\text{V}$
 $R_{DS(ON)} = 10\text{m}\Omega$
 $I_D = 50\text{A}$



DFN5*6



●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}		-	1.8	°C/W
Thermal resistance, junction-ambient	$R_{thJA}^{②}$		-	45	°C/W
Soldering temperature	Tsold		-	260	°C

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.4	1.7	2.5	V
Drain-Source Leakage Current	I_{DSS}	$V_{GS}=0V, V_{DS}=100V$			1.0	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$		10	13	m Ω
		$V_{GS}=4.5V, I_D=16A$		12.0	15	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_{SD}=10A$		15		S
Diode Forward Voltage	V_{FSD}	$V_{GS}=0V, I_{SD}=20A$			1.3	V

●Dynamic characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input capacitance	Ciss	f = 1MHz, $V_{DS}=25V$	-	1400	-	pF
Output capacitance	Coss		-	630	-	
Reverse transfer capacitance	Crss		-	33	-	
Gate Resistance	Rg	f = 1MHz	-	2		Ω
Total gate charge	Qg	$V_{DD}=15V,$ $I_D=20A,$ $V_{GS}=10V$	-	20	-	nC
Gate - Source charge	Qgs		-	3.6	-	
Gate - Drain charge	Qgd		-	2.8	-	
Turn-ON Delay time	$t_{D(on)}$	$V_{GS}=10V, V_{DS}=15V,$ $R_G=3.3\Omega, I_D=20A$	-	8	-	ns
Turn-ON Rise time	t_r		-	6	-	ns
Turn-Off Delay time	$t_{D(off)}$		-	40	-	ns
Turn-Off Fall time	t_f		-	36	-	ns
Reverse Recovery Time	t_{RR}	$V_{DD}=20V, di/dt =$ $100A/\mu s, I_S=50A$	-	52	-	ns
Reverse Recovery Charge	Q_{RR}		-	83	-	nC

Fig.1 Gate-Charge Characteristics

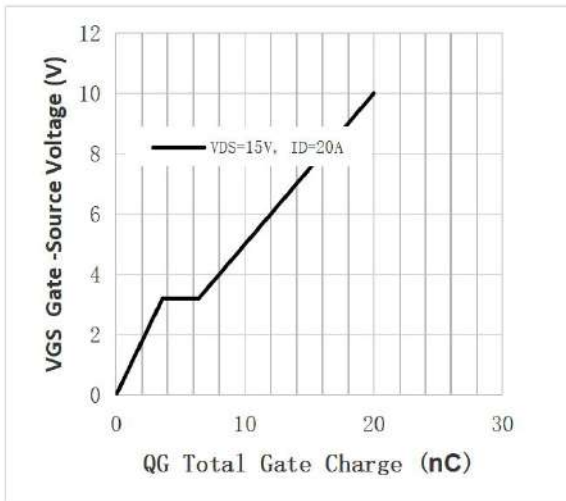


Fig.2 Capacitance Characteristics

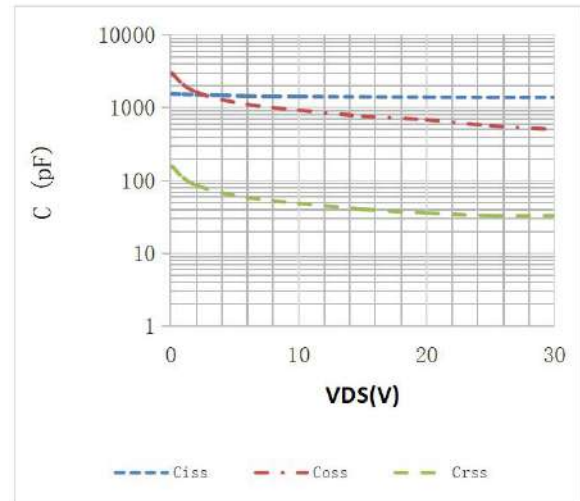


Fig.3 Power Dissipation

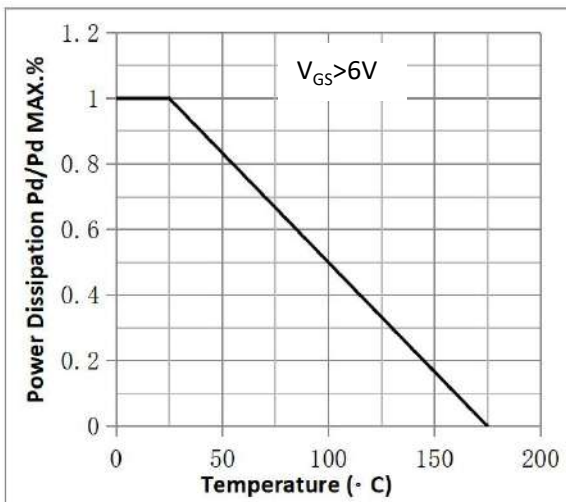


Fig.4 Typical output Characteristics

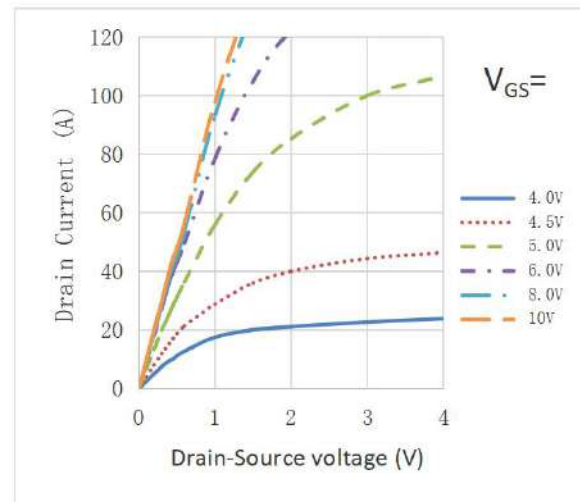


Fig.5 Threshold Voltage V.S Junction Temperature

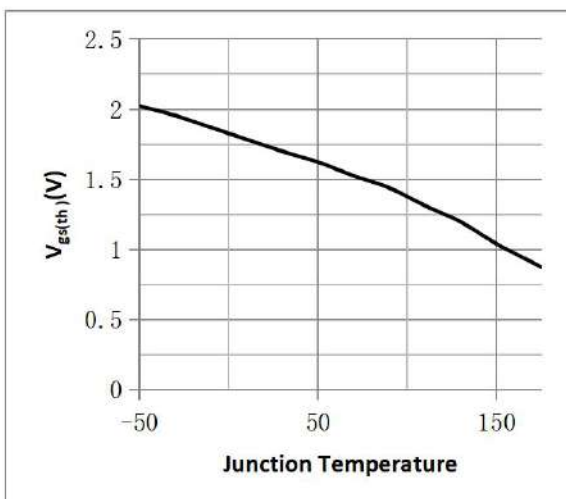


Fig.6 Resistance V.S Drain Current

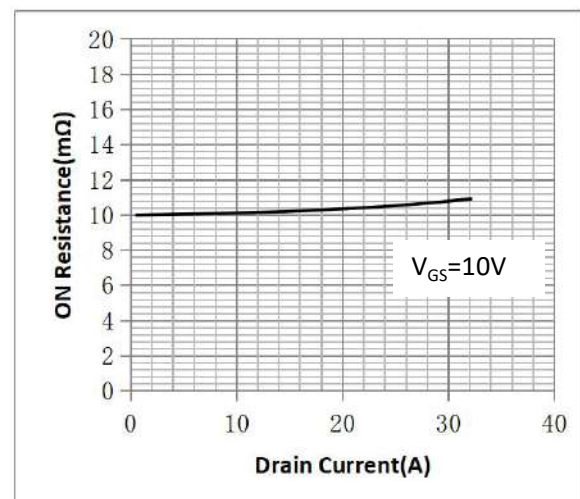


Fig.7 On-Resistance VS Gate Source Voltage

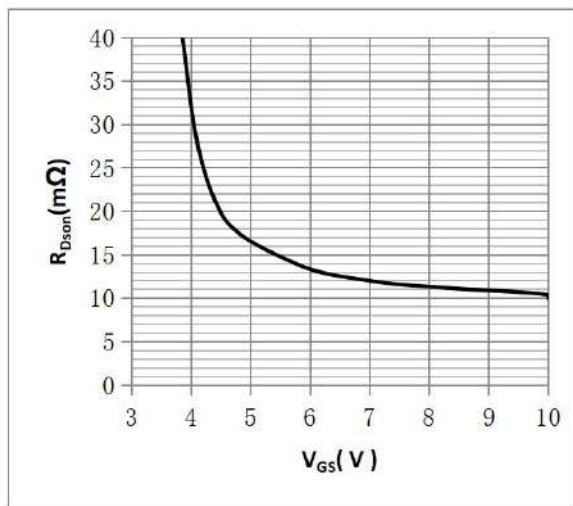


Fig.8 On-Resistance V.S Junction Temperature

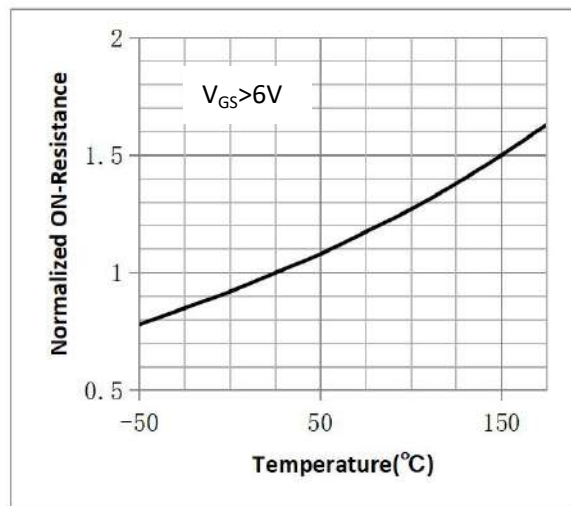


Figure 9. Diode Forward Voltage vs. Current

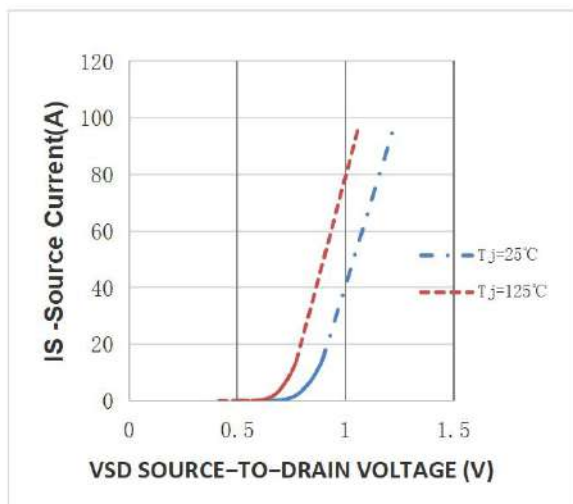


Figure 10. Transfer Characteristics

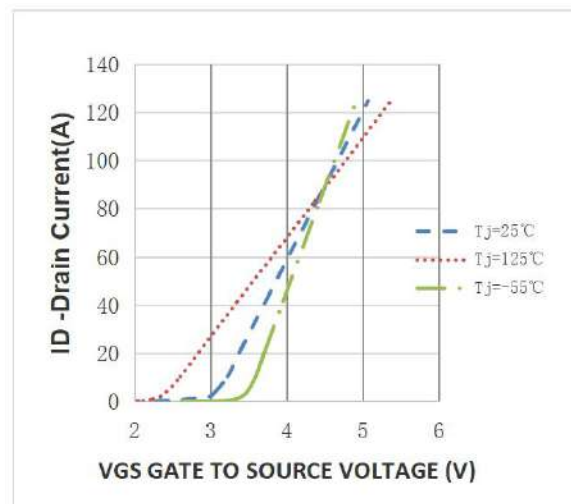


Fig.11 Safe Operating Area

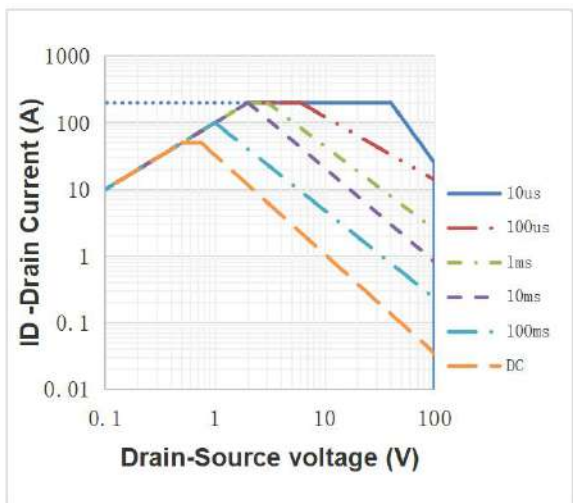
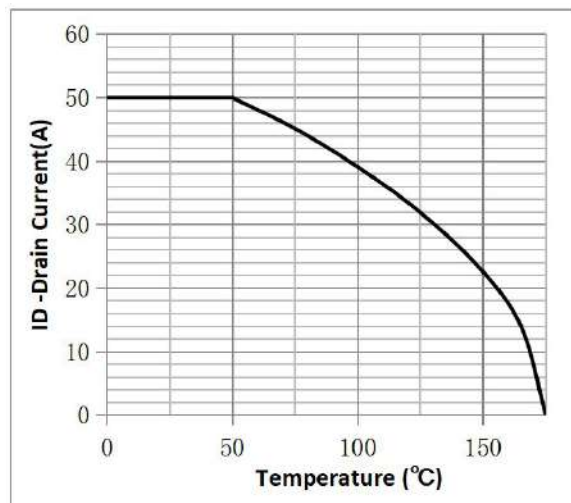
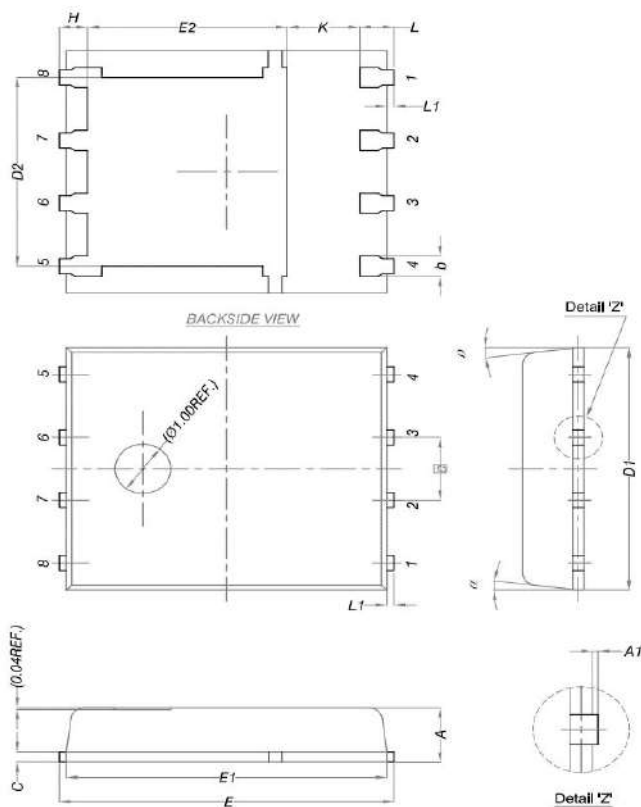


Fig.12 ID vs. Case Temperature^③



•DFN5*6 Package Outline



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0	-	0.05
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
e	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
α	0°	-	12°