

• General Description

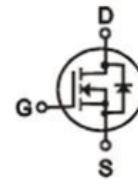
It combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

• 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

- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

• Product Summary


$V_{DS} = 30V$

$R_{DS(ON)} = 1.1m\Omega$

$I_D = 240A$



TO-263

• Ordering Information:

Part NO.	ZM012N03BC
Marking	ZM012N03
Packing Information	TUBE
Basic ordering unit (pcs)	500

• Absolute Maximum Ratings (T_C=25°C)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	20	V
Continuous Drain Current	$I_{D@TC=25^{\circ}C}$	240	A
	$I_{D@TC=75^{\circ}C}$	182	A
	$I_{D@TC=100^{\circ}C}$	151	A
Pulsed Drain Current ①	I_{DM}	720	A
Total Power Dissipation(TC=25°C)	$P_D@TC=25^{\circ}C$	150	W
Total Power Dissipation(TA=25°C)	$P_D@TA=25^{\circ}C$	3.1	W
Operating Junction Temperature	T_J	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Single Pulse Avalanche Energy	E_{AS}	1760	mJ

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R _{thJC}	-	-	0.8	° C/W
Thermal resistance, junction - ambient	R _{thJA}	-	-	40	° 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	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 =24A		1.1	1.4	mΩ
		V _{GS} =4.5V, I _D =12A		1.3	1.7	mΩ
Forward Transconductance	g _{FS}	V _{DS} =25V, I _D =10A		40		s
Source-drain voltage	V _{SD}	I _S =24A		0.8	1.28	V

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	f = 1MHz	-	7750	-	pF
Output capacitance	C _{oss}		-	930	-	
Reverse transfer capacitance	C _{rss}		-	240	-	

•Gate Charge characteristics(T_a = 25°C)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q _g	V _{DD} = 15V	-	125	-	nC
Gate - Source charge	Q _{gs}	I _D = 20A	-	16	-	
Gate - Drain charge	Q _{gd}	V _{GS} = 10V	-	25	-	

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

Fig.1 Power Dissipation

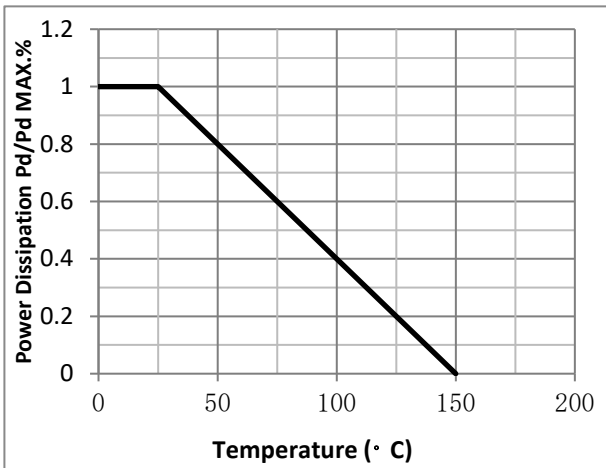


Fig.2 Typical output Characteristics

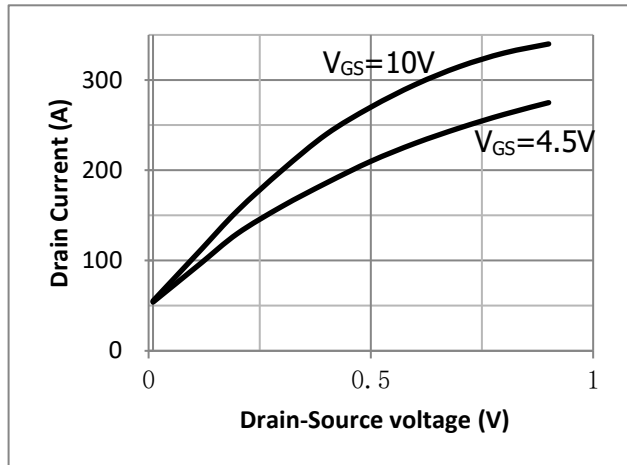


Fig.3 Threshold Voltage V.S Junction Temperature

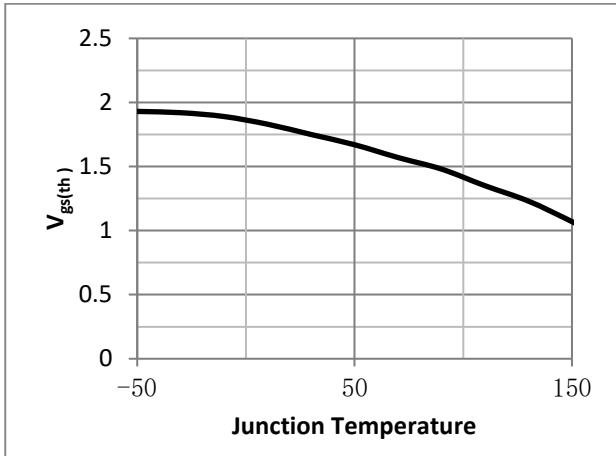


Fig.4 Resistance V.S Drain Current

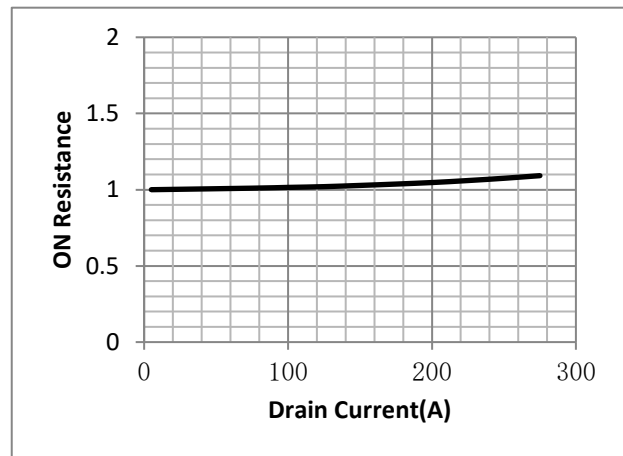


Fig.5 On-Resistance VS Gate Source Voltage

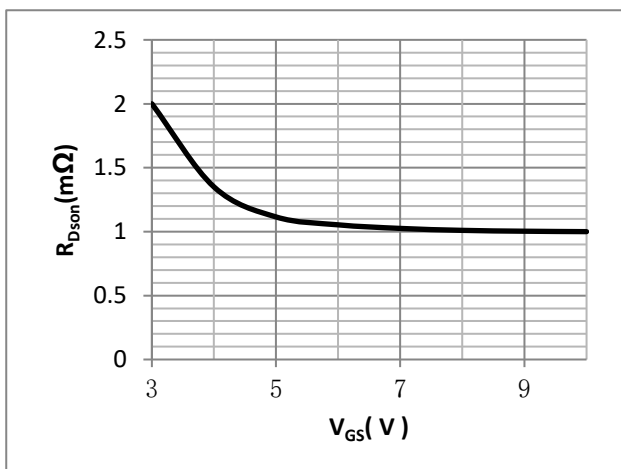


Fig.6 On-Resistance V.S Junction Temperature

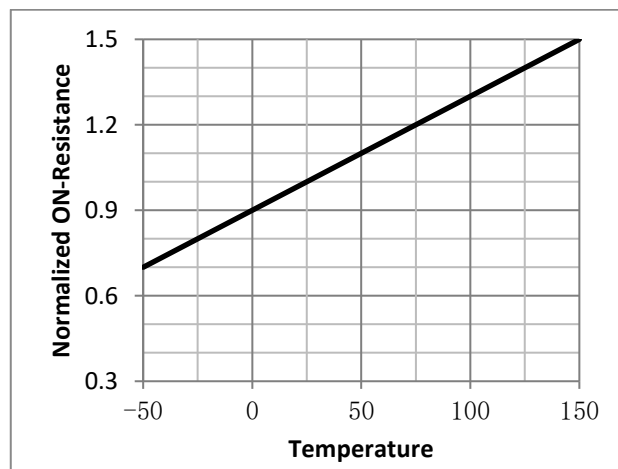


Fig.7 Gate Charge Characteristics

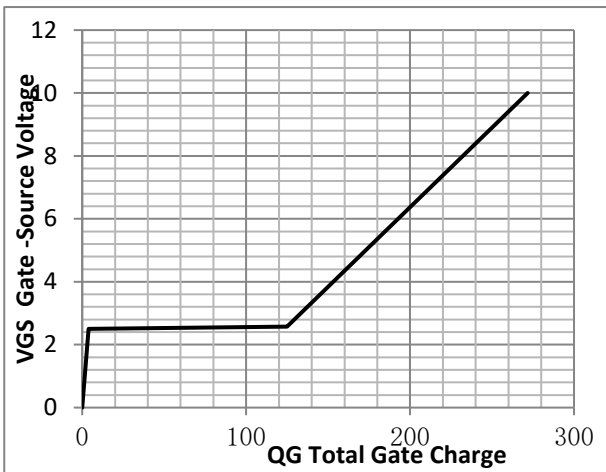


Fig.8 Capacitance vs Vds

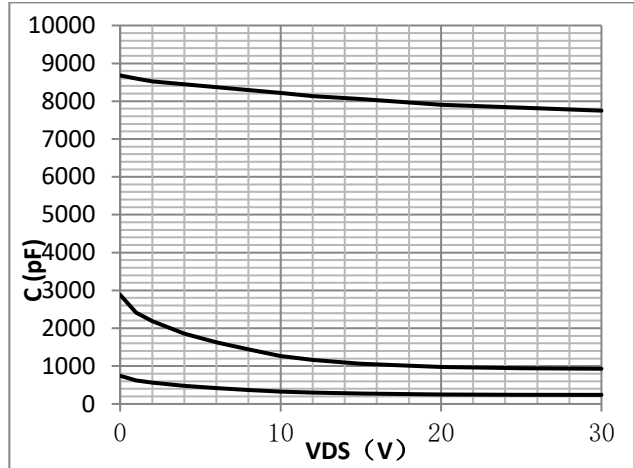


Fig.9 SOA Maximum Safe Operating Area

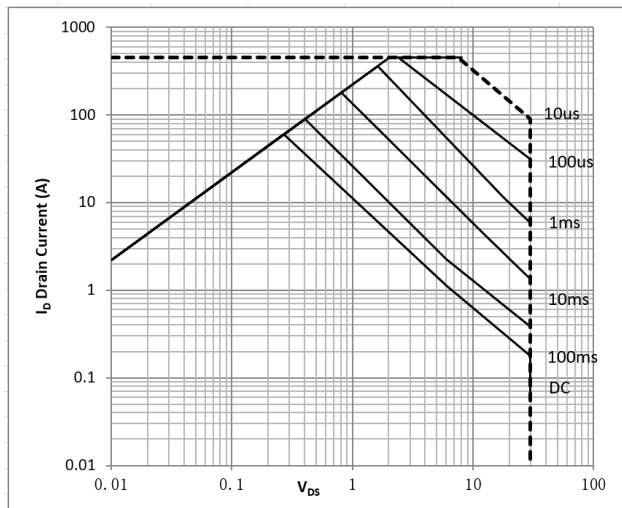


Fig.10 ID-Junction Temperature

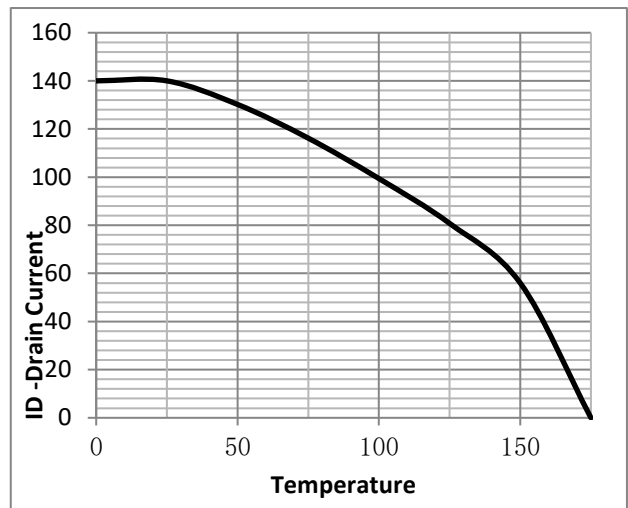


Fig.11 Switching Time Measurement Circuit

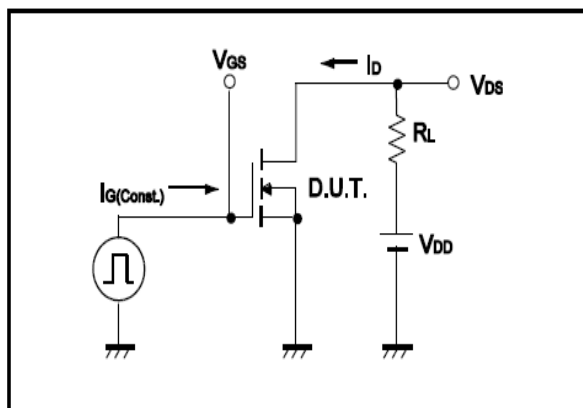


Fig.12 Gate Charge Waveform

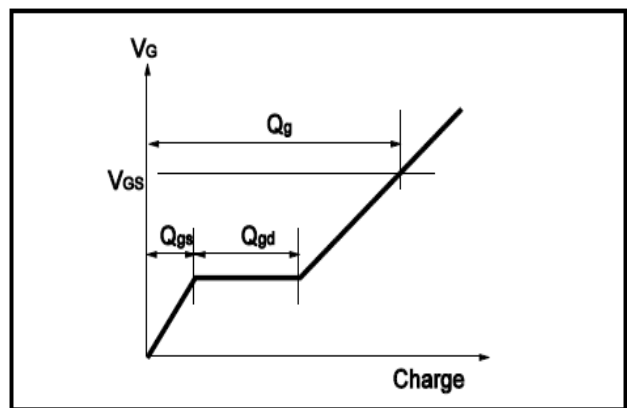


Fig.13 Resistive Switching Test Circuit

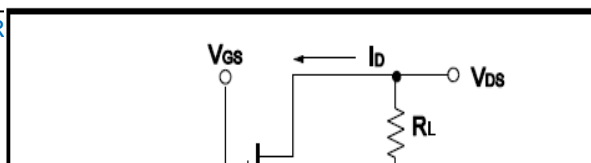


Fig.14 Resistive Switching Test Waveform

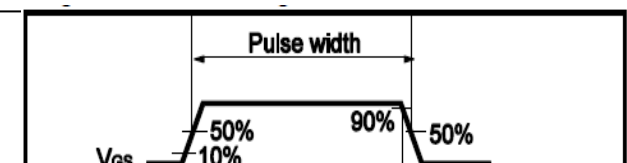


Fig.15 Avalanche Measurement Circuit

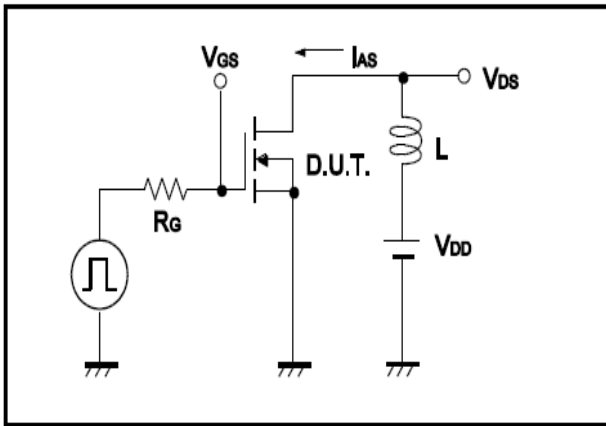
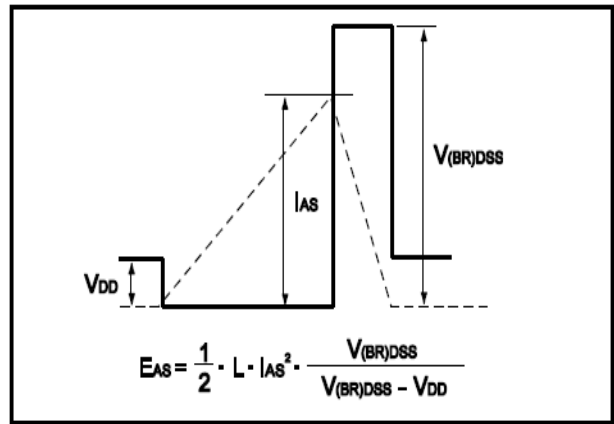


Fig.16 Avalanche Waveform





Unit: mm

SYMBOL	MIN	TYP	MAX	SYMBOL	MIN	TYP	MAX
A	4.42		4.72	E	8.99		9.29
B	1.22		1.32	e1	2.44		2.64
b	0.76		0.86	e2	4.98		5.18
b1	1.22		1.32	L1	15.19		15.79
b2	0.33		0.43	L2	2.29		2.79
C	1.22		1.32	L3	1.3		1.75
D	9.95		10.25				

