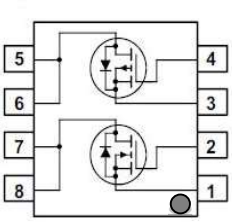
• General Description

The ZMC88302S combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. It combine one N Channel MOSFET and one P channel MOSFET.

• Product Summary



V_{DS1} =30V
V_{DS2} =-30V
$R_{DS(ON)1}$ =12mΩ
$R_{DS(ON)2}$ =18mΩ
I_{D1} =9A
I_{D2} =-7A

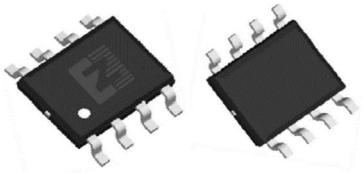
• Features

- ■ Advance high cell density Trench technology
- ■Low $R_{DS(ON)}$ to minimize conductive loss
- ■Low Gate Charge for fast switching
- ■ Dual DIE in one package

RoHS

•Application

- ■ Power Management in Notebook Computer
- ■ BLDC Motor driver



SOP8

•Ordering Information:

Part NO.	ZMC88302S
Marking	ZMC88302
Packing Information	REEL TAPE
Basic ordering unit (pcs)	4000

•N Channel Absolute Maximum Ratings (T_C =25℃)

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℃	9	A
	$I_{D@}$TC=75℃	6.8	A
	$I_{D@}$TC=100℃	5.7	A
Pulsed Drain Current ①	I_{DM}	20	A
Total Power Dissipation(TC=25℃)	P_D@TC=25℃	3.6	W
Total Power Dissipation(TA=25℃)	P_D@TA=25℃	0.69	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	45	mJ

●P Channel Absolute Maximum Ratings (T_C =25℃)

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℃	-7	A
	$I_{D@}$TC=75℃	-5.3	A
	$I_{D@}$TC=100℃	-4.4	A
Pulsed Drain Current ①	I_{DM}	-16	A
Total Power Dissipation(TC=25℃)	P_D@TC=25℃	3.6	W
Total Power Dissipation(TA=25℃)	P_D@TA=25℃	0.69	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	65	mJ

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	34	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	180	° C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	° C

●N Channel 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	1.6	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=6A		12	15	mΩ
		V_{GS}=4.5V, I_D=4A		19	22	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=5A		8		s
Source-drain voltage	V_{SD}	Is=6A			1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	VDS=25V f = 1MHz	-	560	-	pF
Output capacitance	C_{oss}		-	81	-	
Reverse transfer capacitance	C_{rss}		-	49	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	V_{DD} =15V I_D = 6A V_{GS} = 10V	-	10	-	nC
Gate - Source charge	Q_{gs}		-	1.6	-	
Gate - Drain charge	Q_{gd}		-	2.8	-	

●P Channel 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=-6A		18	22	mΩ
		V_{GS}=-4.5V, I_D=-4A		30	35	mΩ
Forward Transconductance	g_{FS}	V_{DS} =-10V, I_D=-5A		11		s
Source-drain voltage	V_{SD}	Is=-6A			1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	VDS=-25V f = 1MHz	-	1400	-	pF
Output capacitance	C_{oss}		-	125	-	
Reverse transfer capacitance	C_{rss}		-	110	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	V_{DD} = -15V I_D = -6A V_{GS} = -10V	-	26.1	-	nC
Gate - Source charge	Q_{gs}		-	4.9	-	
Gate - Drain charge	Q_{gd}		-	4	-	

●N Channel characteristics curve

Fig.1 Power Dissipation

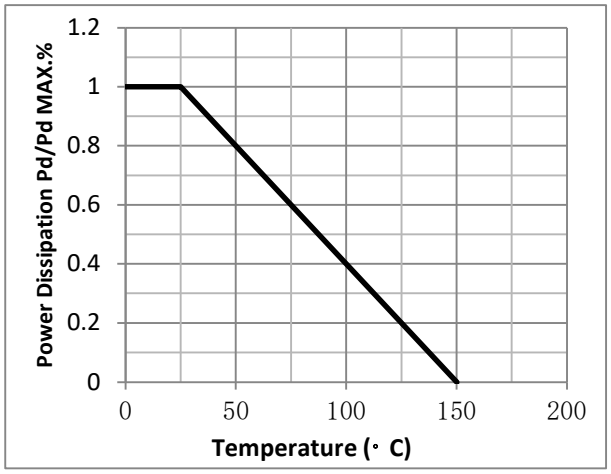


Fig.2 Typical output Characteristics

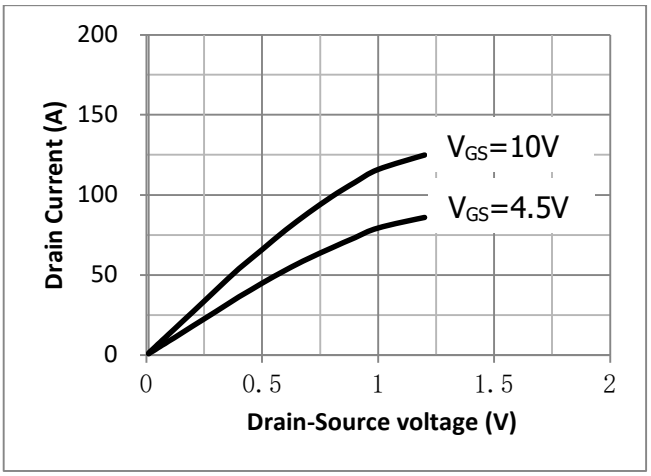


Fig.3 Threshold Voltage V.S Junction Temperature

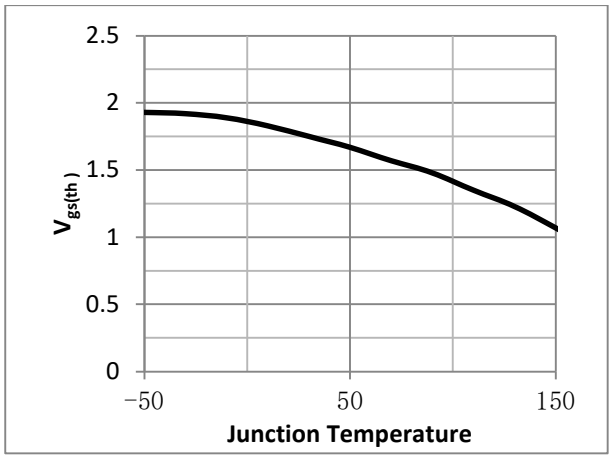


Fig.4 Resistance V.S Drain Current

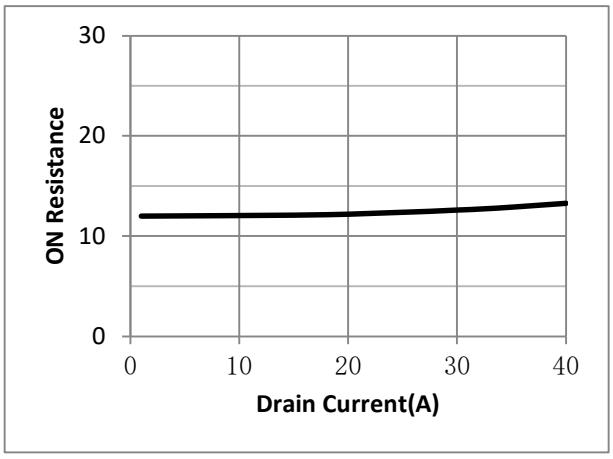


Fig.5 On-Resistance VS Gate Source Voltage

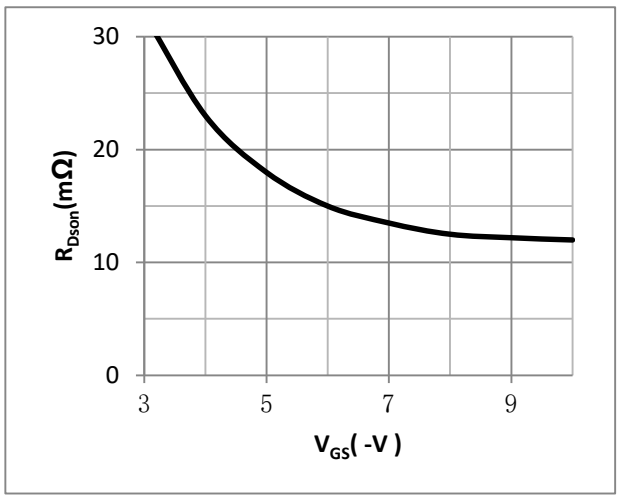
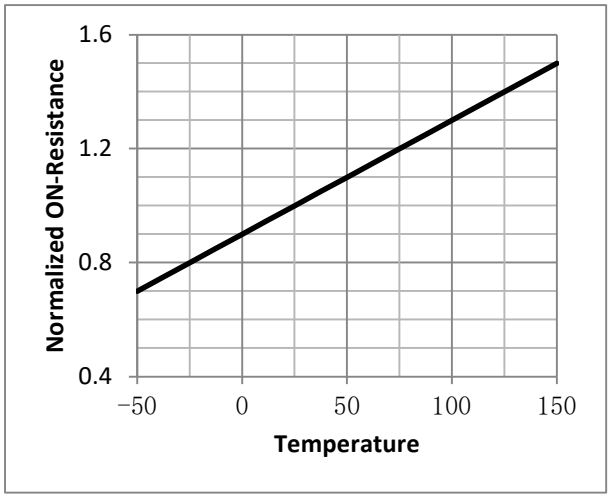


Fig.6 On-Resistance V.S Junction Temperature



●P Channel characteristics curve

Fig.1 Power Dissipation Derating Curve

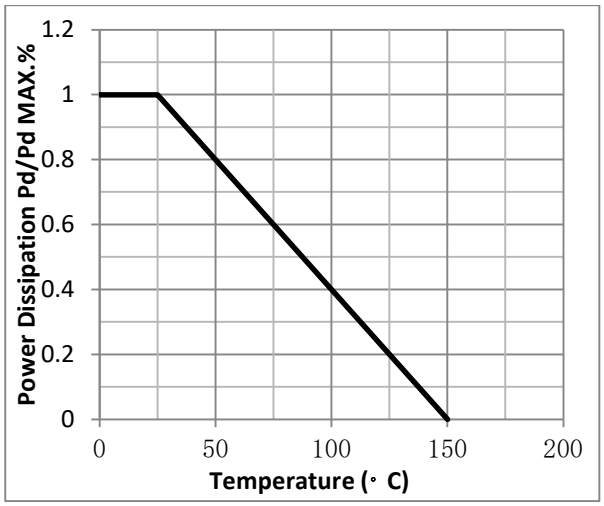


Fig.2 Typical output Characteristics

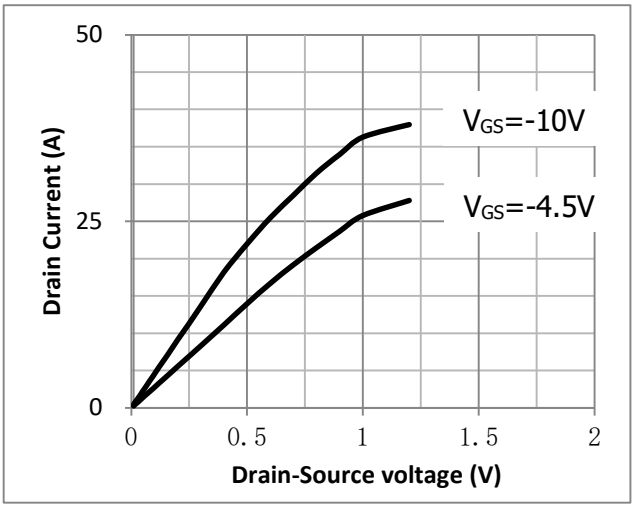


Fig.3 Threshold Voltage V.S Junction Temperature

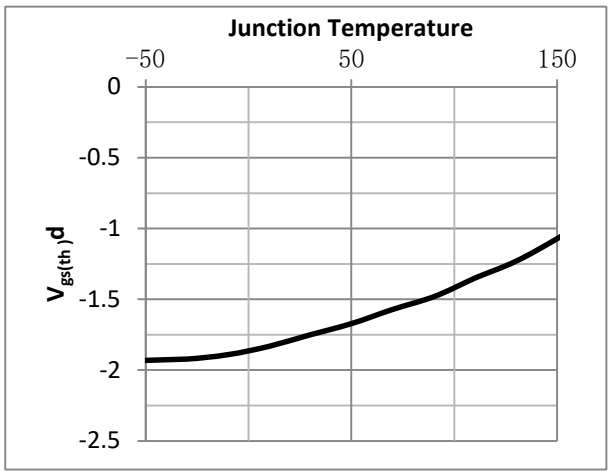


Fig.4 Resistance V.S Drain Current

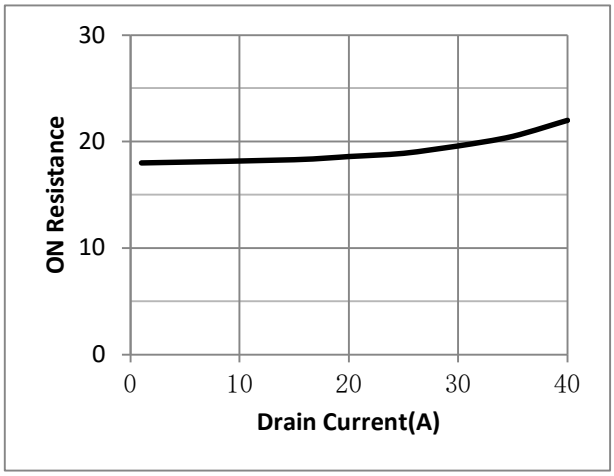


Fig.5 On-Resistance VS Gate Source Voltage

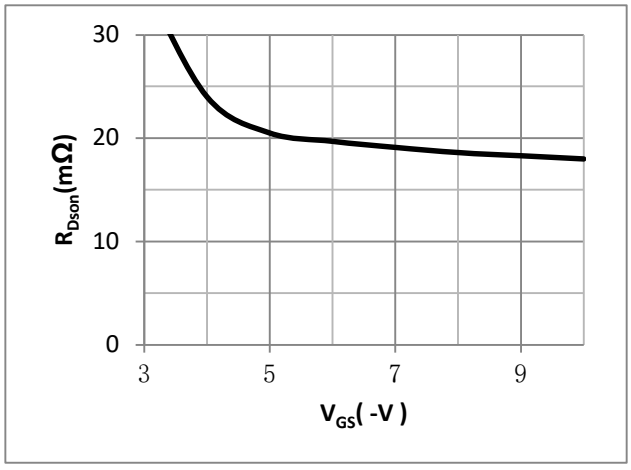
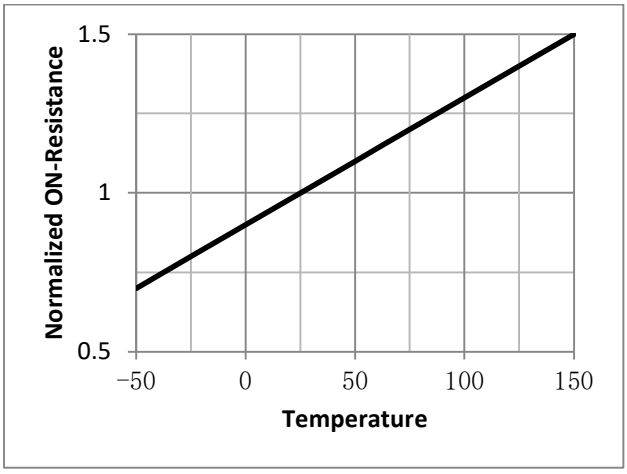


Fig.6 On-Resistance V.S Junction Temperature



●Test Circuit CHANNEL-N

Fig.1 Gate Charge Measurement Circuit

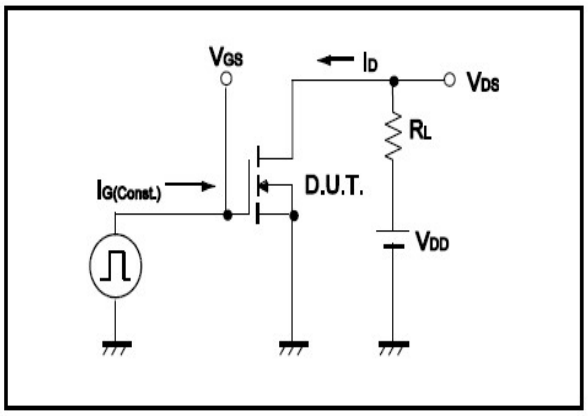


Fig.2 Gate Charge Waveform

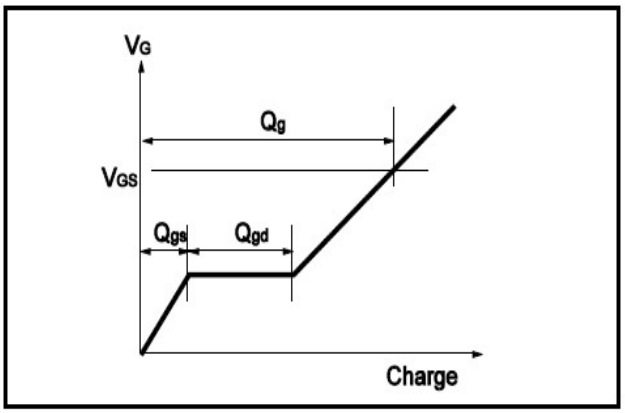


Fig.3 Switching Time Measurement Circuit

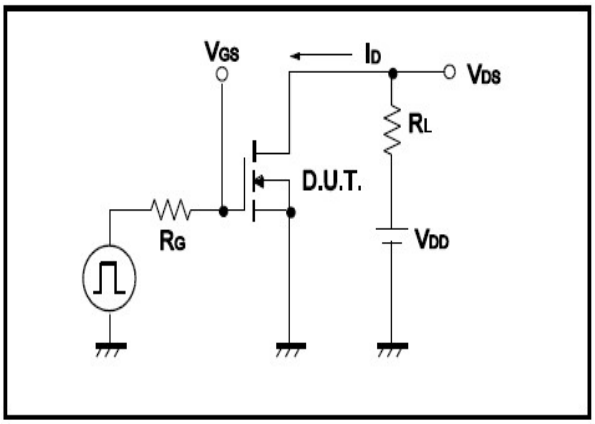


Fig.4 Switching Time Waveform

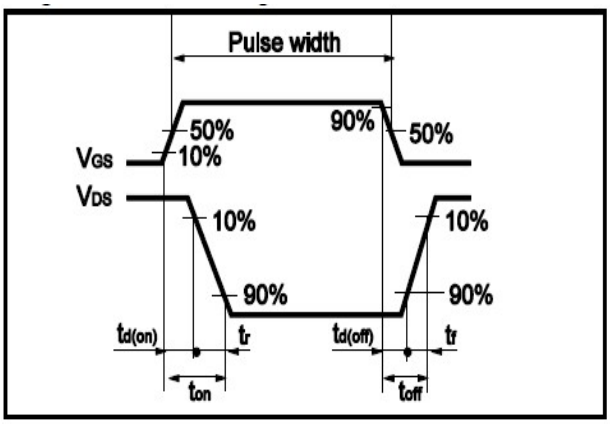


Fig.5 Avalanche Measurement Circuit

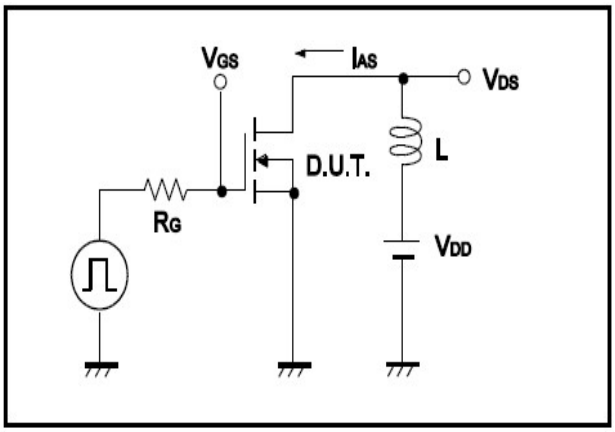
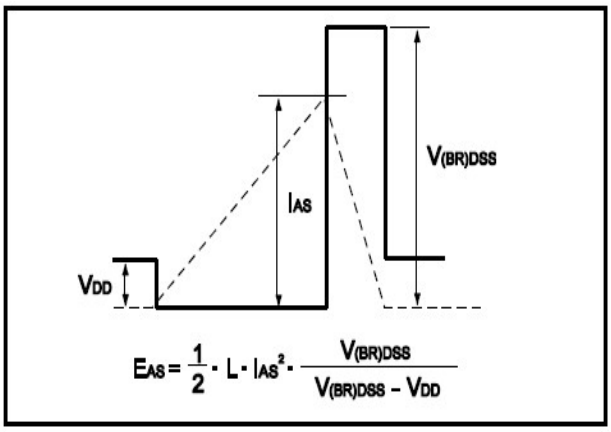


Fig.6 Avalanche Waveform



●Test Circuit CHANNEL-P

Fig.7 Gate Charge Measurement Circuit

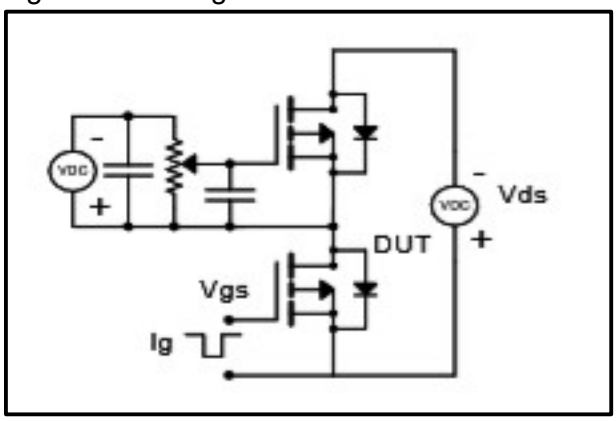


Fig.8 Gate Charge Waveform

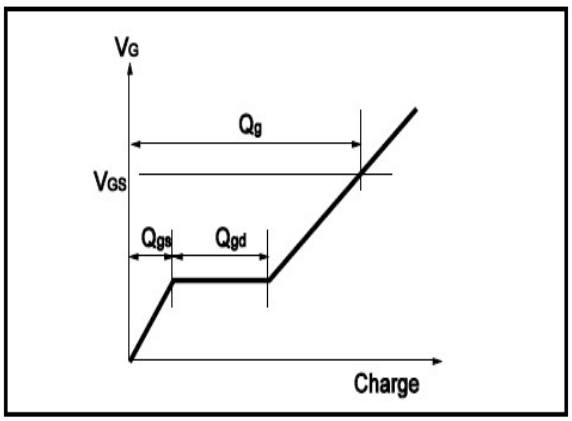


Fig.9 Switching Time Measurement Circuit

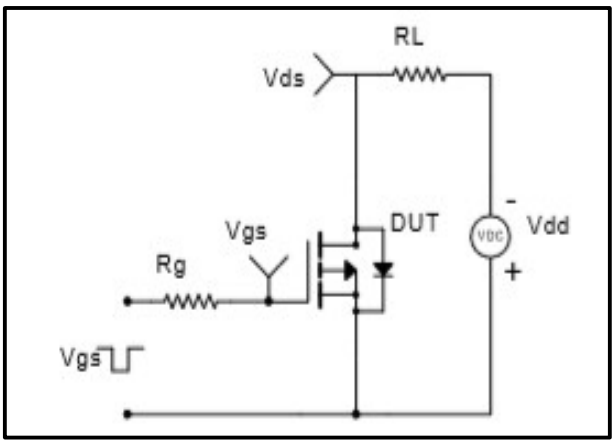


Fig.10 Switching Time Waveform

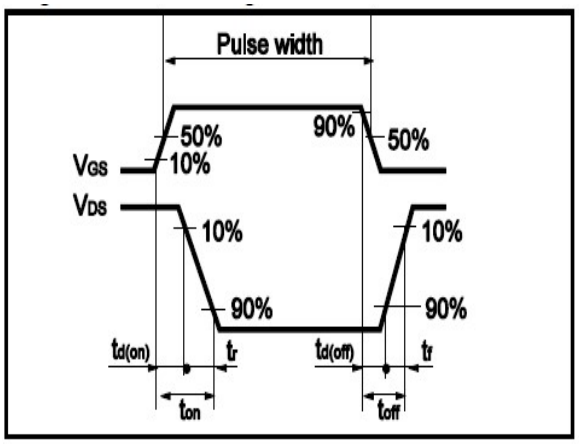


Fig.11 Avalanche Measurement Circuit

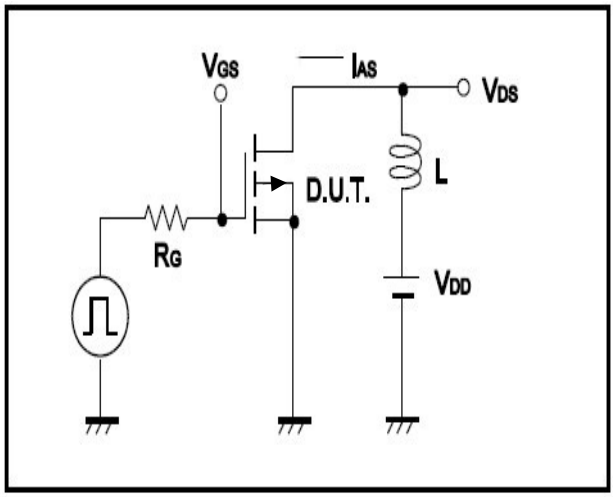
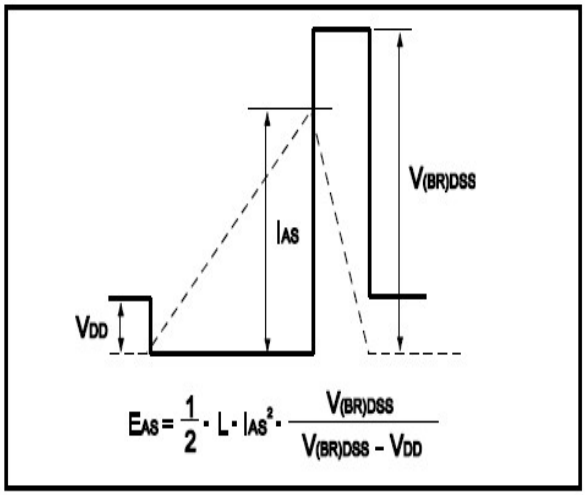


Fig.12 Avalanche Waveform



●Dimensions(SOP8)

Unit: mm

SYMBOL	min	TYP	max	SYMBOL	min		max
A	4.80		5.00	C	1.30		1.50
A1	0.37		0.47	C1	0.55		0.75
A2		1.27		C2	0.55		0.65
A3		0.41		C3	0.05		0.20
B	5.80		6.20	C4	0.19	0.20	0.23
B1	3.80		4.00	D		1.05	
B2		5.00		D1	0.40		0.62