

• General Description

The ZM160P03D combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

• 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

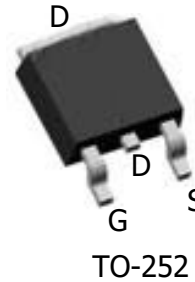
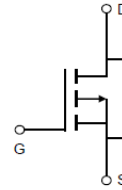
- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

• Product Summary

$V_{DS} = -30V$

$R_{DS(ON)} = 16m\Omega$

$I_D = -35A$


• Ordering Information:

Part NO.	ZM160P03D
Marking	ZM160P03
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

• 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	$I_D@TC=25^\circ C$	-35	A
	$I_D@TC=75^\circ C$	-26	A
	$I_D@TC=100^\circ C$	-22	A
Pulsed Drain Current ①	I_{DM}	-70	A
Total Power Dissipation(TC=25°C)	$P_D@TC=25^\circ C$	55	W
Total Power Dissipation(TA=25°C)	$P_D@TA=25^\circ C$	2.5	W
Operating Junction Temperature	T_J	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Single Pulse Avalanche Energy	E_{AS}	160	mJ

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R _{thJC}	-	-	2.1	° 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	-1.7	-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		16	21	mΩ
		V _{GS} =-4.5V, I _D =-10A		26	35	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-10V, I _D =-5A		6		s
Source-drain voltage	VSD	I _S =-20A			1.28	V

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C _{iss}	f = 1MHz	-	1450	-	pF
Output capacitance	C _{oss}		-	172	-	
Reverse transfer capacitance	C _{rss}		-	124	-	

•Switching Parameter(T_a = 25°C)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q _g	V _{DD} =-25V	-	14	-	nC
Gate - Source charge	Q _{gs}	I _D =-15A	-	6	-	
Gate - Drain charge	Q _{gd}	V _{GS} =-10V	-	5	-	
Turn-on Delay time	t _{D(on)}	V _{GS} =-10V, V _{DS} =-15V, R _L =1.8Ω, R _{GEN} =3Ω		8.8		ns
Turn-on Rise time	t _r			8.6		ns
Turn-off Delay time	t _{D(off)}			18.5		ns
Turn-off Fall time	t _f			7.3		ns

Body Diode Reverse Recovery Time	trr	$I_F = -8A,$ $dI/dt = 500A/us$	12.3	ns
Body Diode Reverse Recovery Charge	Qrr	$I_F = -8A,$ $dI/dt = 500A/us$	26.5	nC

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

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

Fig.1 Power Dissipation Derating Curve

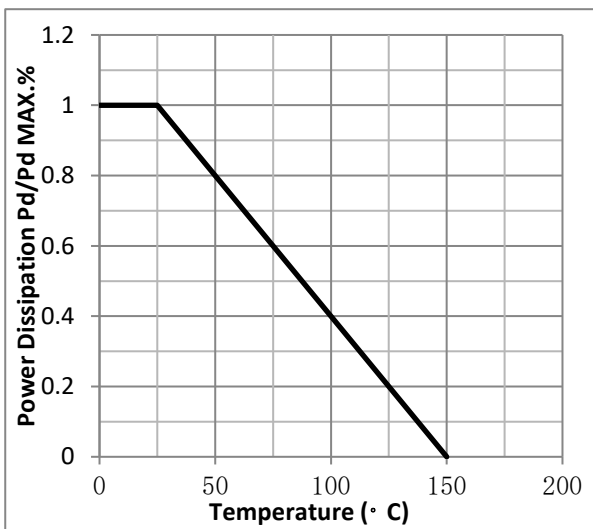


Fig.2 Typical output Characteristics

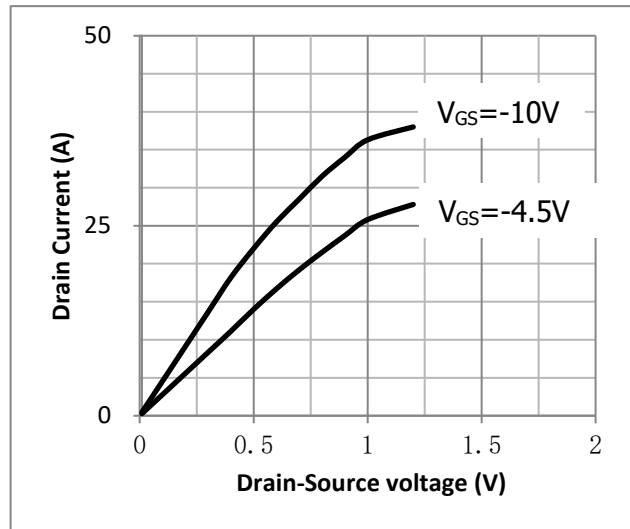


Fig.3 Threshold Voltage V.S Junction Temperature

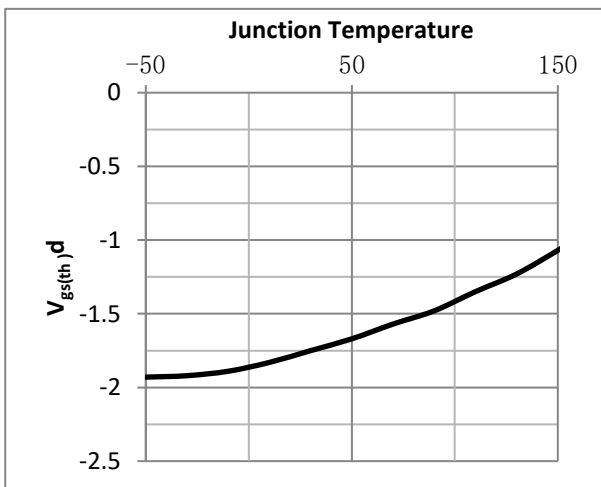


Fig.4 Resistance V.S Drain Current

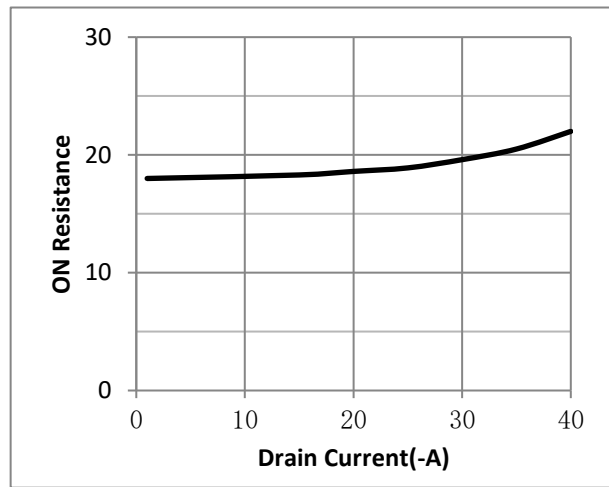


Fig.5 On-Resistance VS Gate Source Voltage

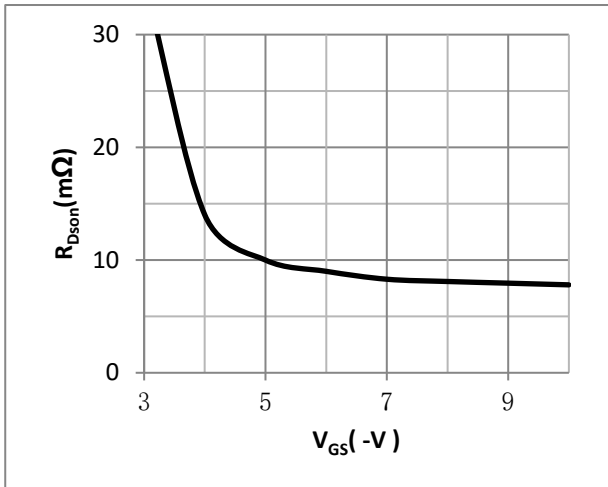


Fig.6 On-Resistance V.S Junction Temperature

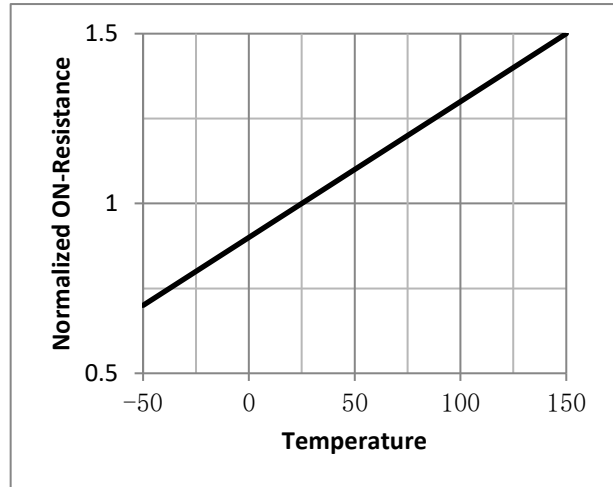


Fig.7 Switching Time Measurement Circuit

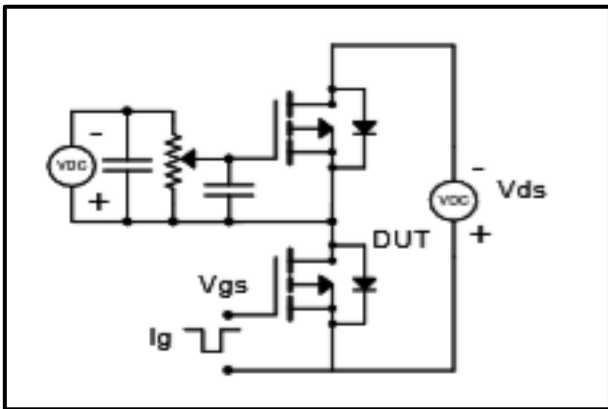


Fig.8 Gate Charge Waveform

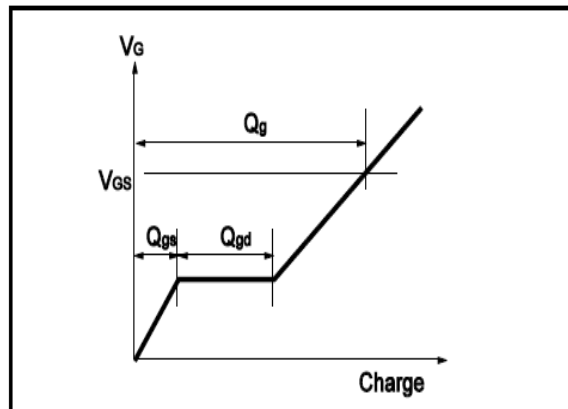


Fig.9 Switching Time Measurement Circuit

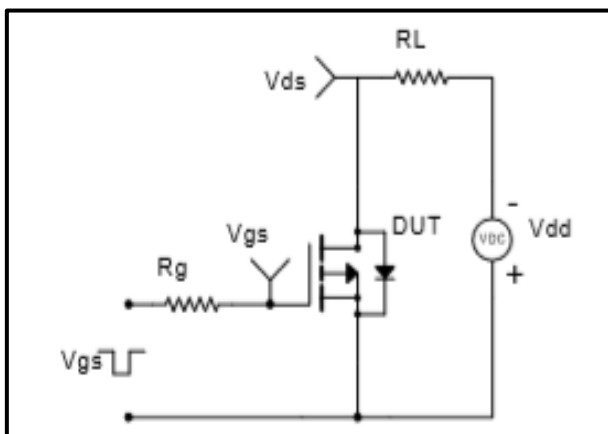


Fig.10 Gate Charge Waveform

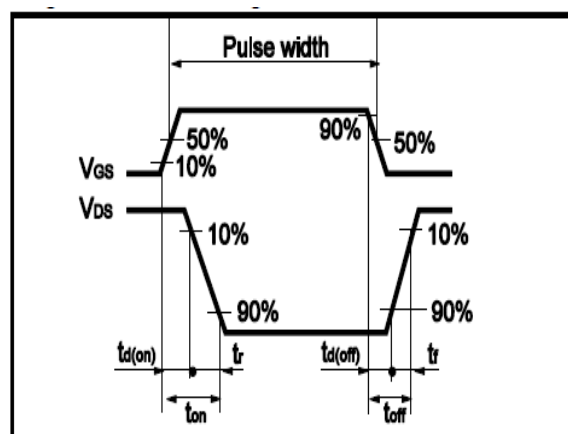


Fig.11 Avalanche Measurement Circuit

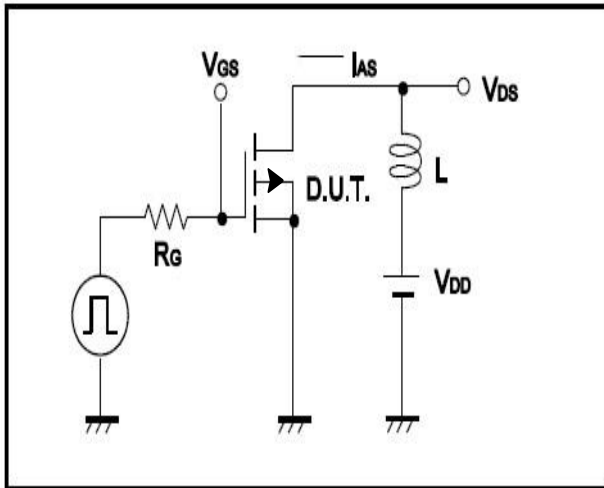
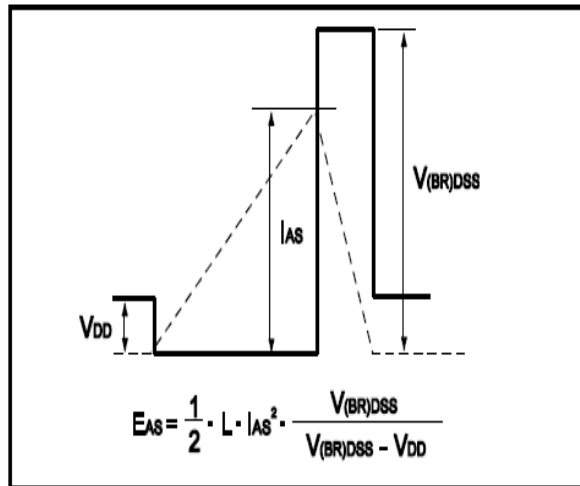


Fig.12 Avalanche Waveform



• Dimensions (TO-252)

Unit: mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	B	0.85	1.25
b	0.50	0.80	b1	0.50	0.90
b2	0.45	0.70	C	0.45	0.70
D	6.30	6.75	D1	5.10	5.50
E	5.30	6.30	e1	2.25	2.35
L1	9.20	10.60	e2	4.45	4.75
L2	0.90	1.75	L3	0.60	1.10
K	0.00	0.23			

