

• General Description

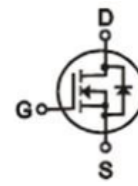
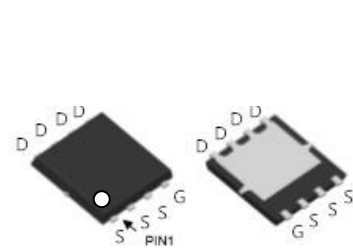
It combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

• Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

• Application

- Synchronous Rectification for AC-DC/DC-DC converter
- Oring switches
- Power Tools

• Product Summary

 $V_{DS} = 100V$
 $R_{DS(ON)} = 4.0m\Omega$
 $I_D = 160A$

DFN5 x 6
• Ordering Information:

Part NO.	ZMS040N10N
Marking	ZMS040N10
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

• Absolute Maximum Ratings (T_C =25°C)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	$I_D@TC=25^\circ C$	160	A
	$I_D@TC=75^\circ C$	121	A
	$I_D@TC=100^\circ C$	100	A
Pulsed Drain Current ①	I_{DM}	480	A
Total Power Dissipation(TC=25°C)	$P_D@TC=25^\circ C$	85	W
Total Power Dissipation(TA=25°C)	$P_D@TA=25^\circ C$	3.4	W
Operating Junction Temperature	T_J	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Single Pulse Avalanche Energy@L=0.1mH	E_{AS}	200	mJ

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R _{thJC}	-	-	1.5	° C/W
Thermal resistance, junction - ambient	R _{thJA}	-	-	37	° C/W
Soldering temperature, wave soldering for 10s	T _{sold}	-	-	265	° C

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	100			V
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250uA	1.2		2.5	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			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 =25A @ TC=25°C		4.0	5.2	mΩ
		V _{GS} =10V, I _D =25A @ TC=125°C		6.2		mΩ
		V _{GS} =4.5V, I _D =15A @ TC=25°C		5.0	6.5	mΩ
		V _{GS} =4.5V, I _D =15A @ TC=125°C		7.7		mΩ
Forward Transconductance	g _{FS}	V _{DS} =25V, I _D =10A		28		s
Source-drain voltage	V _{SD}	I _S =25A			1.28	V

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V f = 1MHz	-	4028	-	pF
Output capacitance	C _{oss}		-	1960	-	
Reverse transfer capacitance	C _{rss}		-	44	-	

•Gate Charge characteristics(T_a = 25°C)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q _g	V _{DD} = 25V	-	48	-	nC
Gate - Source charge	Q _{gs}	I _D = 8A	-	16	-	
Gate - Drain charge	Q _{gd}	V _{GS} = 10V	-	4.9	-	

Body Diode Reverse Recovery Time	trr	$I_F=20A,$ $di/dt=100A/\mu s$	33	nS
Body Diode Reverse Recovery Charge	Qrr	$I_F=20A,$ $di/dt=100A/\mu s$	170	nC

Note: ① Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$;

Fig.1 Gate-Charge Characteristics

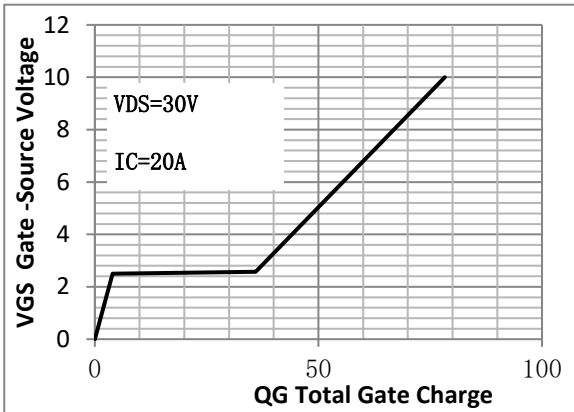


Fig.2 Capacitance Characteristics

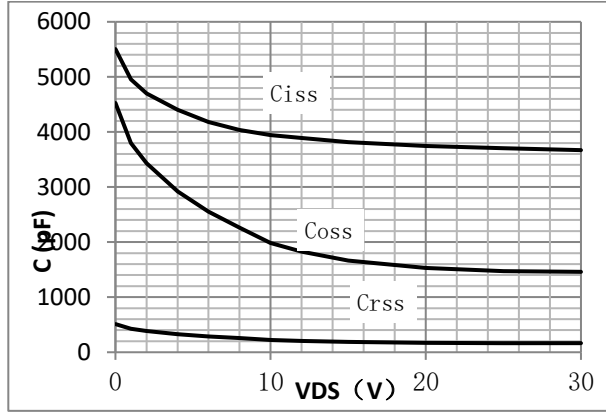


Fig.3 Power Dissipation

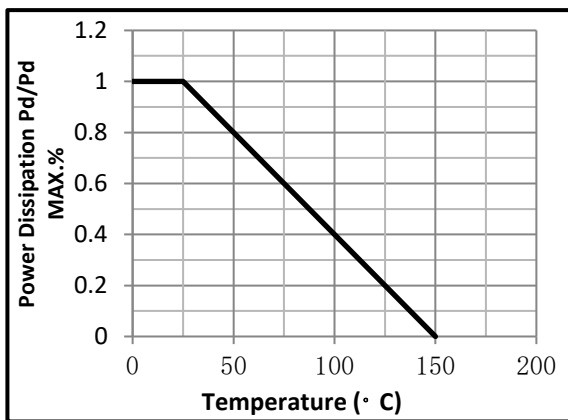


Fig.4 Typical output Characteristics

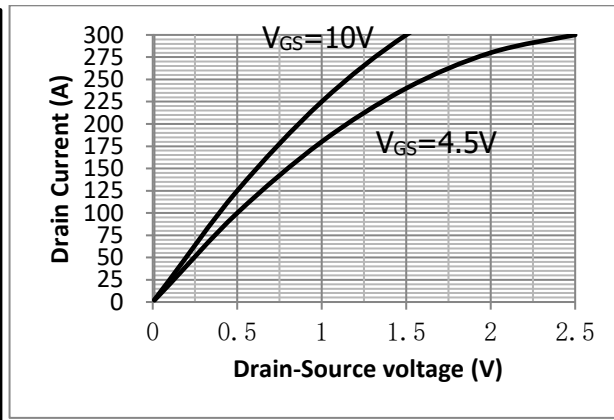


Fig.5 Threshold Voltage V.S Junction Temperature

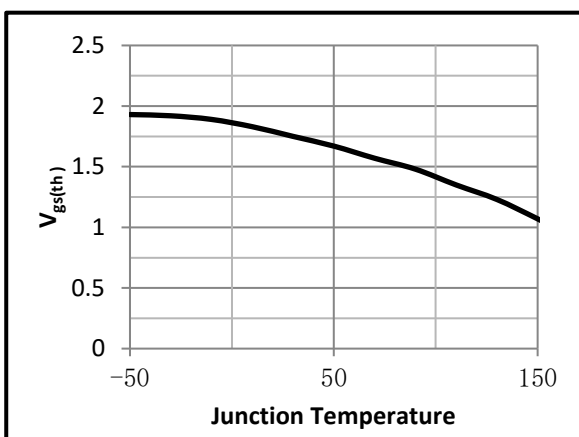


Fig.6 Resistance V.S Drain Current

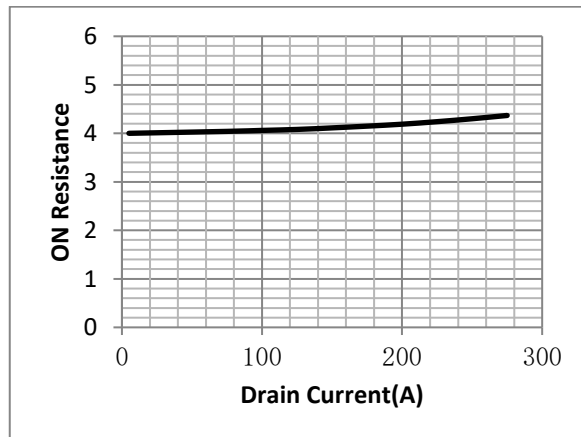


Fig.7 On-Resistance VS Gate Source Voltage

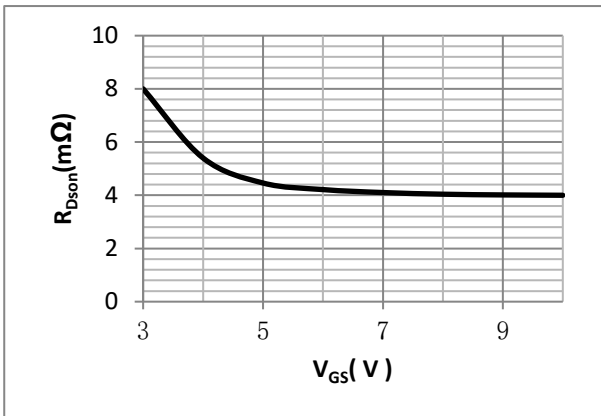


Fig.8 On-Resistance V.S Junction Temperature

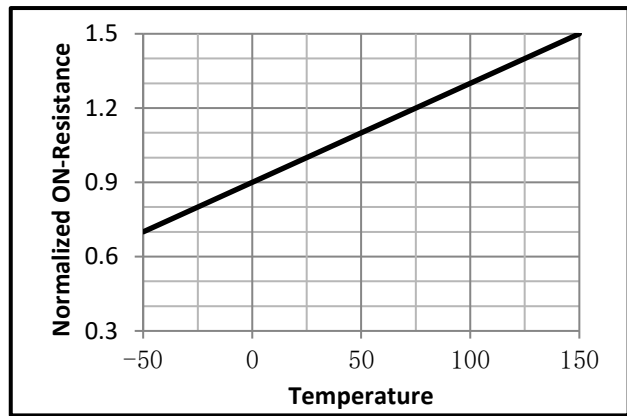


Fig.9 SOA Maximum Safe Operating Area

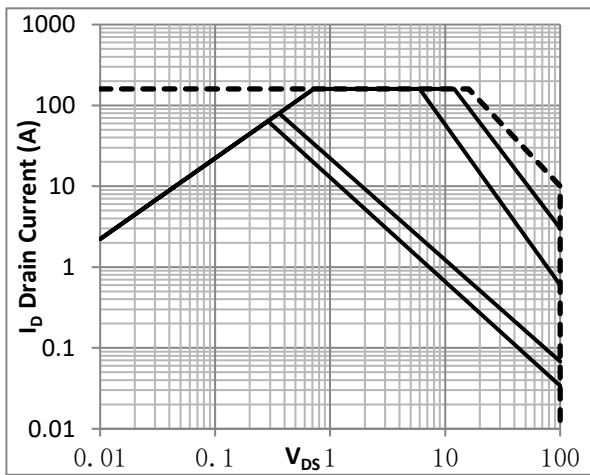


Fig.10 ID-Junction Temperature

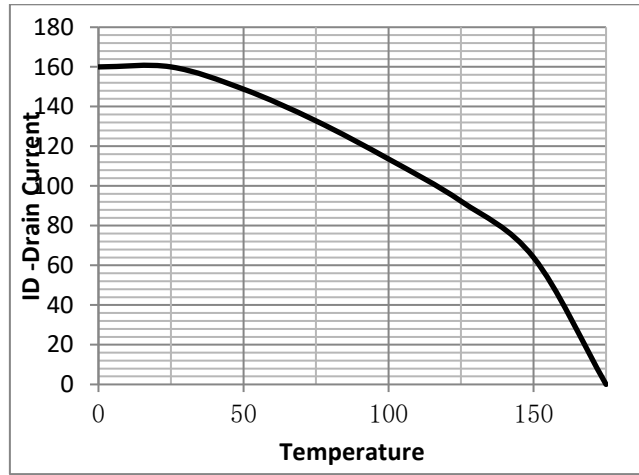


Fig.11 Switching Time Measurement Circuit

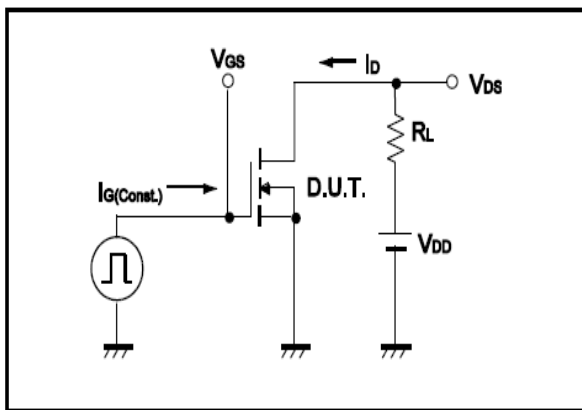


Fig.12 Gate Charge Waveform

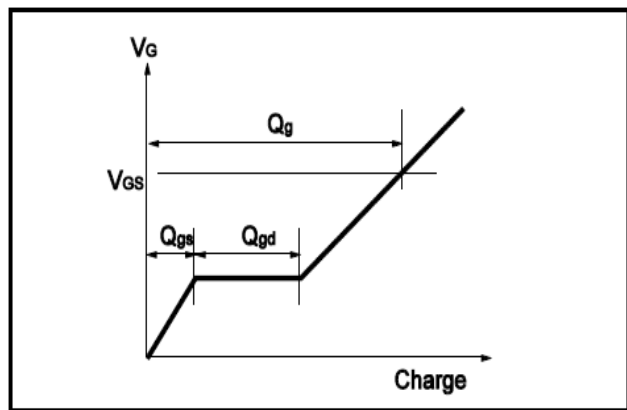


Fig.13 Switching Time Measurement Circuit

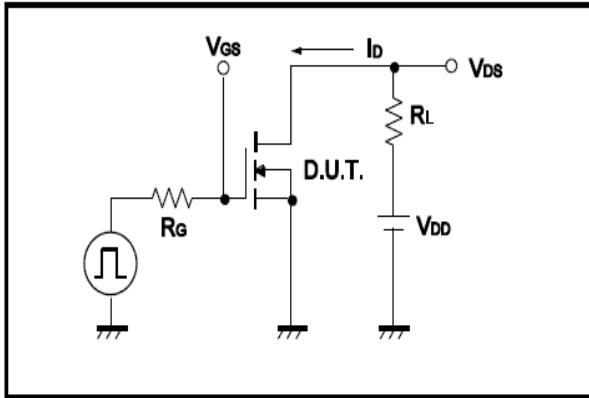


Fig.14 Gate Charge Waveform

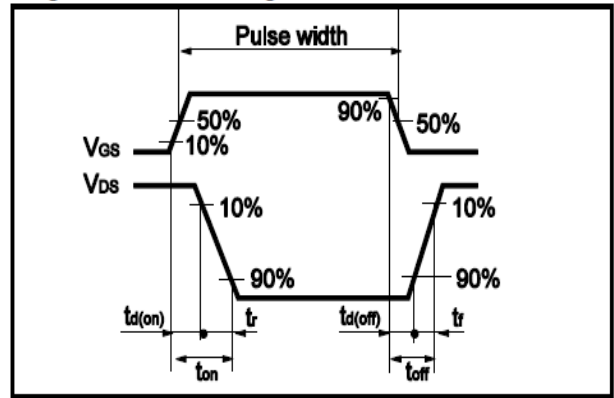


Fig.15 Avalanche Measurement Circuit

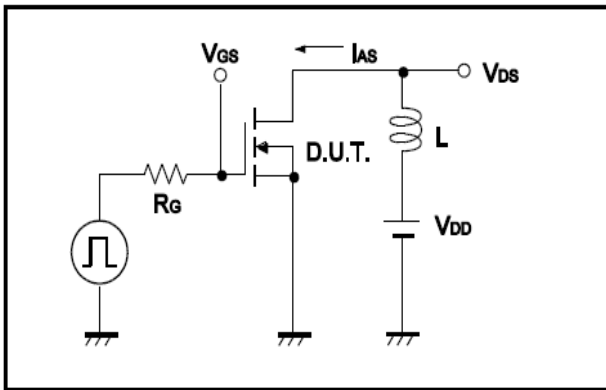
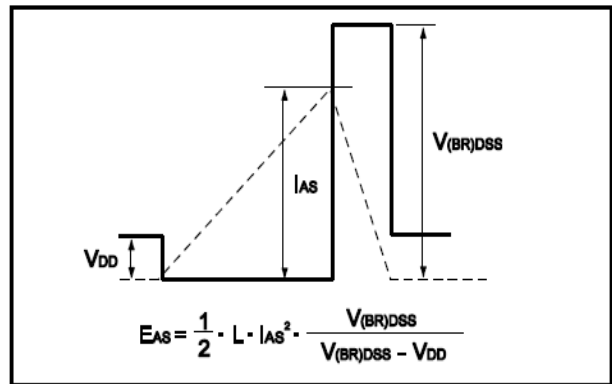


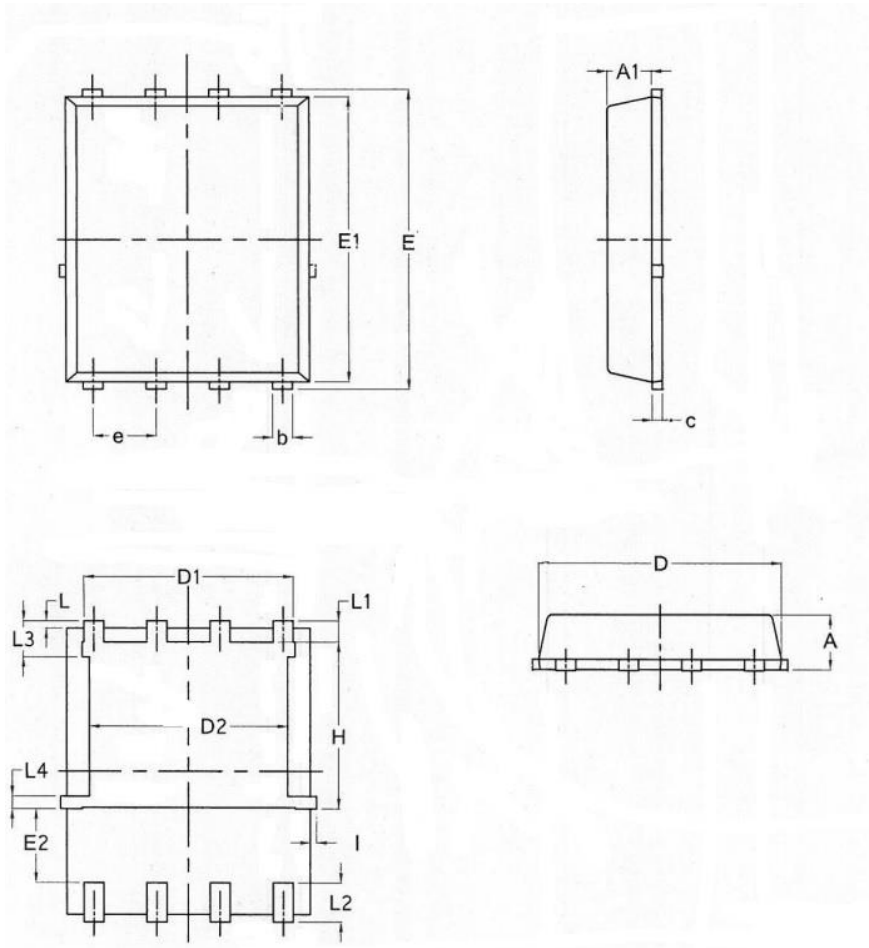
Fig.16 Avalanche Waveform





•Dimensions (DFN5x6)

Unit: mm



SYMBOL	COMMON					
	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.10	1.17	0.0354	0.0433	0.0461
A1	0.824	0.897	0.97	0.0324	0.0353	0.0382
b	0.33	0.41	0.50	0.0130	0.0161	0.0197
c	0.150	0.20	0.250	0.0059	0.0079	0.0098
D	4.80	4.90	5.00	0.1890	0.1929	0.1969
D1	3.91	4.22	4.36	0.1539	0.1661	0.1717
D2	3.85	4.00	4.15	0.1516	0.1575	0.1634
E	5.90	6.05	6.15	0.2323	0.2382	0.2421
E1	5.65	5.76	5.85	0.2224	0.2268	0.2303
E2	1.10	/	/	0.0433	/	/
e	1.27 BSC			0.050 BSC		
L	0.05	0.15	0.25	0.0020	0.0059	0.0098
L1	0.36	0.425	0.50	0.0150	0.0167	0.0197
L2	0.51	0.785	0.86	0.0201	0.0309	0.0339
L3	0.55	0.70	0.85	0.0217	0.0276	0.0335
L4	0.10	0.25	0.40	0.0039	0.0098	0.0157
H	3.25	3.35	3.58	0.1280	0.1319	0.1409
I	0	/	0.18	0	/	0.0071