

• General Description

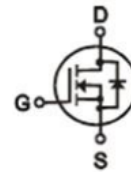
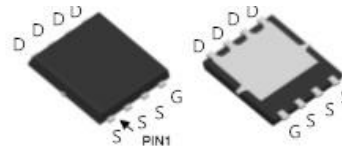
It combines advanced MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

• Features

- Advance device constructure
- Low $R_{DS(ON)}$ to minimize conduction loss
- Low Gate Charge for fast switching
- Low Thermal resistance

• Application

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

• Product Summary

 $V_{DS} = 60V$
 $R_{DS(ON)} = 5.2m\Omega$
 $I_D = 80A$


DFN5 x 6

• Ordering Information:

Part NO.	ZMS052N06N
Marking	ZMS052N06
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}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_{D@TC=25^\circ C}$	80	A
	$I_{D@TC=75^\circ C}$	61	A
	$I_{D@TC=100^\circ C}$	50	A
Pulsed Drain Current ①	I_{DM}	240	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	E_{AS}	280	mJ

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}			1.5	$^{\circ}C/W$
Thermal resistance, junction - ambient	R_{thJA}	-	-	37	$^{\circ}C/W$
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	$^{\circ}C$

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	60			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	1.5		2.5	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 0.8 BV_{DSS}, V_{GS} = 0V$			1.0	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 10A$		5.2	6.5	m Ω
		$V_{GS} = 4.5V, I_D = 5A$		6.8	8.5	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = 25V, I_D = 10A$		16		S
Source-drain voltage	V_{SD}	$I_S = 10A$			1.28	V

•Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	$f = 1MHz, V_{DS} = 25V$	-	1910	-	pF
Output capacitance	C_{oss}		-	1070	-	
Reverse transfer capacitance	C_{rss}		-	22	-	
Gate Resistance	R_g	$f = 1MHz$		2.1		Ω
Total gate charge	Q_g	$V_{DD} = 15V, I_D = 5A, V_{GS} = 10V$	-	24	-	nC
Gate - Source charge	Q_{gs}		-	5	-	
Gate - Drain charge	Q_{gd}		-	3.3	-	
Turn-ON Delay time	$t_{D(on)}$	$V_{GS} = 10V, V_{DS} = 15V, R_G = 6\Omega, I_D = 15A$		8.5		ns
Turn-ON Rise time	t_r			7.5		ns
Turn-Off Delay time	$t_{D(off)}$			38		ns
Turn-Off Fall time	t_f			8		ns

Reverse Recovery Time	t_{RR}	$V_{DD} = 20\text{ V},$ $dI_S/dt = 100$ $\text{A/s}, I_S = 30\text{ A}$	22	ns
Reverse Recovery Charge	Q_{RR}		80	nC

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

Fig.1 Gate-Charge Characteristics

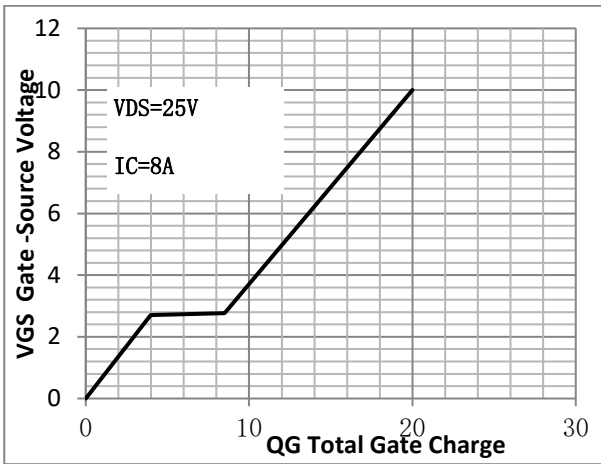


Fig.2 Capacitance Characteristics

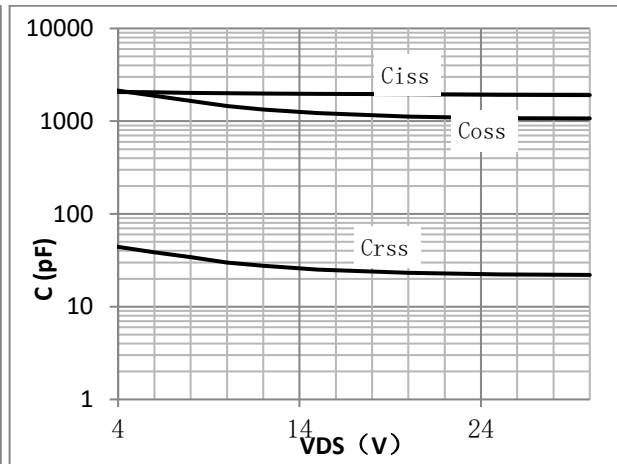


Fig.3 Power Dissipation

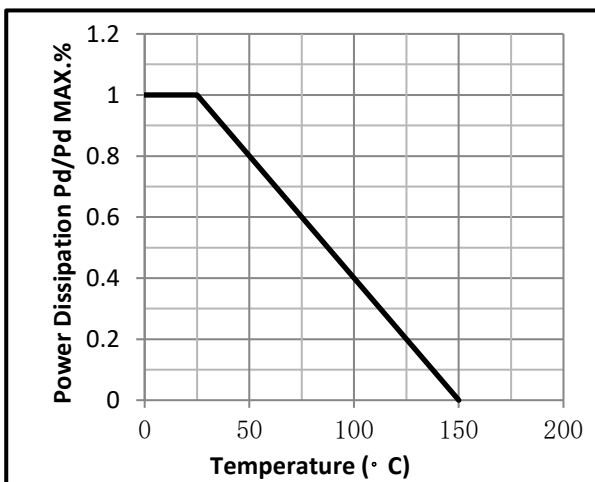


Fig.4 Typical output Characteristics

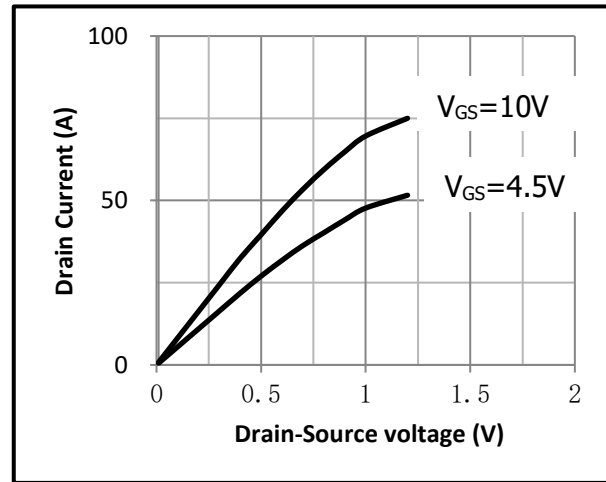


Fig.5 Threshold Voltage V.S Junction Temperature

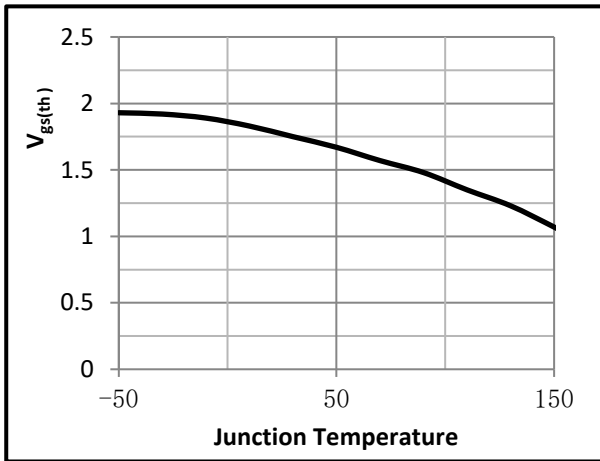


Fig.6 Resistance V.S Drain Current

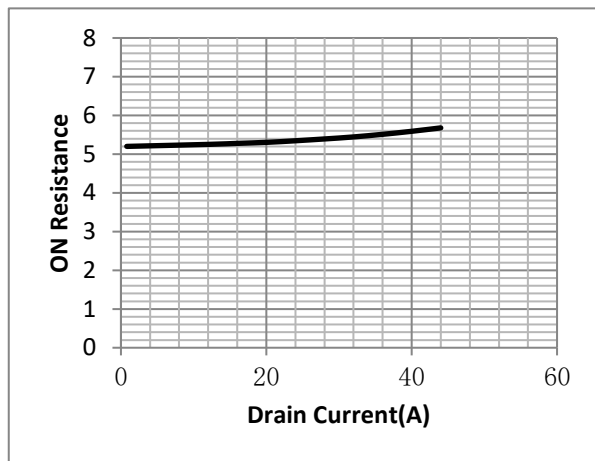


Fig.7 On-Resistance VS Gate Source Voltage

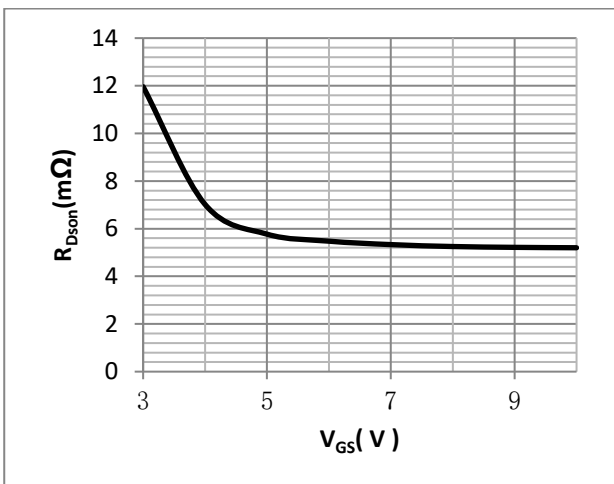


Fig.8 On-Resistance V.S Junction Temperature

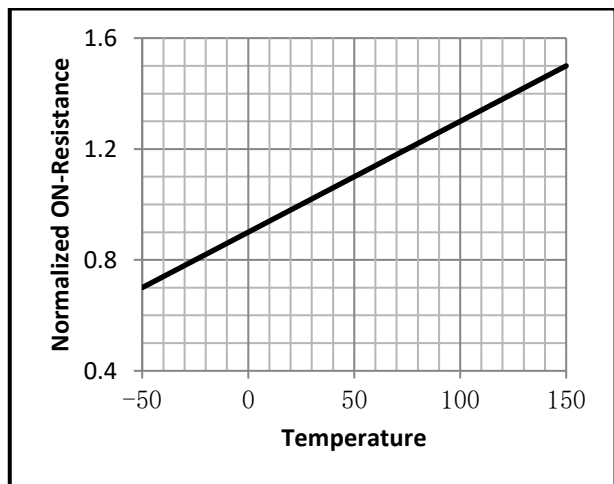


Fig.9 SOA Maximum Safe Operating Area

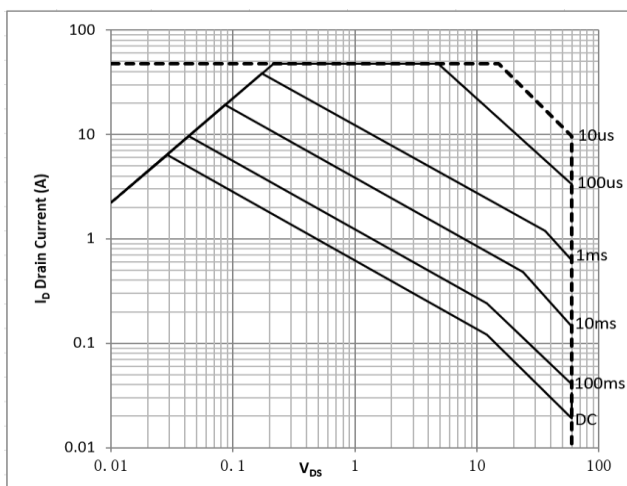


Fig.10 ID-Junction Temperature

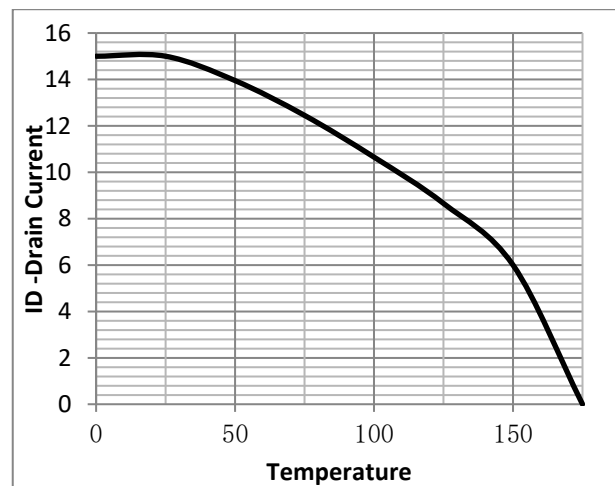


Fig.11 Switching Time Measurement Circuit

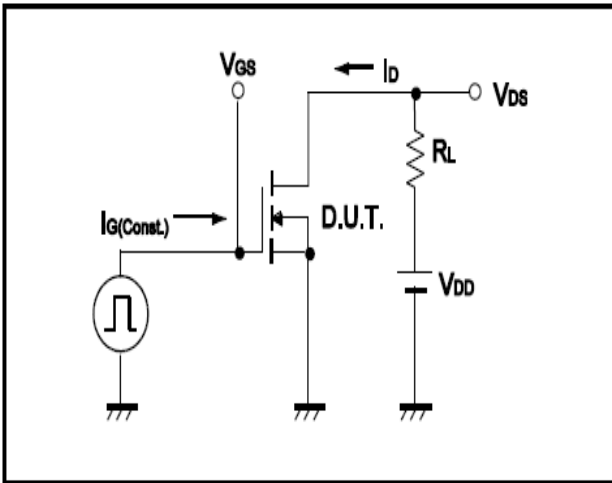


Fig.12 Gate Charge Waveform

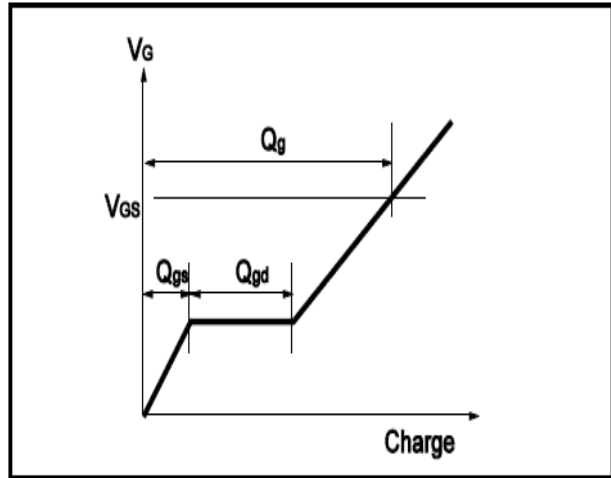


Fig.13 Switching Time Measurement Circuit

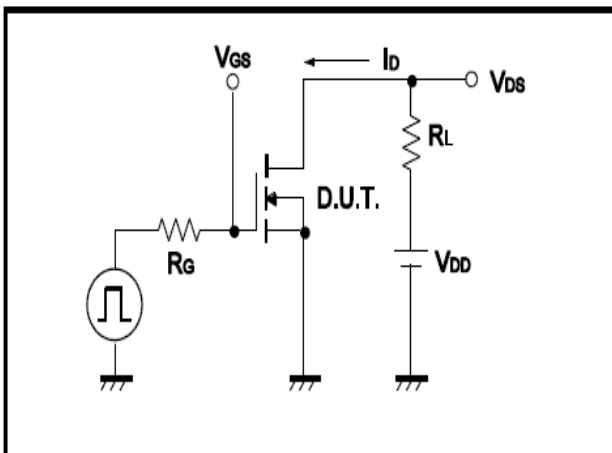
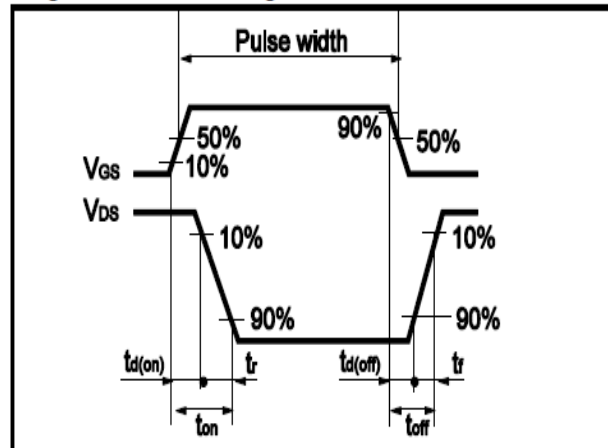


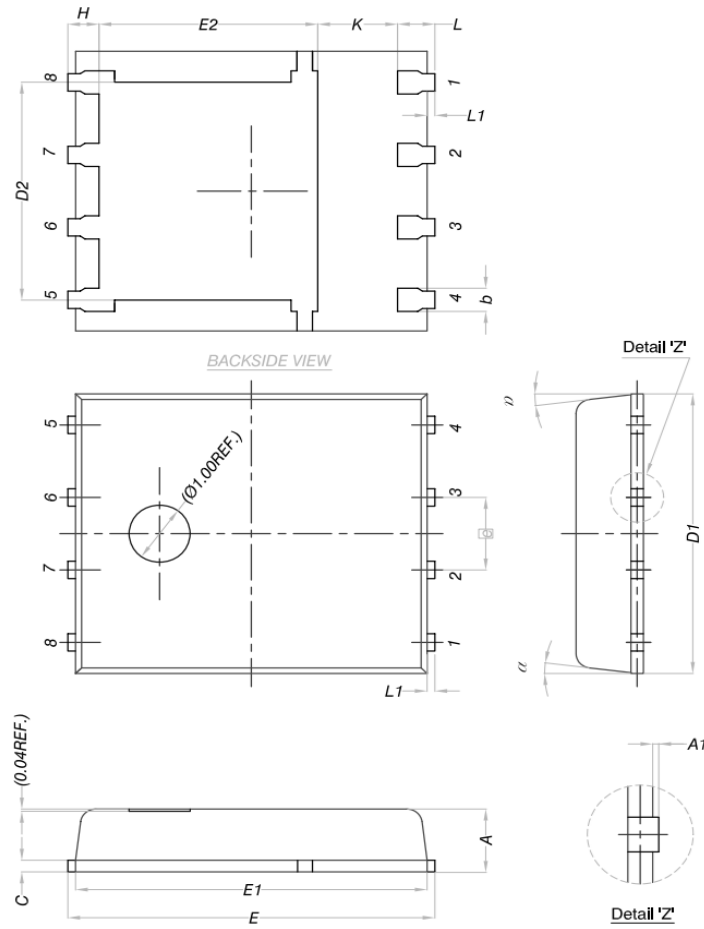
Fig.14 Gate Charge Waveform





•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
$\square e$	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°