

150V N-Channel Power SpeedFET

• General Description

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

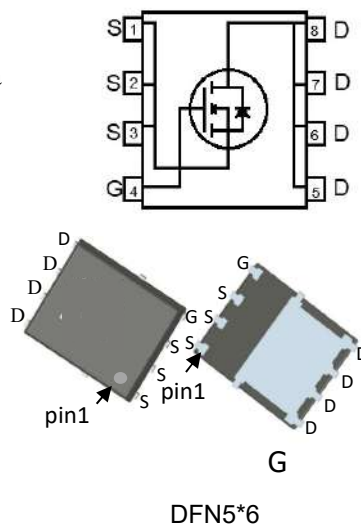
• Features

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

• Application

- DC-DC
- Load Switch

• Product Summary



$V_{DS} = 150V$
 $R_{DS(ON)} = 9.4m\Omega$
 $I_D = 75A$



• Ordering Information:

Part NO.	KPRZMS090N15H-V
Marking	ZMS090N15H
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

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

Parameter	Symbol	Conditions	Value	Unit
Drain-Source Voltage	V_{DS}	$25^\circ C \leq T_j \leq 175^\circ C$	150	V
Gate-Source Voltage	V_{GS}		± 20	V
Continuous Drain Current	I_D	$T_C=25^\circ C$	75	A
	I_D	$T_C=75^\circ C$	63	A
	I_D	$T_C=100^\circ C$	54	A
Pulsed Drain Current	I_{DM}	Pulsed; $t_p \leq 10 \mu s$; $T_{mb} = 25^\circ C$;	225	A
Total Power Dissipation	P_D	$T_C=25^\circ C$	136	W
Total Power Dissipation	P_D	$T_A=25^\circ C$	5.0	W
Operating Junction Temperature	T_J		-55 to +175	$^\circ C$
Storage Temperature	T_{STG}		-55 to +175	$^\circ C$
Single Pulse Avalanche Energy	E_{AS}	$L=0.1mH$, $V_{GS}=10V$, $R_g=25\Omega$,	252	mJ
		$L=0.5mH$, $V_{GS}=10V$, $R_g=25\Omega$,	403.2	mJ
ESD Level (HBM)	CLASS 2			

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	RthJC		-	1.1	°C/W
Thermal resistance, junction-ambient	RthJA①		-	30	°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 = 250uA	150			V
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250uA	2.0	2.7	4.0	V
Drain-Source Leakage Current	I _{DSS}	V _{GS} = 0V, V _{DS} = 150V			1.0	uA
Gate- Source Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			100	nA
Static Drain-source On Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 30A		9.4	11	mΩ
Forward Transconductance	g _{FS}	V _{GS} = 5V, I _{SD} = 10A		20		S
Diode Forward Voltage	V _{FSD}	V _{GS} = 0V, I _{SD} = 30A			1.3	V

●Dynamic characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input capacitance	Ciss	f = 1MHz, V _{DS} = 25V	-	3320	-	pF
Output capacitance	Coss		-	1204	-	
Reverse transfer capacitance	Crss		-	107	-	
Gate Resistance	Rg	f = 1MHz	-	1.2		Ω
Total gate charge	Qg	V _{DD} = 15V, I _D = 30A, V _{GS} = 10V	-	45	-	nC
Gate - Source charge	Qgs		-	16	-	
Gate - Drain charge	Qgd		-	9	-	
Turn-ON Delay time	t _{D(on)}	V _{GS} = 10V, V _{DS} = 15V, R _G = 3.3Ω, I _D = 20A	-	25	-	ns
Turn-ON Rise time	t _r		-	20	-	ns
Turn-Off Delay time	t _{D(off)}		-	36	-	ns
Turn-Off Fall time	t _f		-	13	-	ns
Reverse Recovery Time	t _{RR}	V _{DD} = 20V, dI _S /dt = 100A/us, I _S = 50A	-	76	-	ns
Reverse Recovery Charge	Q _{RR}		-	120	-	nC

Fig.1 Gate-Charge Characteristics

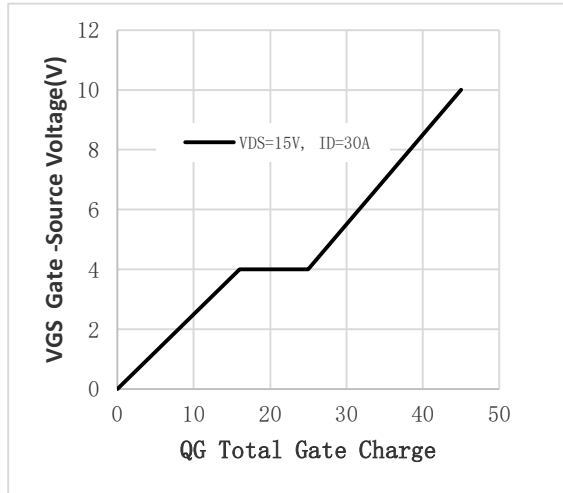


Fig.2 Capacitance Characteristics

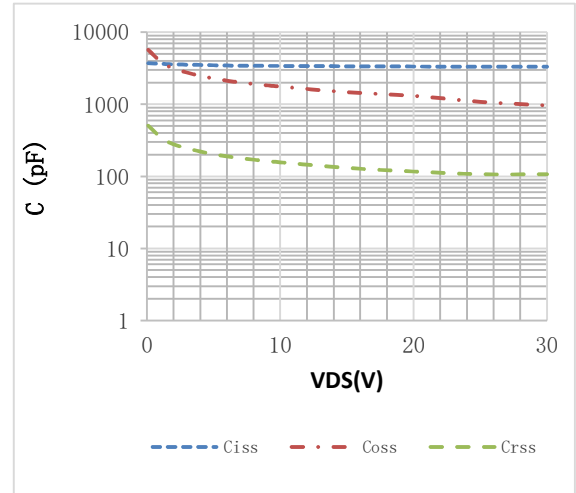


Fig.3 Power Dissipation

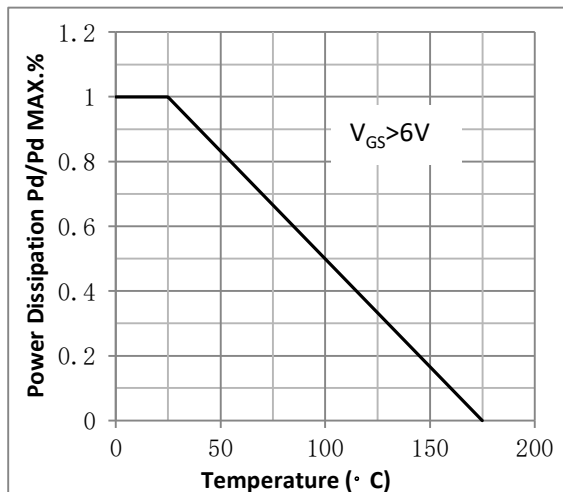


Fig.4 Typical output Characteristics

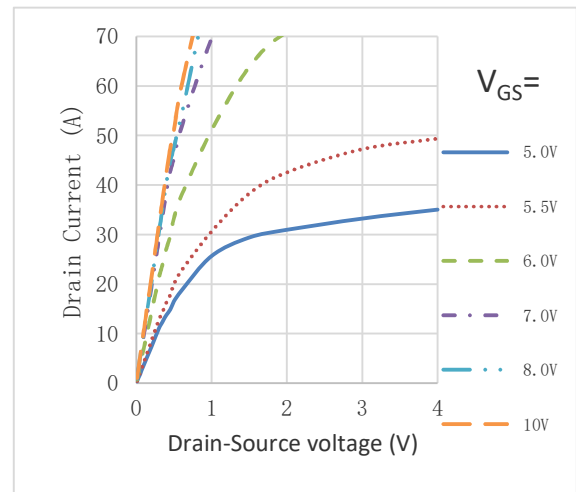


Fig.5 Threshold Voltage V.S Junction Temperature

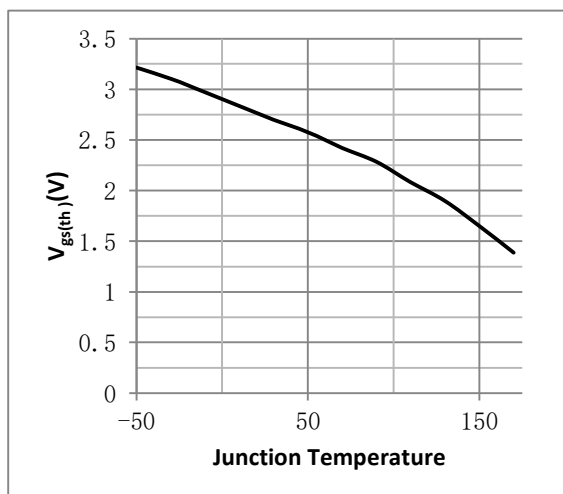


Fig.6 Resistance V.S Drain Current

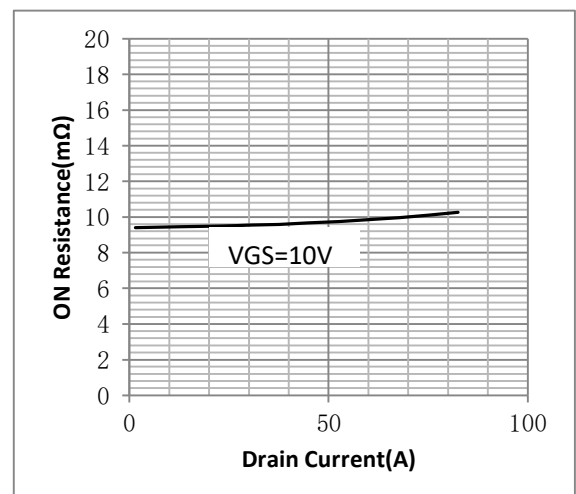


Fig.7 On-Resistance VS Gate Source Voltage

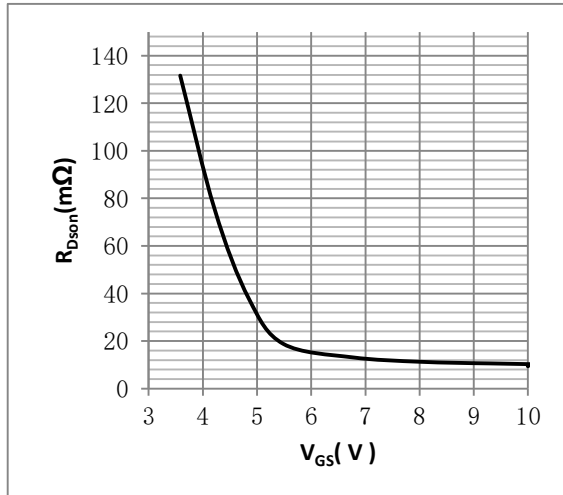


Fig.8 On-Resistance V.S Junction Temperature

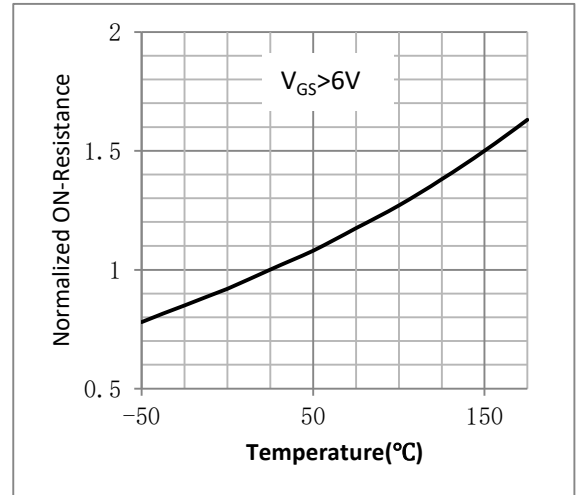


Figure 9. Diode Forward Voltage vs. Current

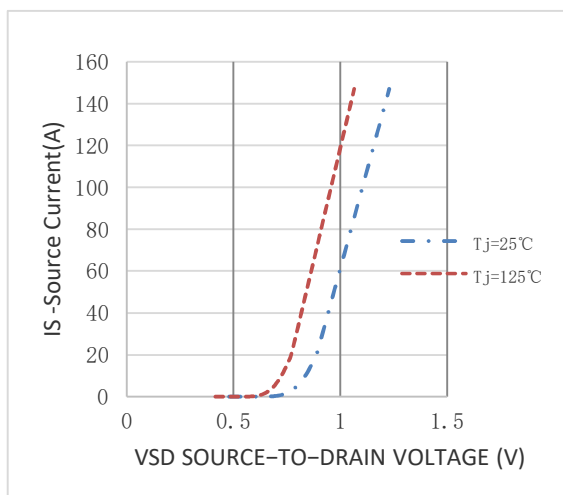


Figure 10. Transfer Characteristics

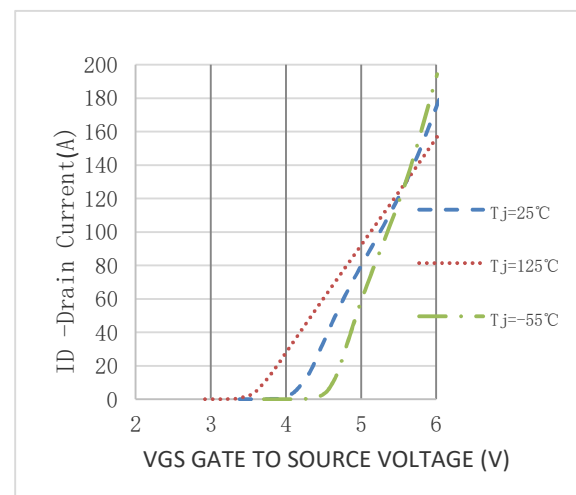


Fig.11 SOA Maximum Safe Operating Area

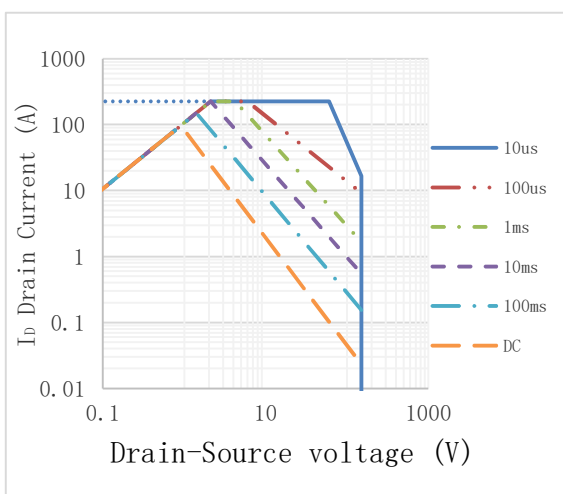
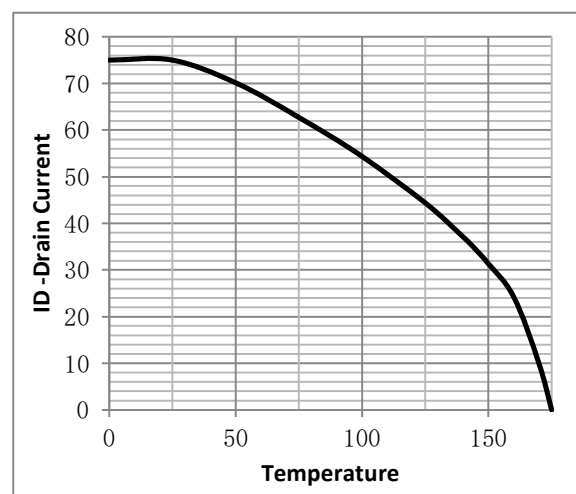
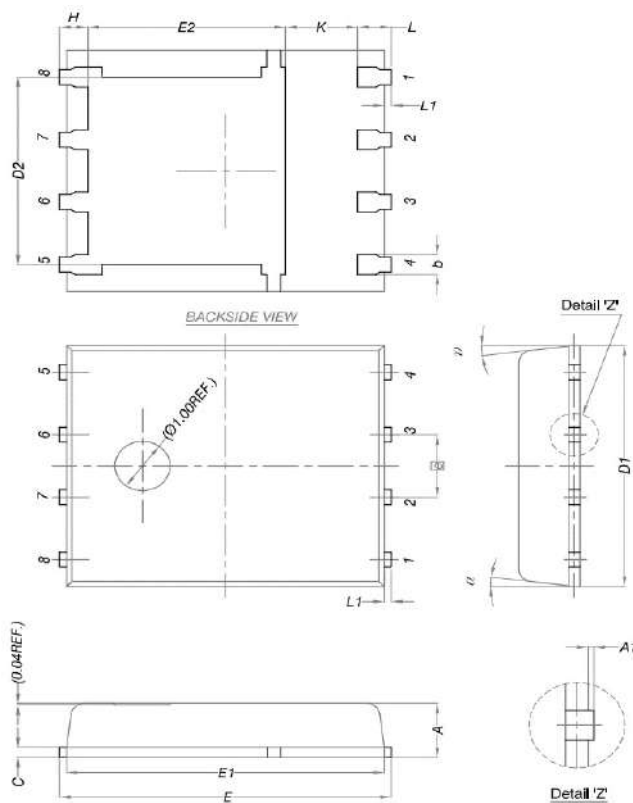


Fig.12 ID vs. Case Temperature^②



●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°