

General Description

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

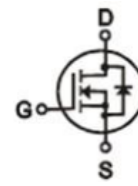
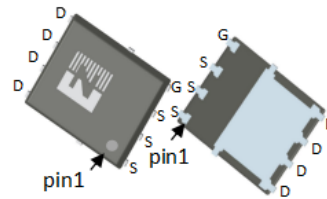
Features

- 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


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

DFN5*6

Ordering Information:

Part NO.	ZMS040N10HN
Marking	ZMS040N10H
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D @ TC=25^\circ C$	100	A
	$I_D @ TC=75^\circ C$	76	A
	$I_D @ TC=100^\circ C$	63	A
Pulsed Drain Current ^①	I_{DM}	300	A
Body-Diode Continuous Current	I_S	100	A
Total Power Dissipation	$P_D @ TC=25^\circ C$	85	W
Total Power Dissipation	$P_D @ TA=25^\circ C$	3.4	W
Operating Junction Temperature	T_J	-55 to 150	$^\circ C$
Storage Temperature	T_{STG}	-55 to 150	$^\circ C$
Single Pulse Avalanche Energy @ $L=0.1mH$	E_{AS}	320	mJ

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R _{thJC}	-	-	2.8	° C/W
Thermal resistance, junction - ambient	R _{thJA}	-	-	62	° 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	2.0	2.8	4.0	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		4.0	5.2	mΩ
Forward Transconductance	g _{FS}	V _{DS} = 25V, I _D = 10A		28		s
Source-drain voltage	V _{SD}	I _S = 25A			1.28	V

•Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	f = 1MHz, V _{DS} = 25V	-	4028	-	pF
Output capacitance	C _{oss}		-	1960	-	
Reverse transfer capacitance	C _{rss}		-	44	-	
Gate Resistance	R _g	f = 1MHz		2.5		Ω
Total gate charge	Q _g	V _{DD} = 25V I _D = 5A V _{GS} = 10V	-	48	-	nC
Gate - Source charge	Q _{gs}		-	16	-	
Gate - Drain charge	Q _{gd}		-	4.9	-	
Turn-ON Delay time	t _{D(on)}	V _{GS} = 10V, V _{DS} = 50V R _G = 3Ω, R _L = 2.5 Ω		15		ns
Turn-ON Rise time	t _r			6		ns
Turn-Off Delay time	t _{D(off)}			37		ns
Turn-Off Fall time	t _f			8		ns
Reverse Recovery Time	t _{RR}	V _{DD} = 20 V, dI _S /dt = 500 A/s, I _S = 20 A		40		ns
Reverse Recovery Charge	Q _{RR}			230		nC

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

Fig.1 Gate-Charge Characteristics

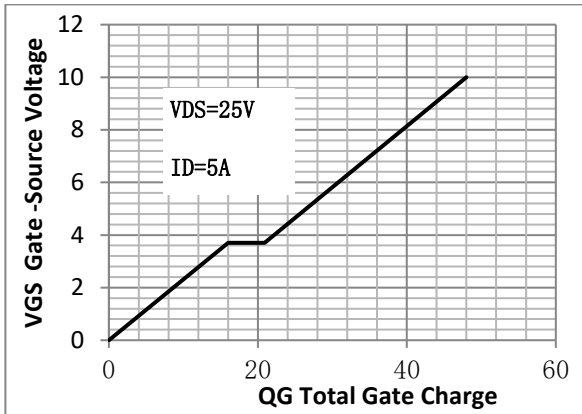


Fig.2 Capacitance Characteristics

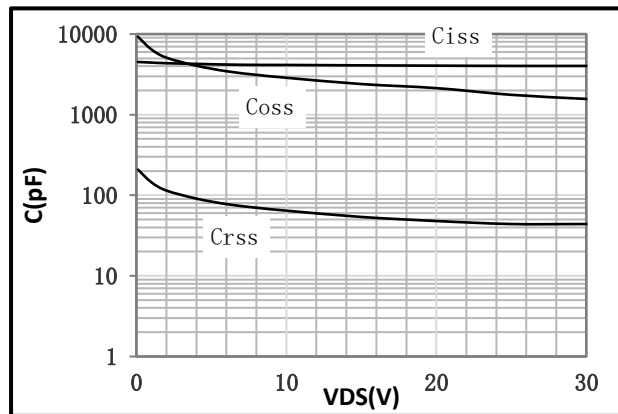


Fig.3 Power Dissipation

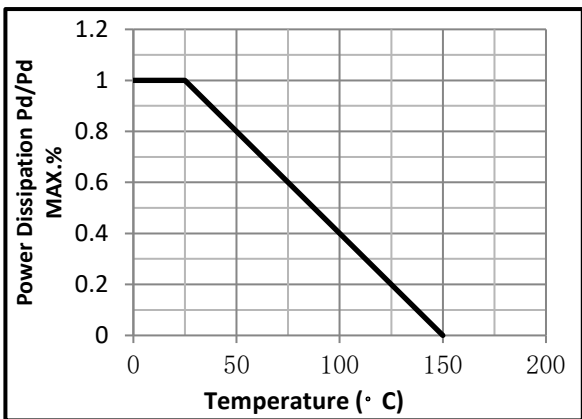


Fig.4 Typical output Characteristics

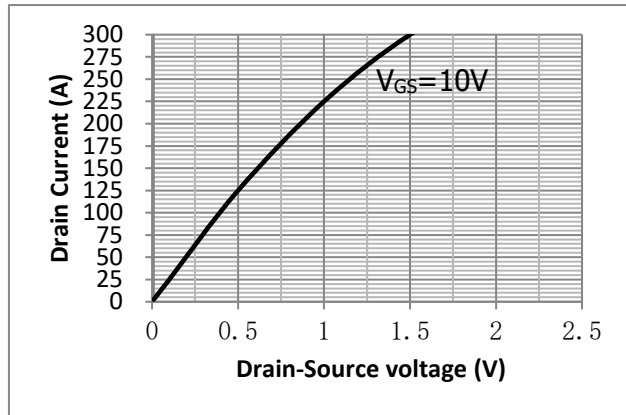


Fig.5 Threshold Voltage V.S Junction Temperature

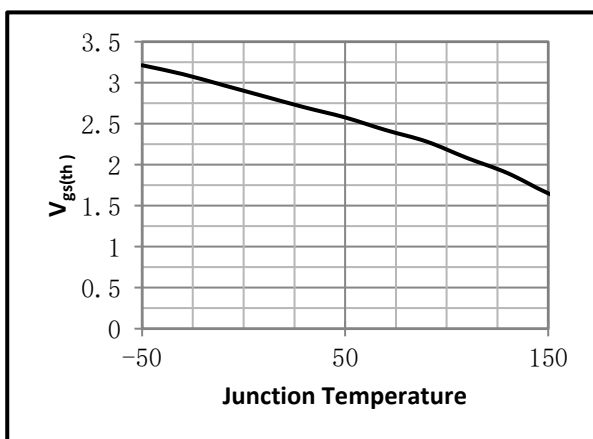


Fig.6 Resistance V.S Drain Current

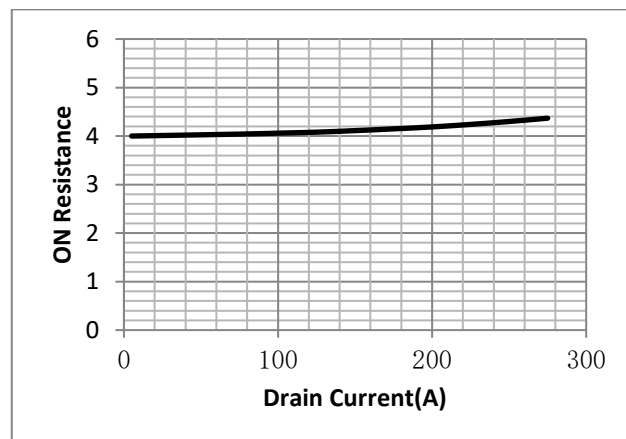


Fig.7 On-Resistance VS Gate Source Voltage

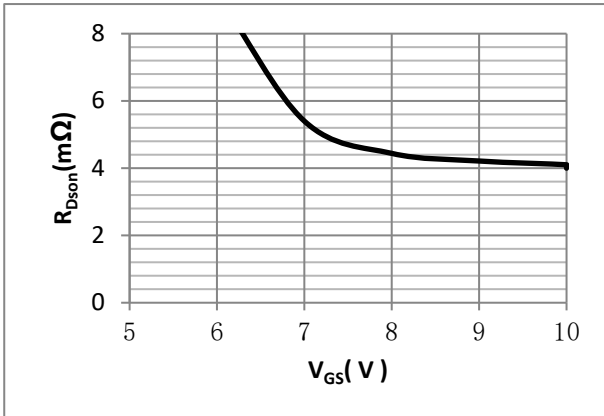


Fig.8 On-Resistance V.S Junction Temperature

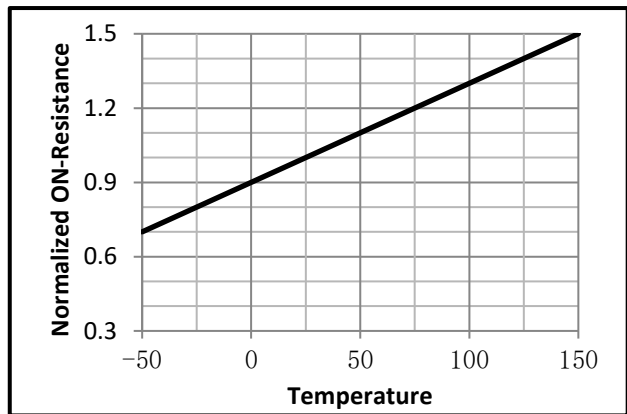


Fig.9 SOA Maximum Safe Operating Area

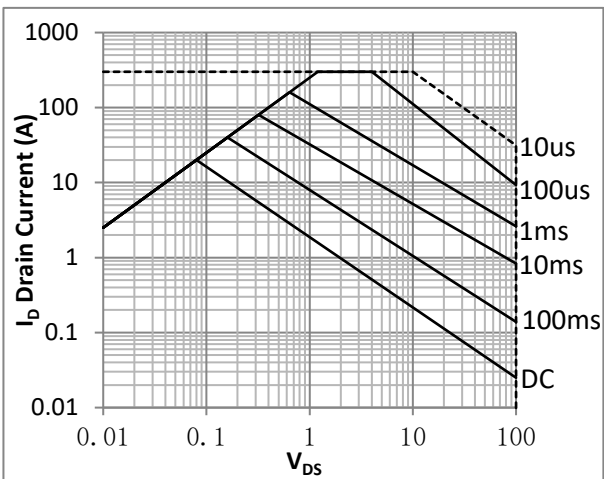


Fig.10 I_D -Junction Temperature

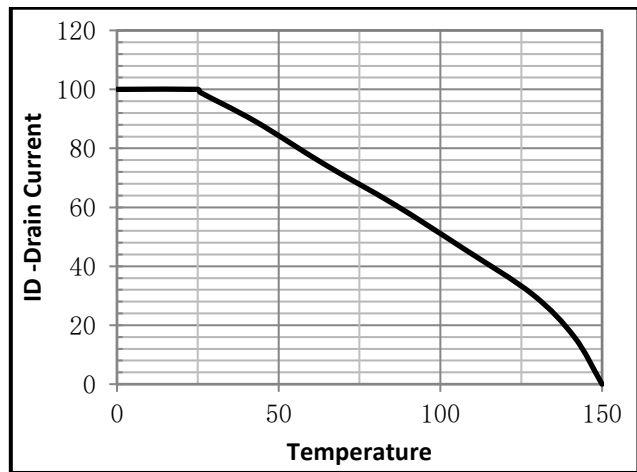


Fig.11 Gate Charge Measurement Circuit

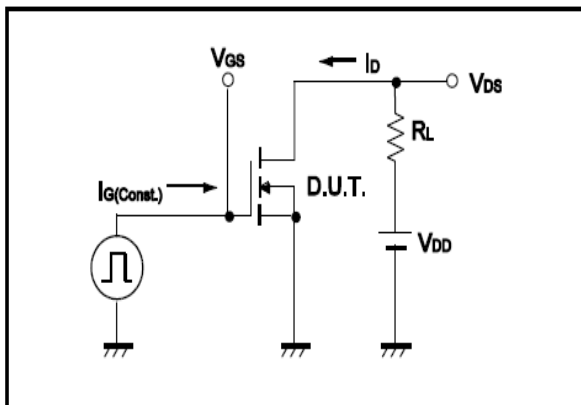


Fig.12 Gate Charge Waveform

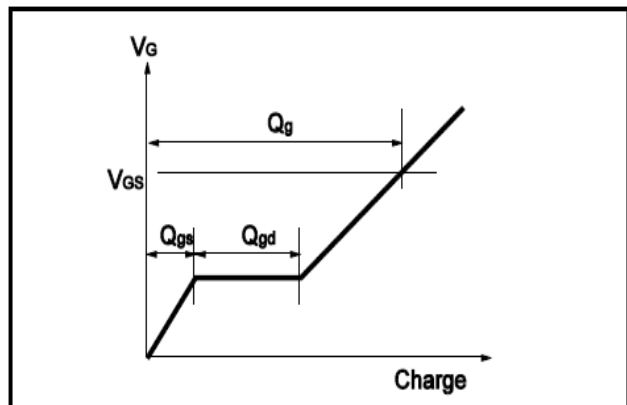


Fig.13 Switching Time Measurement Circuit

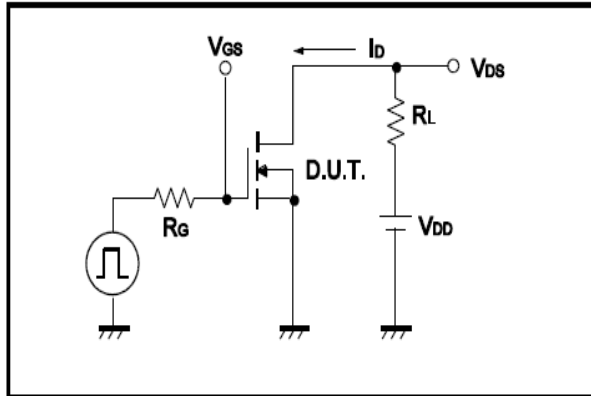


Fig.14 Switching Time Waveform

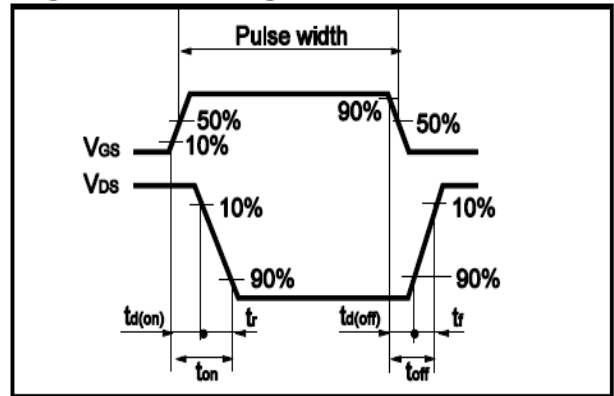


Fig.15 Avalanche Measurement Circuit

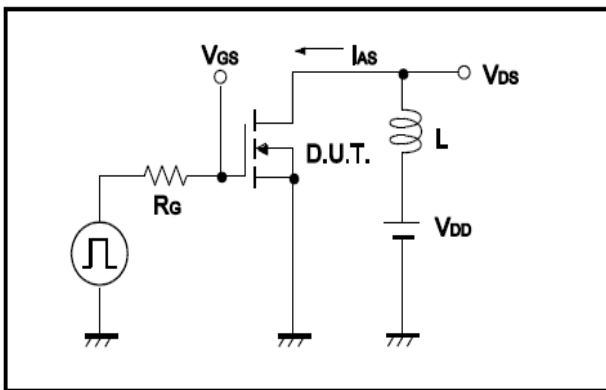
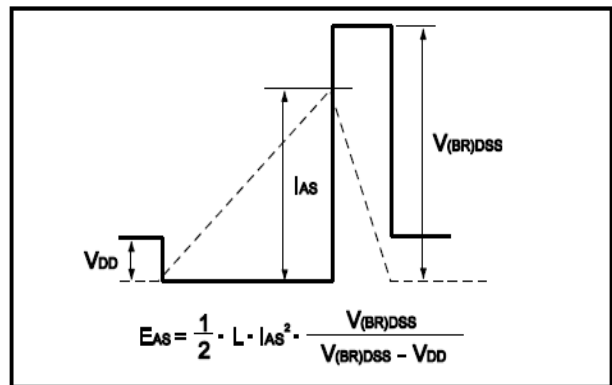


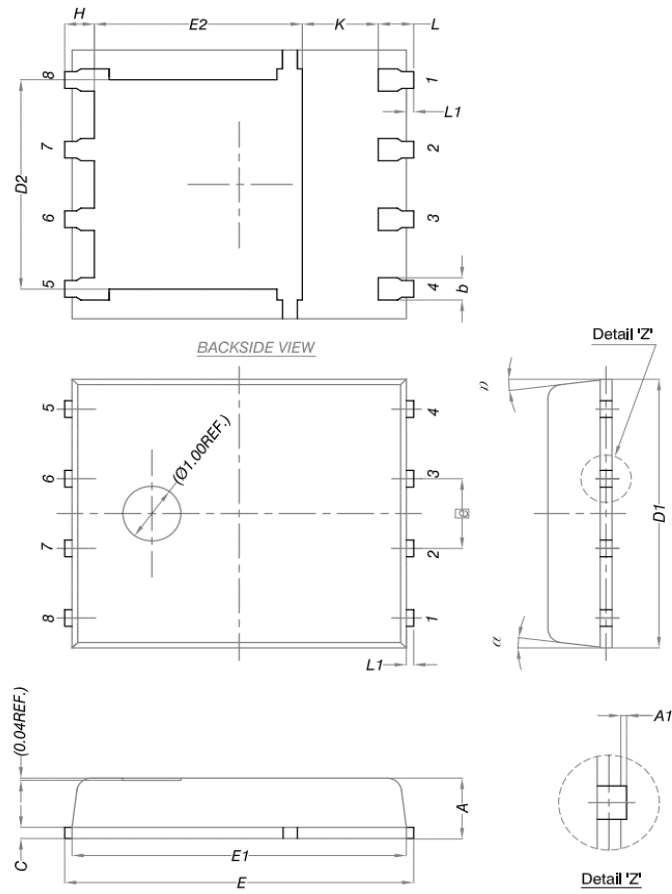
Fig.16 Avalanche Waveform





•Dimensions (DFN5x6)

Unit: mm



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°