

• General Description

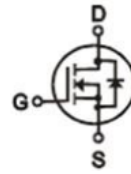
The ZM045N03N combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

• 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

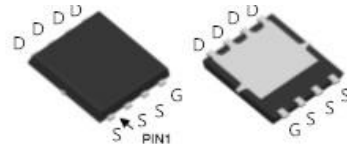
- MB/VGA Vcore
- Synchronous Rectifier
- BLDC Motor driver

• Product Summary


$V_{DS} = 30V$

$R_{DS(ON)} = 4.5m\Omega$

$I_D = 75A$


DFN5 x 6
• Ordering Information:

Part NO.	ZM045N03N
Marking	ZM045N03
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}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D @ T_C = 25^\circ C$	75	A
	$I_D @ T_C = 75^\circ C$	57	A
	$I_D @ T_C = 100^\circ C$	47	A
	$I_D @ T_A = 25^\circ C$	24	A
	$I_D @ T_A = 75^\circ C$	18.2	A
Pulsed Drain Current ^①	I_{DM}	180	A
Total Power Dissipation	$P_D @ T_C = 25^\circ C$	80	W
Total Power Dissipation	$P_D @ T_A = 25^\circ C$	2.5	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}	100	mJ

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R _{thJC}	-	-	1.6	° C/W
Thermal resistance, junction - ambient	R _{thJA}	-	-	50	° C/W
Soldering temperature, wavesoldering 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	30			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} =30V, 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 =20A		4.5	6.0	mΩ
		V _{GS} =4.5V, I _D =10A		7.0	9.0	mΩ
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =10A		7		s
Source-drain voltage	V _{SD}	I _S =20A		0.8	1.28	V

•Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	f = 1MHz	-	1500	-	pF
Output capacitance	C _{oss}		-	280	-	
Reverse transfer capacitance	C _{rss}		-	140	-	
Total gate charge	Q _g	V _{DD} = 25V	-	31	-	nC
Gate - Source charge	Q _{gs}	I _D = 8A	-	4.3	-	
Gate - Drain charge	Q _{gd}	V _{GS} = 10V	-	8.7	-	
Turn-ON Delay time	t _{D(on)}	V _{GS} =10V, V _{DS} =15V R _G =3.3Ω, I _D =15A		7.5		ns
Turn-ON Rise time	t _r			14		ns
Turn-Off Delay time	t _{D(off)}			35		ns
Turn-Off Fall time	t _f			10		ns

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

Fig.1 Power Dissipation

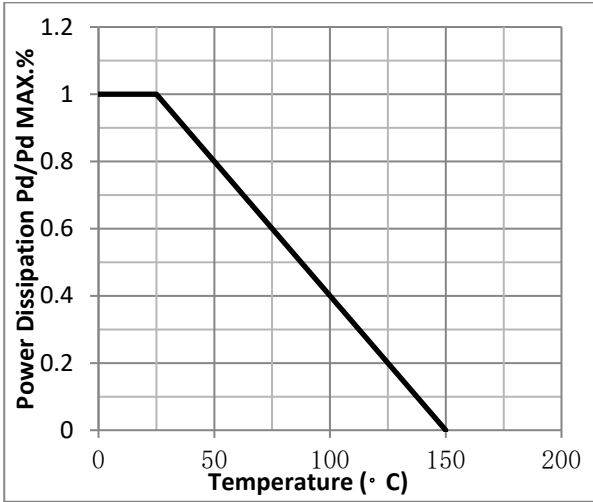


Fig.2 Typical output Characteristics

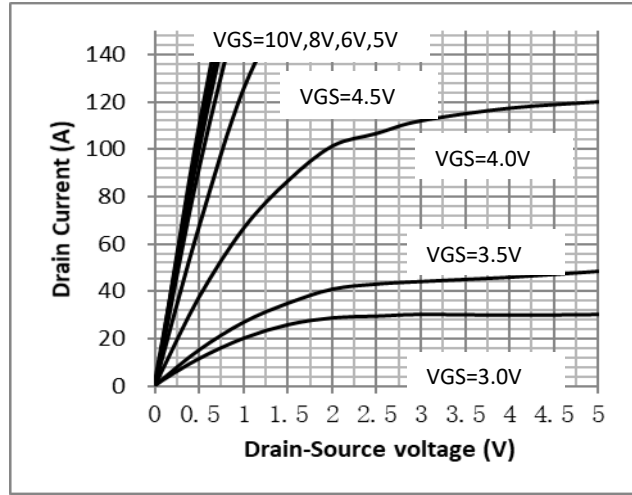


Fig.3 Threshold Voltage V.S Junction Temperature

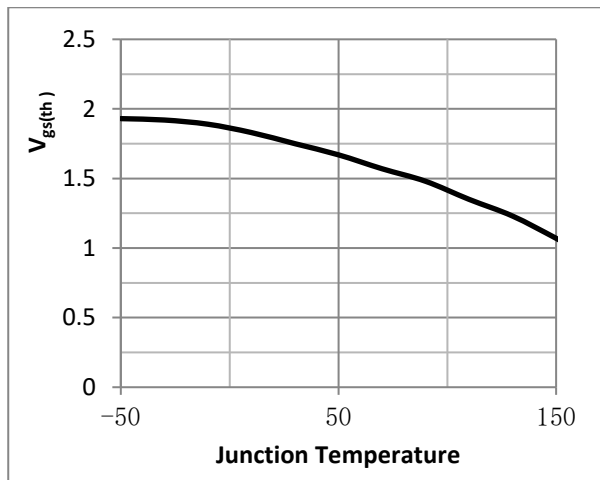


Fig.4 Resistance V.S Drain Current

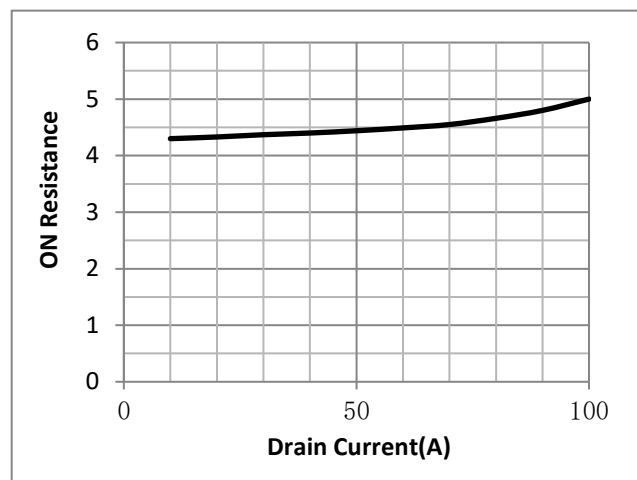


Fig.5 On-Resistance VS Gate Source Voltage

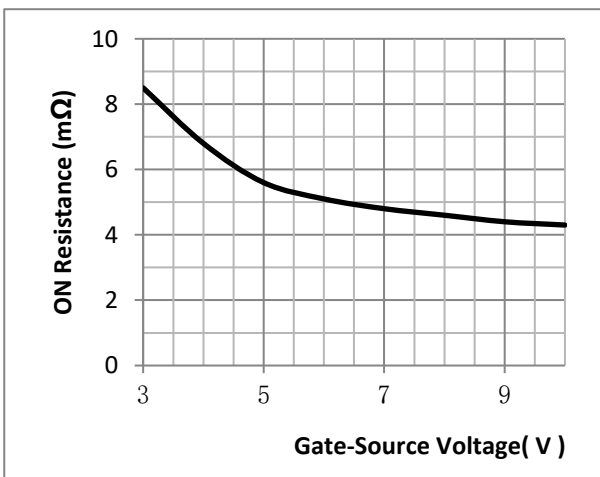


Fig.6 On-Resistance V.S Junction Temperature

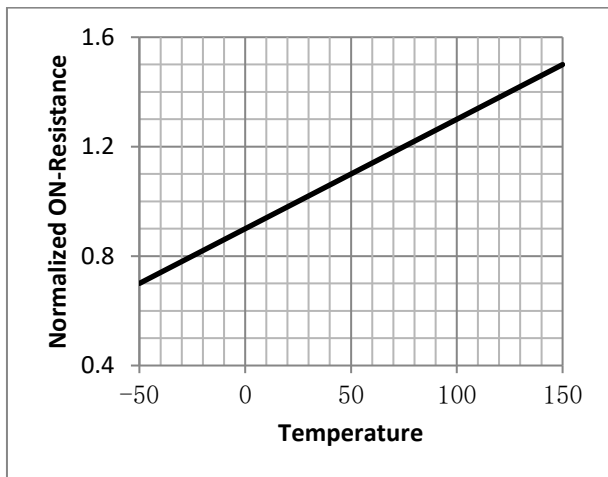


Figure 7. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

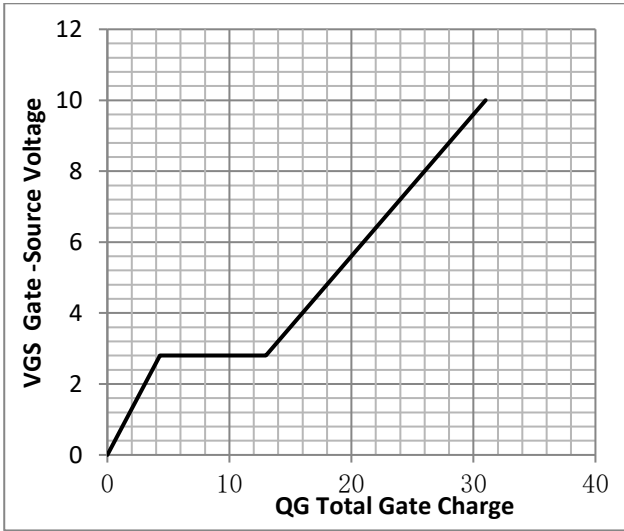


Fig.8 Capacitance Variation

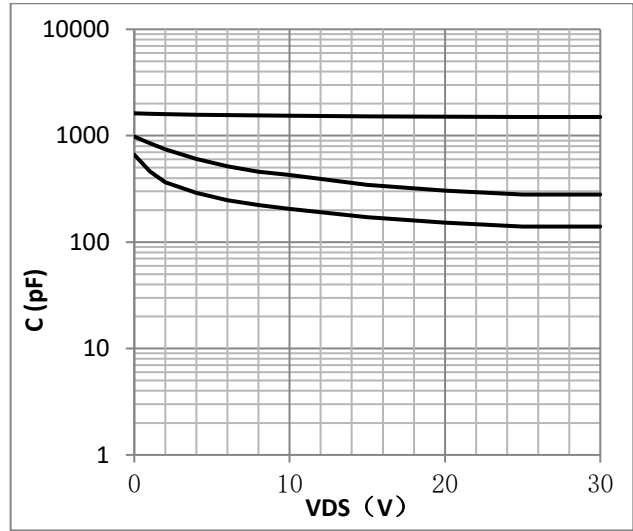


Figure 9. Diode Forward Voltage vs. Current

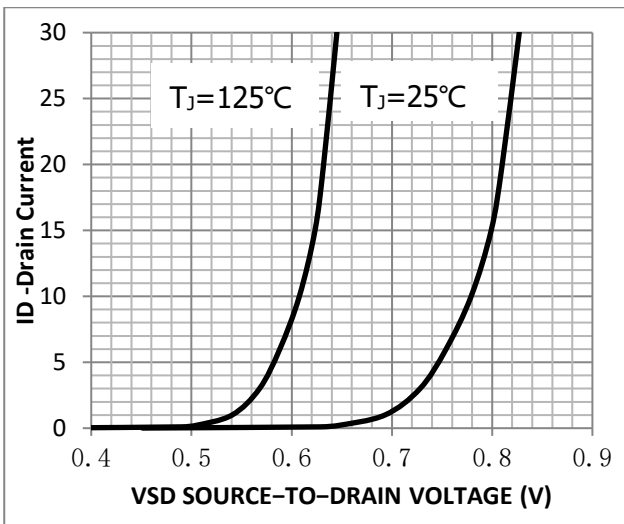


Figure 10. Transfer Characteristics

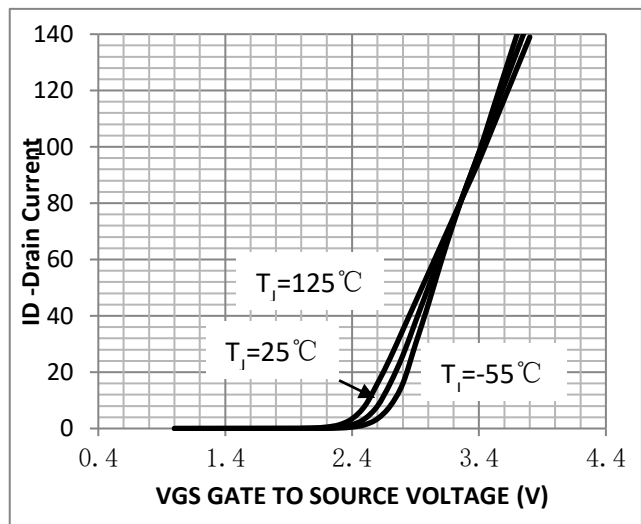


Fig.11 SOA Maximum Safe Operating Area

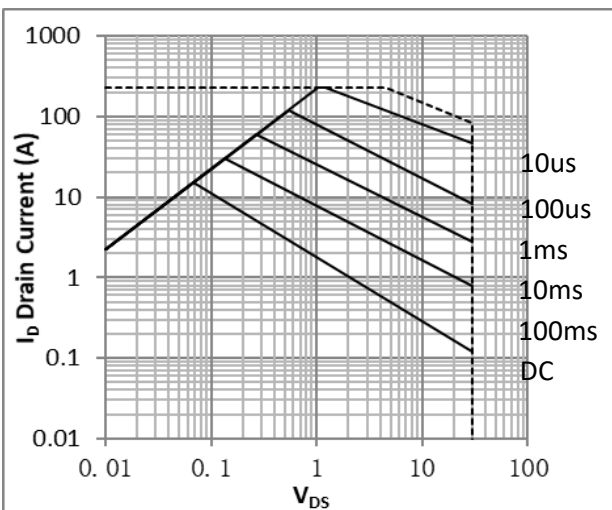


Fig.12 ID-Junction Temperature

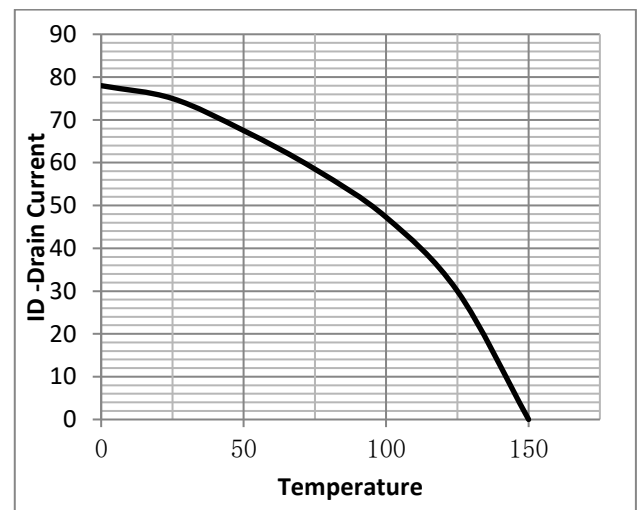


Fig.13 Switching Time Measurement Circuit

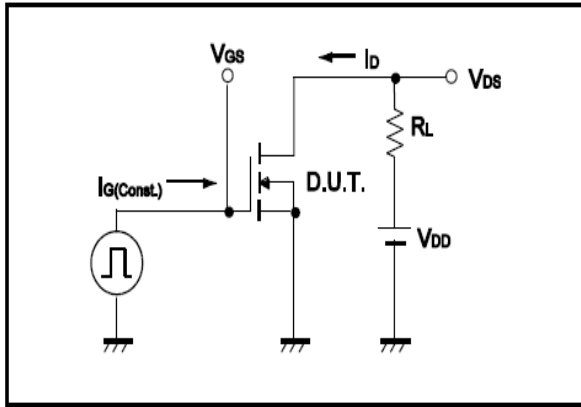


Fig.14 Gate Charge Waveform

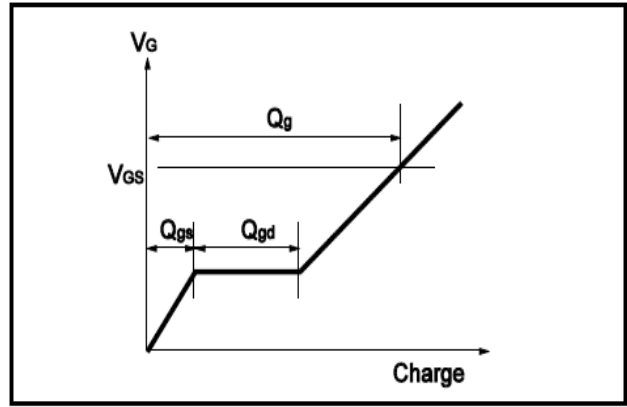


Fig.15 Switching Time Measurement Circuit

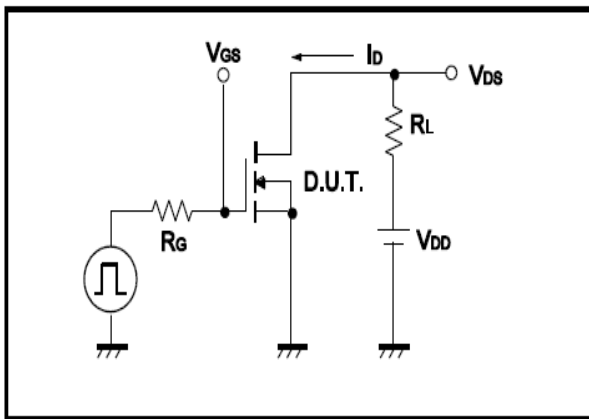


Fig.16 Gate Charge Waveform

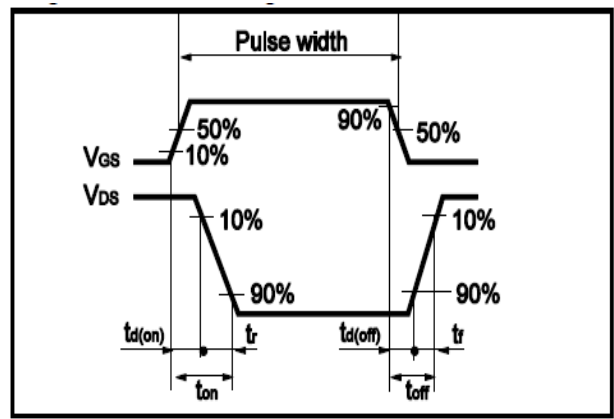


Fig.17 Avalanche Measurement Circuit

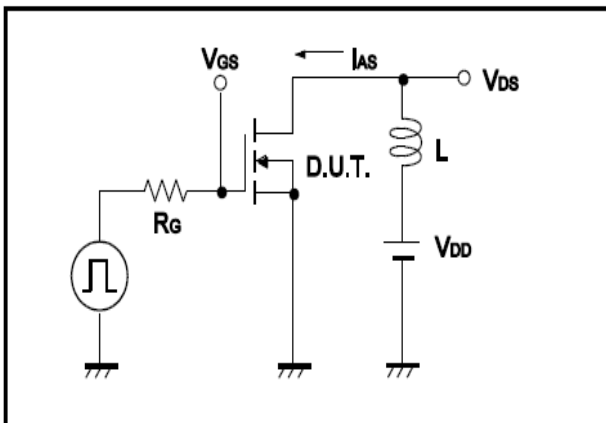
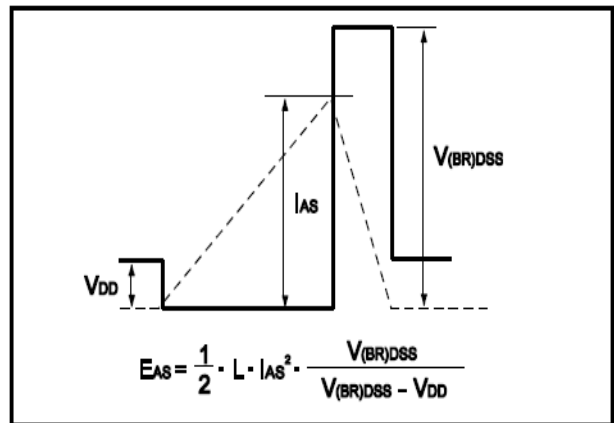


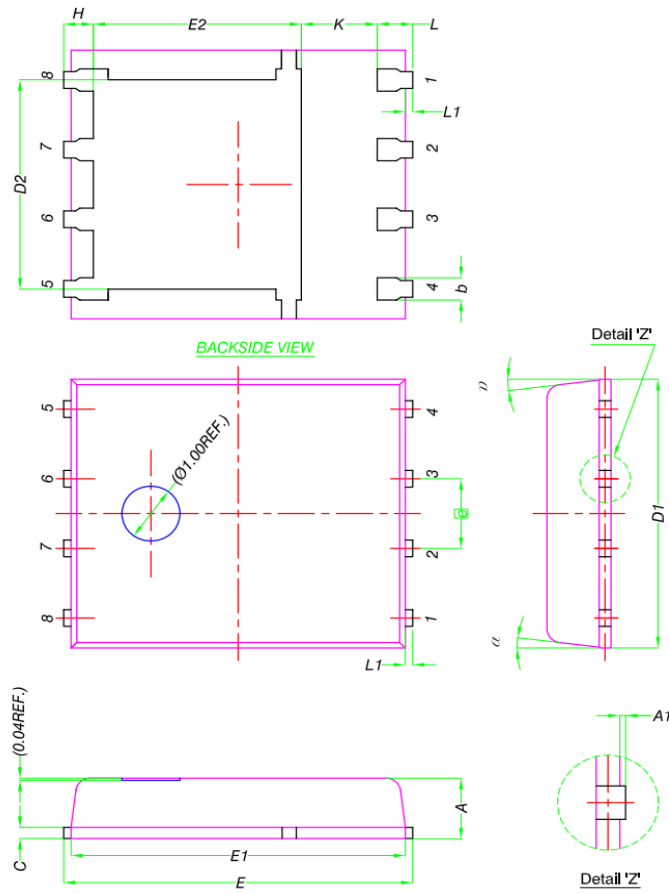
Fig.18 Avalanche Waveform





•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°