● General Description

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

■Wettable Flanks

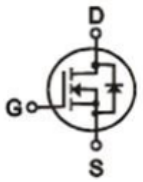
●Application

■MB/VGA Vcore

■SMPS 2nd Synchronous Rectifier

■BLDC Motor driver

● Product Summary

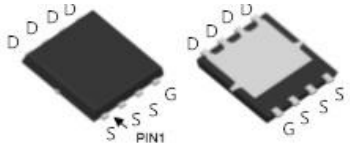


V_{DS} =30V

$R_{DS(ON)}$ =3.5mΩ

I_D =77A

RoHS



DFN5 x 6

●Ordering Information:

Part NO.	ZMS030N03N
Marking	ZMS030N03
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

●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	$I_{D@}T_C$=25℃	77	A
	$I_{D@}T_C$=75℃	58	A
	I_{D} @T_C=100℃	48	A
	$I_{D@}T_A$=25℃	25	A
	$I_{D@}T_A$=70℃	20	A
Pulsed Drain Current ①	I_{DM}	231	A
Total Power Dissipation	P_D@T_C=25℃	40	W
Total Power Dissipation	P_D@T_A=25℃	2.5	W
Operating Junction Temperature	T_J	-55 to 175	℃
Storage Temperature	T_{STG}	-55 to 175	℃

Single Pulse Avalanche Energy (L=0.5mH,VGS=10V,Rg=25Ω,TJ=25℃)	E_{AS}	170	mJ
Single Pulse Avalanche Energy (L=0.1mH,VGS=10V,Rg=25Ω,TJ=25℃)	E_{AS}	80	mJ

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	3.1	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	50	° C/W
Soldering temperature, wave soldering for 10s	T_{sold}	-	-	260	° 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	1.5		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		3.5	4.2	mΩ
		V_{GS}=4.5V, I_D=12A		5.0	6.5	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A		10		s
Source-drain voltage	V_{SD}	Is=24A			1.28	V

●Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz, V_{DS}=25V	-	1530	-	pF
Output capacitance	Coss		-	378	-	
Reverse transfer capacitance	Crss		-	19	-	
Gate Risistance	R_g	f = 1MHz		2.2		Ω
Total gate charge	Qg	V_{DD} = 15V, I_D = 20A, V_{GS} = 10V	-	29	-	nC
Total gate charge	Qg (4.5V)		-	16	-	
Gate - Source charge	Qgs		-	3.4	-	

Gate - Drain charge	Qgd		-	7.4	-	
Turn-ON Delay time	$t_{D(on)}$	V_{GS}=10V,V_{DS}=15V R_G =6Ω, I_D =30A		6.5		ns
Turn-ON Rise time	t_r			3.5		ns
Turn-Off Delay time	$t_{D(off)}$			26		ns
Turn-Off Fall time	t_f			4.5		ns
Reverse Recovery Time	t_{RR}	V_{DD} = 20 V, dI_S/dt = 100 A/s, I_S = 30 A		17		ns
Reverse Recovery Charge	Q_{RR}			26		nC

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

Fig.1 Power Dissipation

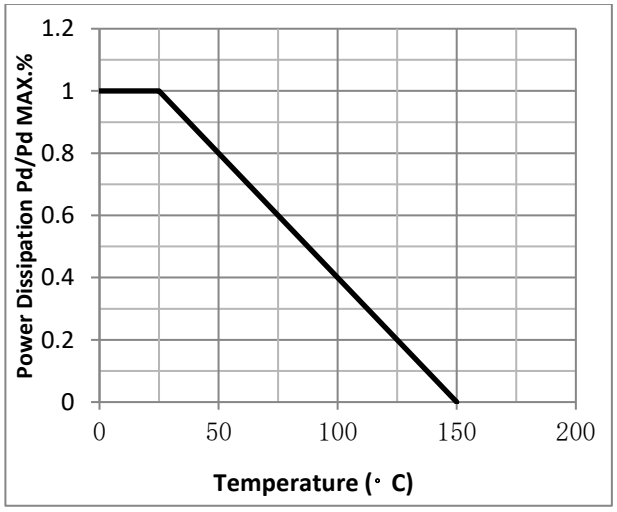


Fig.2 Typical output Characteristics

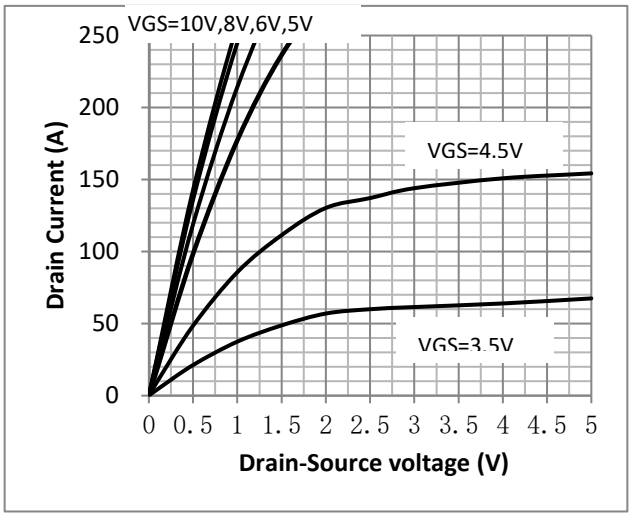


Fig.3 Threshold Voltage V.S Junction Temperature

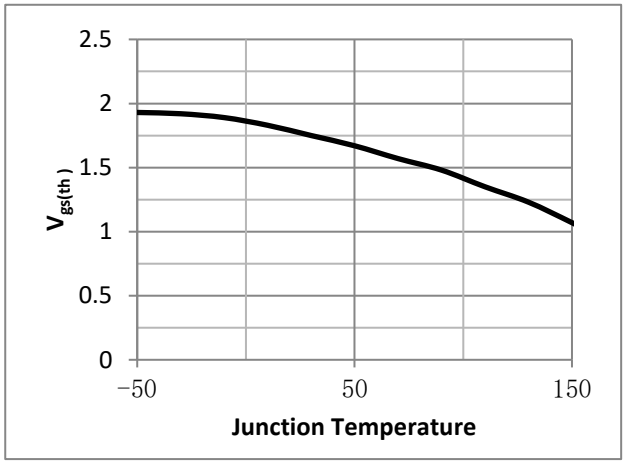


Fig.4 Resistance V.S Drain Current

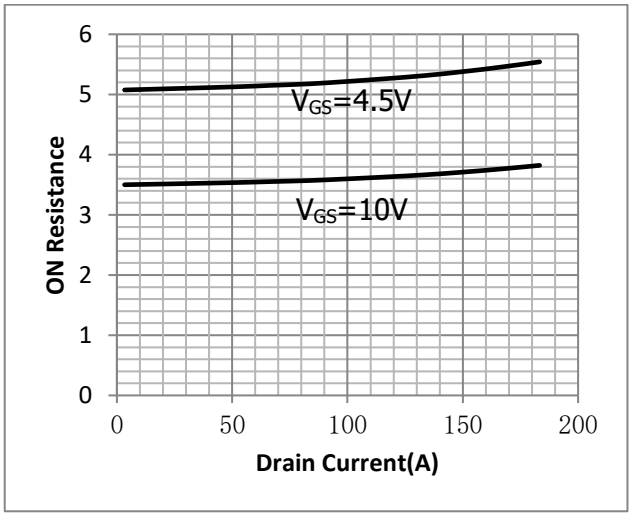


Fig.5 On-Resistance VS Gate Source Voltage

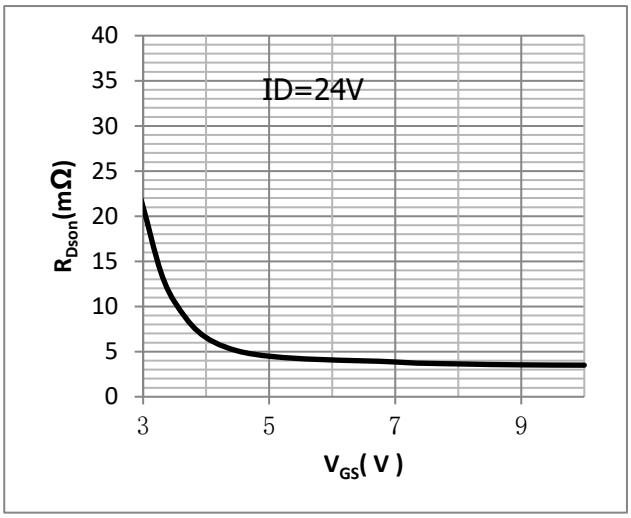


Fig.6 On-Resistance V.S Junction Temperature

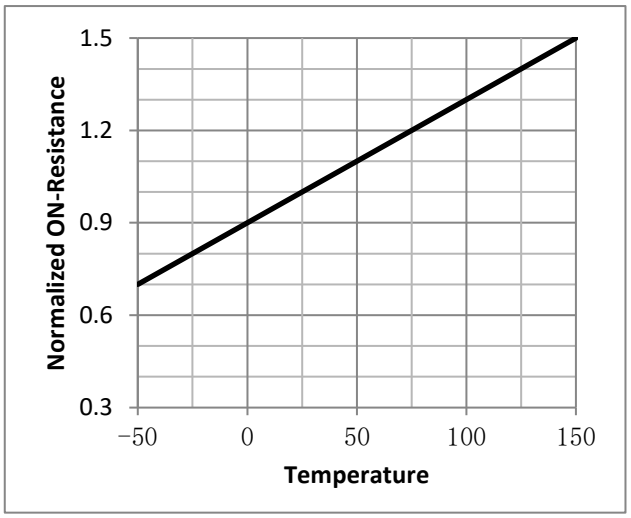


Fig.7 SOA Maximum Safe Operating Area

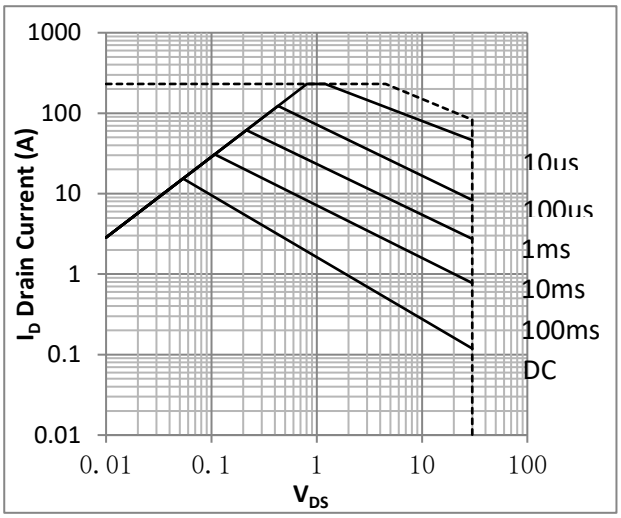


Fig.8 ID-Junction Temperature

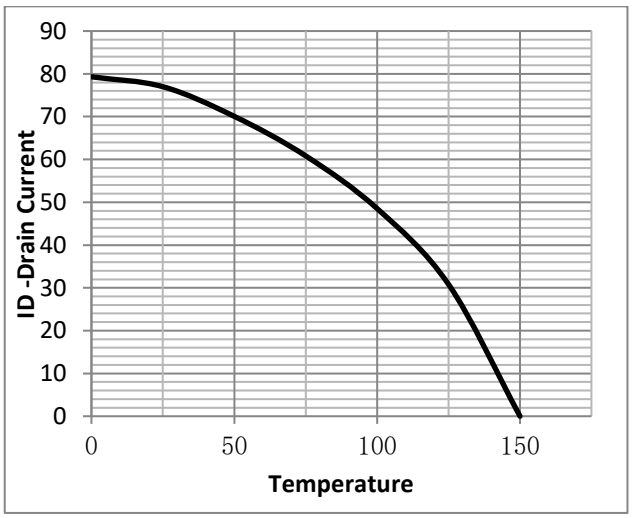


Figure 9. Diode Forward Voltage vs. Current

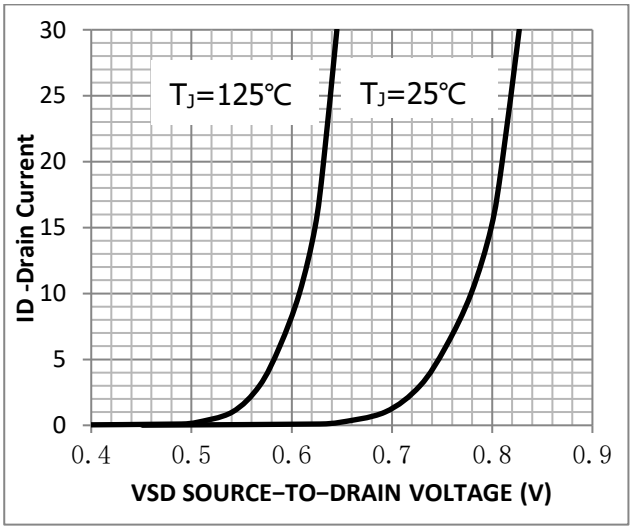


Figure 10. Transfer Characteristics

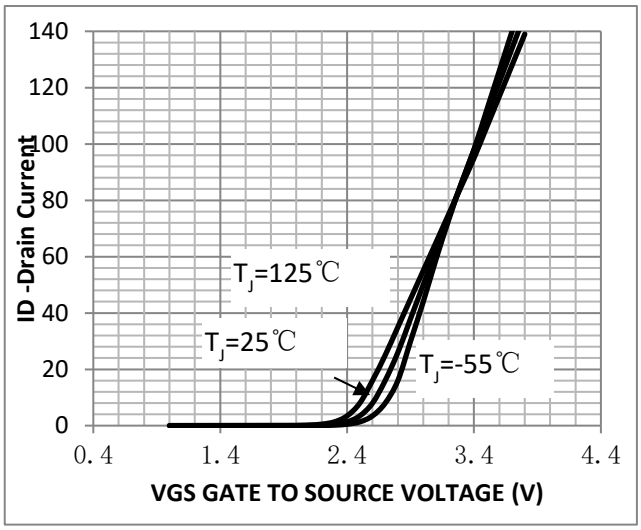


Figure 11. Gate–to–Source and Drain–to–Source Voltage vs. Total Charge

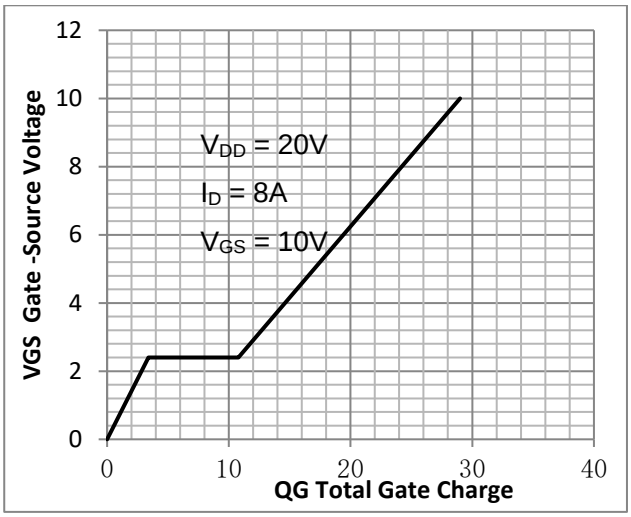


Fig.12 Capacitance Variation

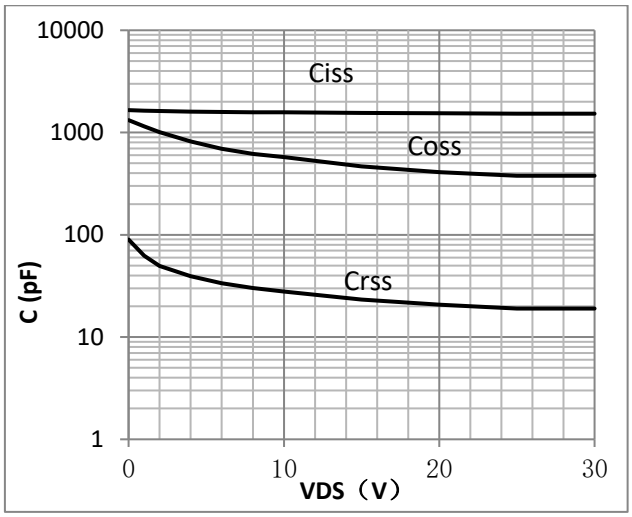


Fig.13 Normalized Maximum Transient Thermal Impedance

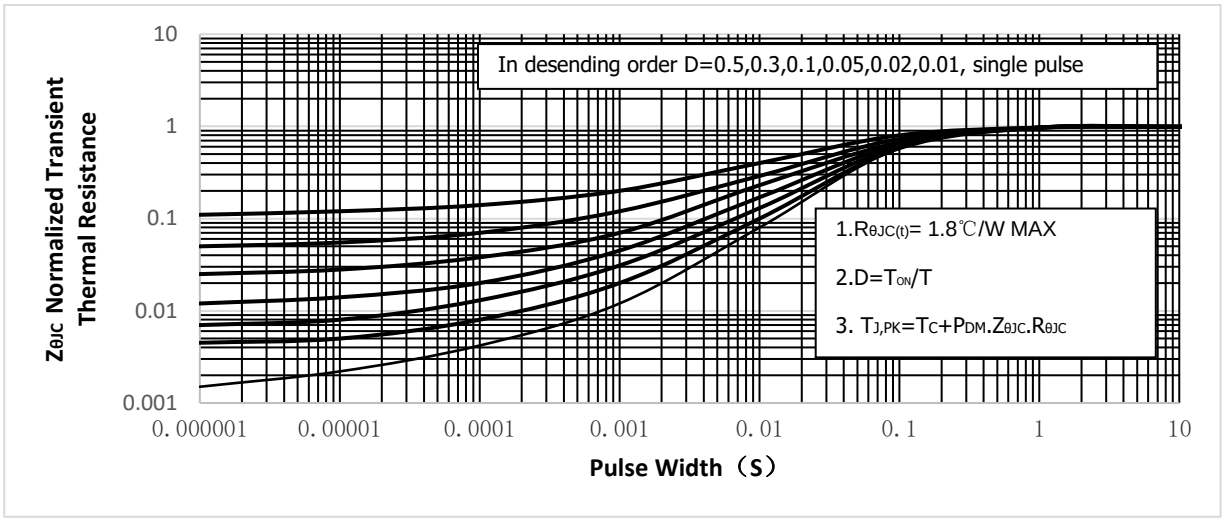


Fig.14 Switching Time Measurement Circuit

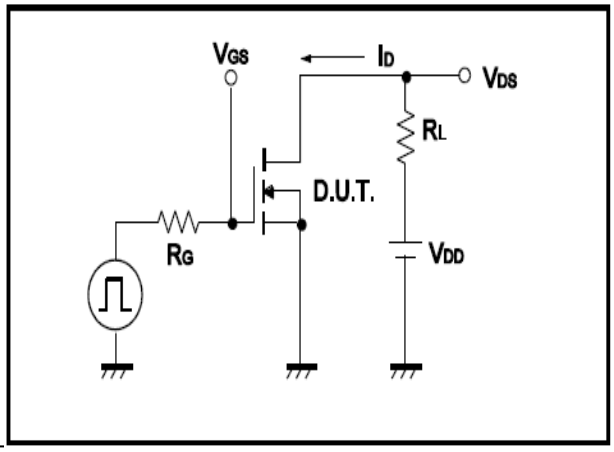


Fig.15 Gate Charge Waveform

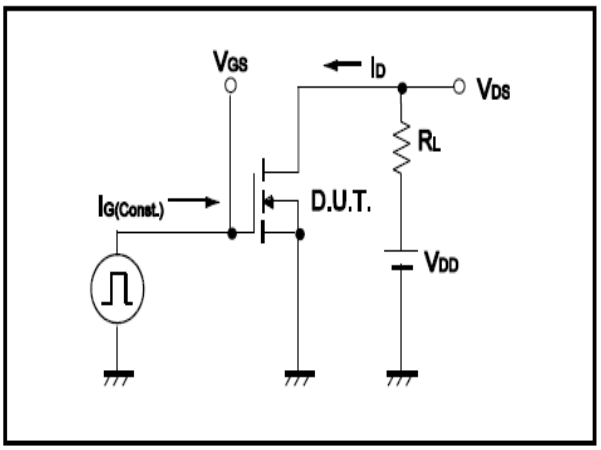


Fig.16 Avalanche Measurement Circuit

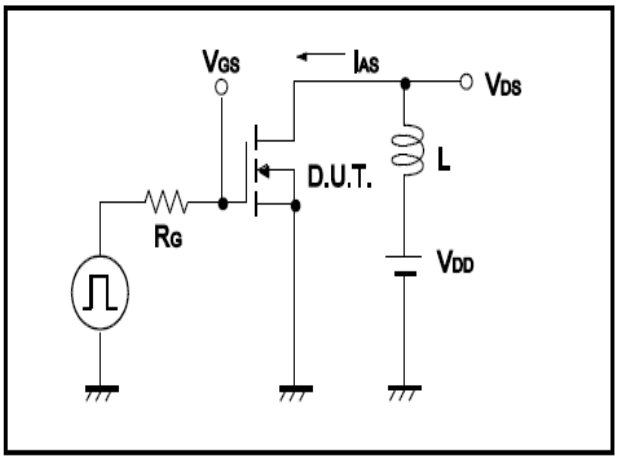


Fig.17 Avalanche Waveform

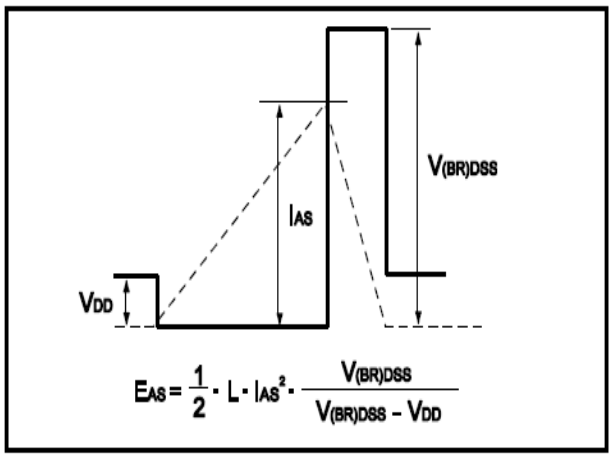
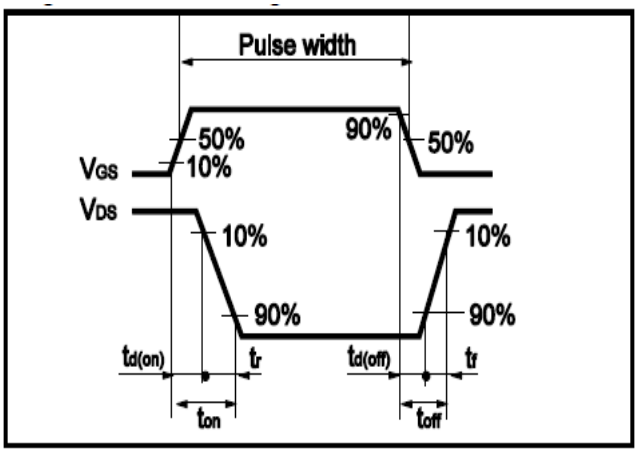
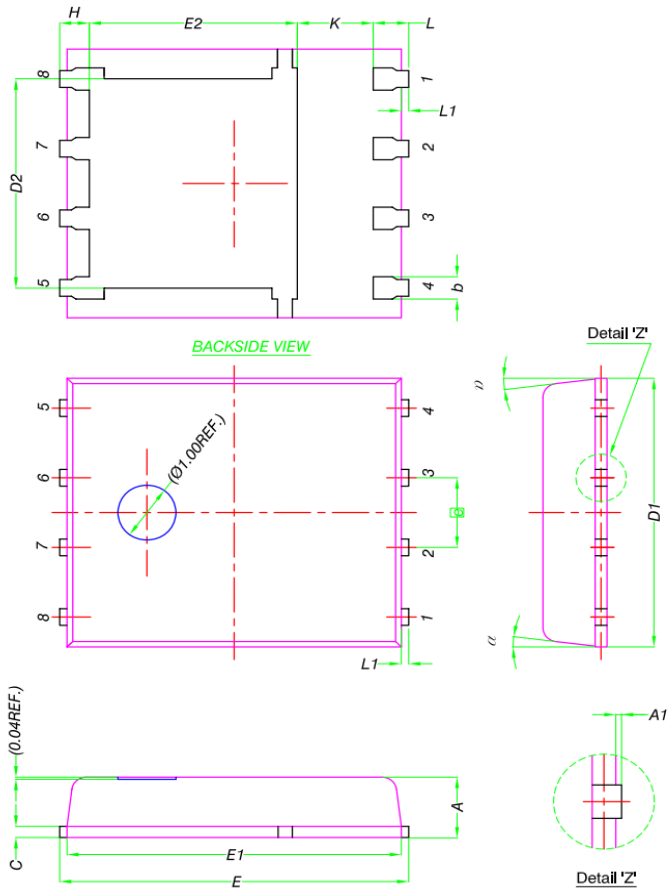


Fig.18 Gate Charge Waveform



●Dimensions（DFN5×6）

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°