● 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 This device is ideal for motor driver, load switch and DC-DC applications.

● Features

■Advance Trench technology

■Low $R_{DS(ON)}$ to minimize conductive loss

■Low Gate Charge for fast switching

■Low Thermal resistance

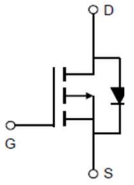
●Application

■BLDC Motor driver

■Load Switch

■DC-DC

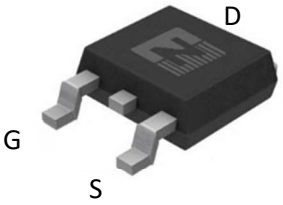
● Product Summary



V_{DS}=-40V

$R_{DS(ON)}$ =6.8mΩ

I_D=-55A



TO-252

●Ordering Information:

Part NO.	ZM060P04D
Marking	ZM060P04
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

●Absolute Maximum Ratings (T_C =25℃)

Parameter	**Symbol**	Rating	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	±25	V
Continuous Drain Current	I_D@T_C=25℃	-55	A
	I_D@T_C=75℃	-41	A
	I_D@T_C=100℃	-34	A
Pulsed Drain Current ①	I_{DM}	-165	A
Total Power Dissipation	P_D@T_C=25℃	60	W
Total Power Dissipation	P_D@T_A=25℃	2.0	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	180	mJ
ESD Level (HBM)		Class 2	

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	2.0	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	62.5	° C/W
Soldering temperature, wavesoldering 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	-40			V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS}, I_D =-250uA	-1.3		-2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-40V, 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=-40A		6.8	8.8	mΩ
		V_{GS}=-4.5V, I_D=-25A		9.5	12	mΩ
Forward Transconductance	g_{FS}	V_{DS} =-10V, I_D=-10A		28		s
Source-drain voltage	V_{SD}	Is=40A			1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz V_{DS}=-25V	-	6210	-	pF
Output capacitance	Coss		-	468	-	
Reverse transfer capacitance	Crss		-	397	-	

●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Qg	V_{DD} = -25V I_D = -5A V_{GS} = -10V	-	106	-	nC
Gate - Source charge	Qgs		-	13	-	
Gate - Drain charge	Qgd		-	20	-	

Fig.1 Power Dissipation Derating Curve

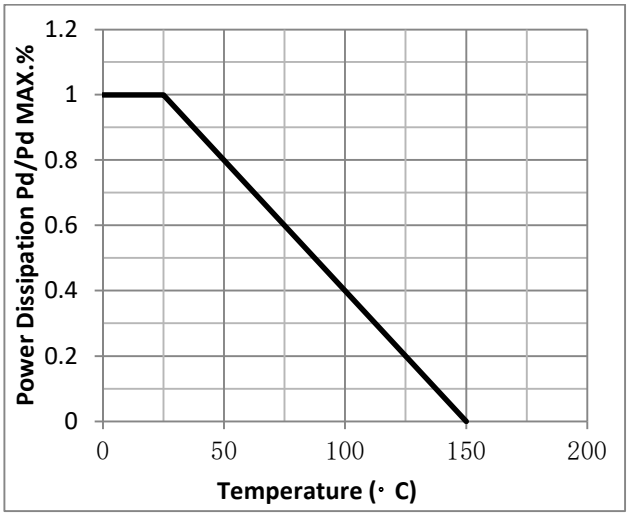


Fig.2 Typical output Characteristics

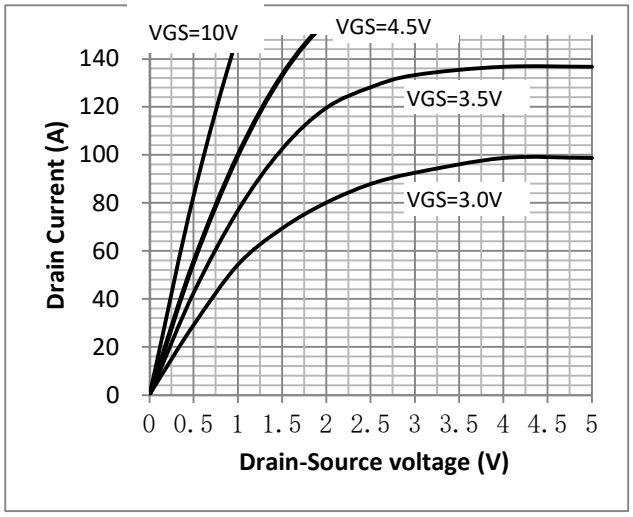


Fig.3 Threshold Voltage V.S Junction Temperature

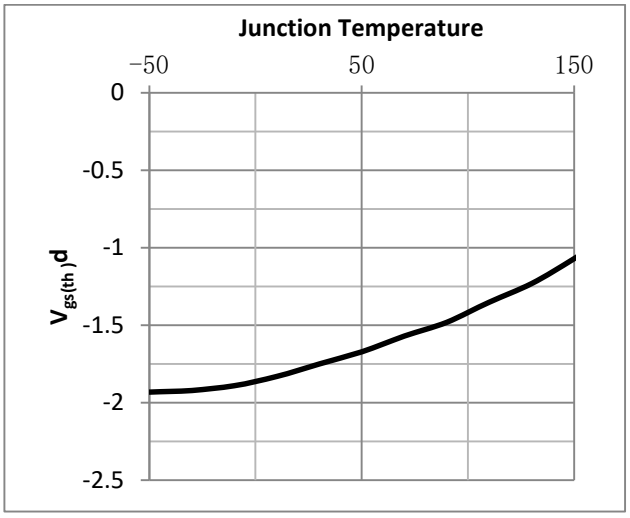


Fig.4 Resistance V.S Drain Current

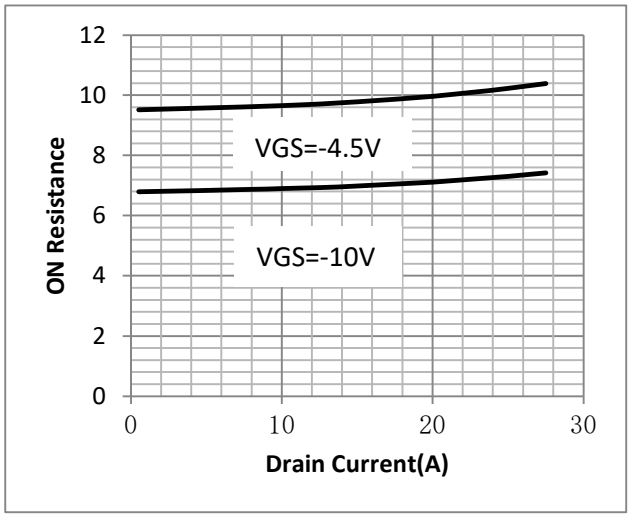


Fig.5 On-Resistance VS Gate Source Voltage

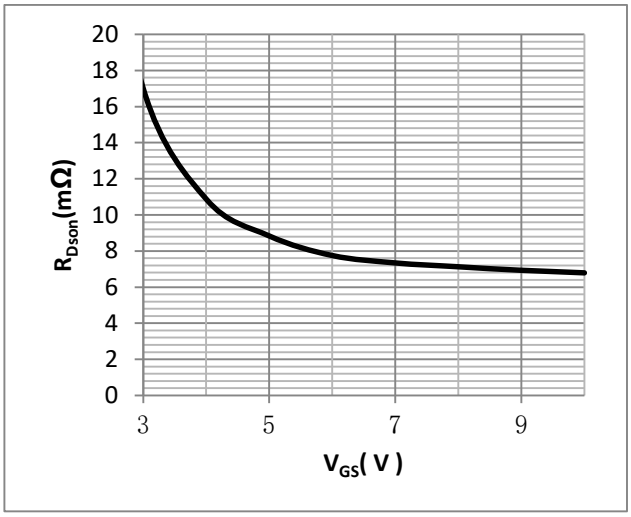


Fig.6 On-Resistance V.S Junction Temperature

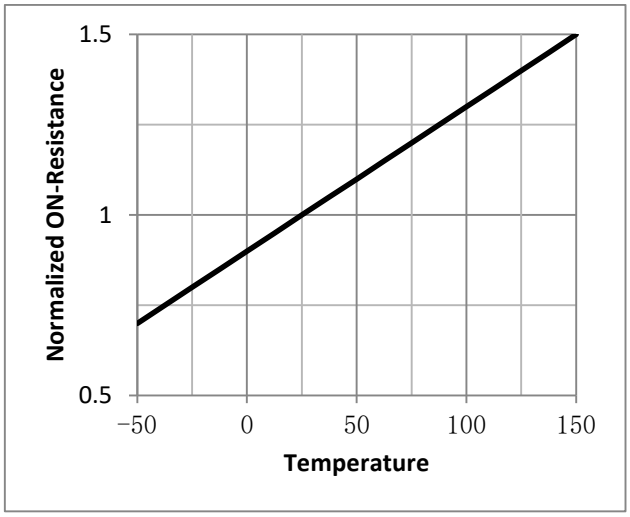


Fig.7 SOA Maximum Safe Operating Area

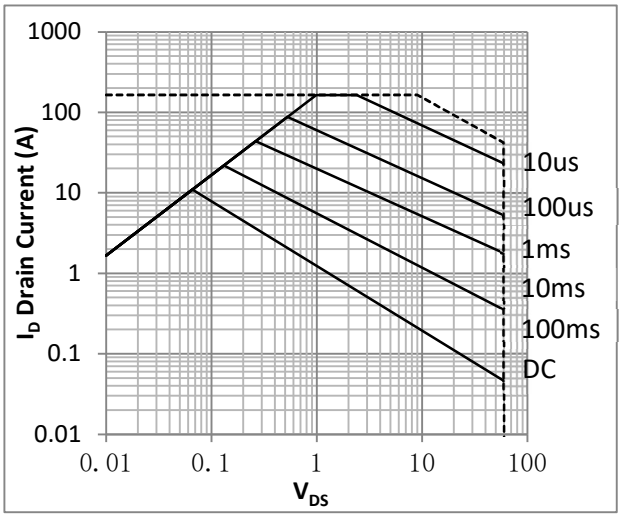


Fig.8 ID-Junction Temperature

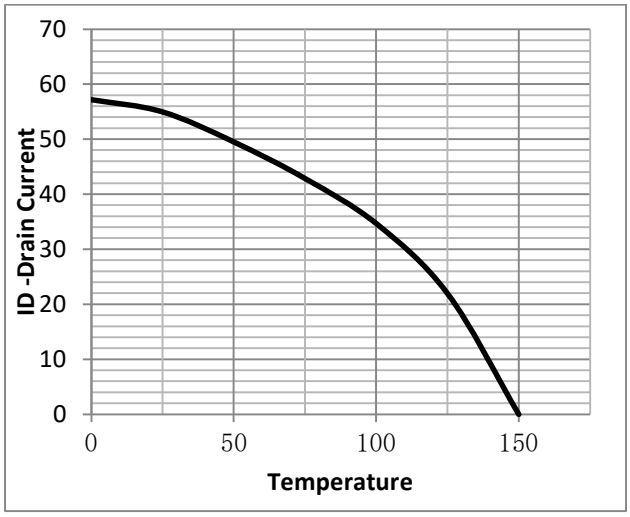


Figure.9 Diode Forward Voltage vs. Current

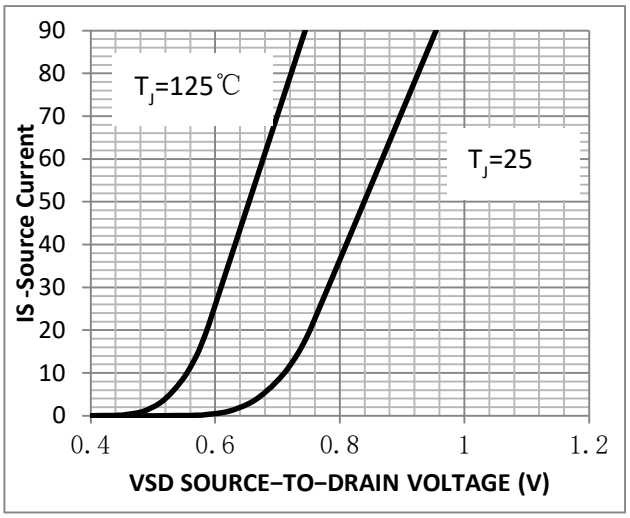


Figure.10 Transfer Characteristics

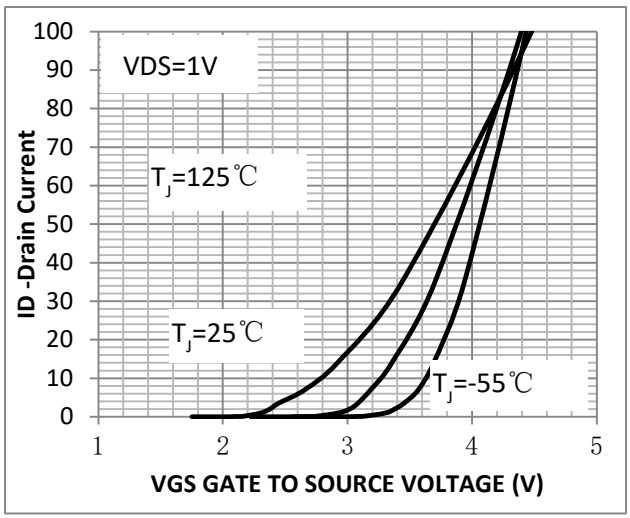


Fig.11 Gate Charge Characteristics

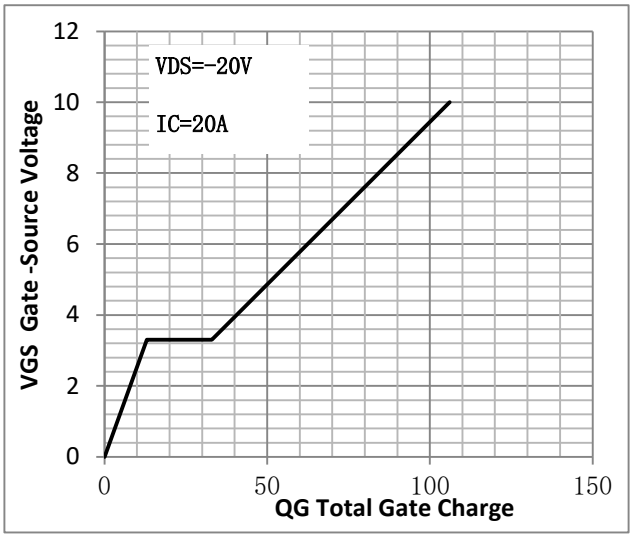


Fig.12 Capacitance vs Vds

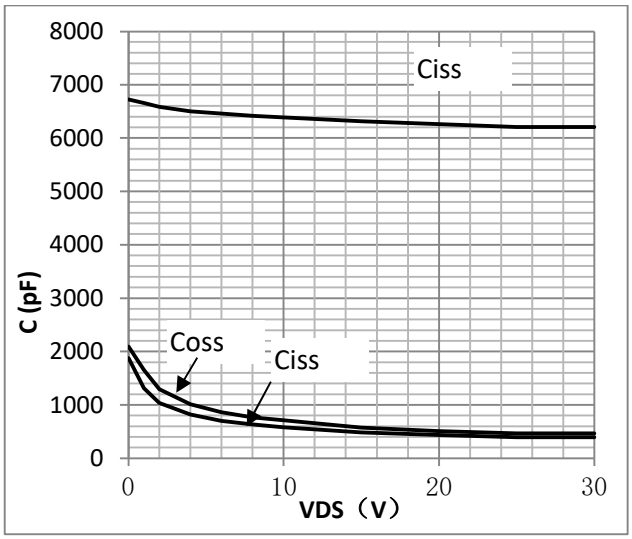


Fig.13 Switching Time Measurement Circuit

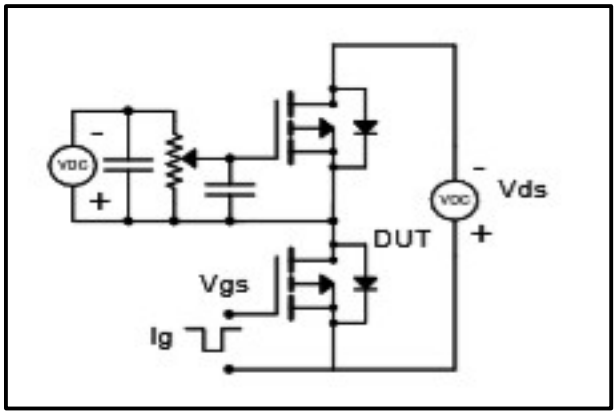


Fig.14 Gate Charge Waveform

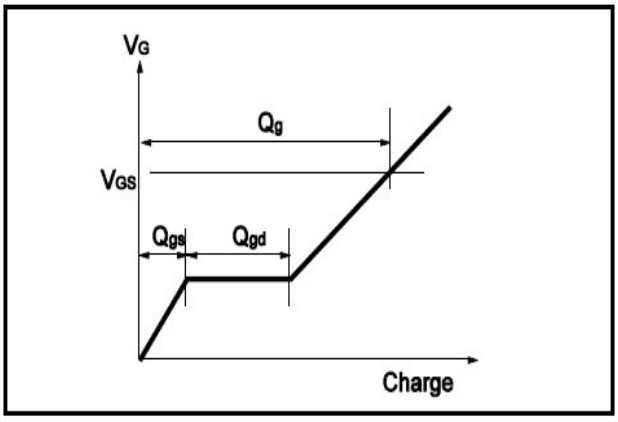


Fig.15 Switching Time Measurement Circuit

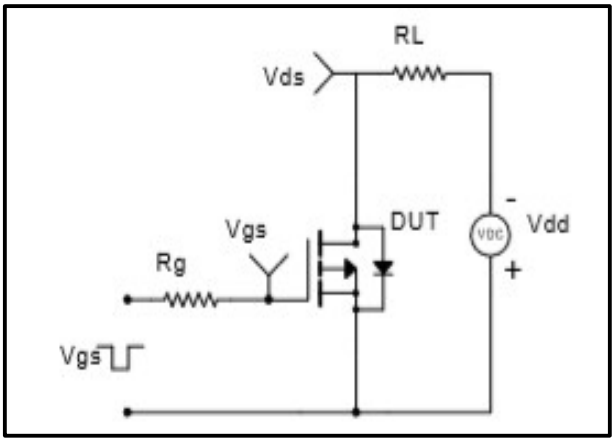


Fig.16 Gate Charge Waveform

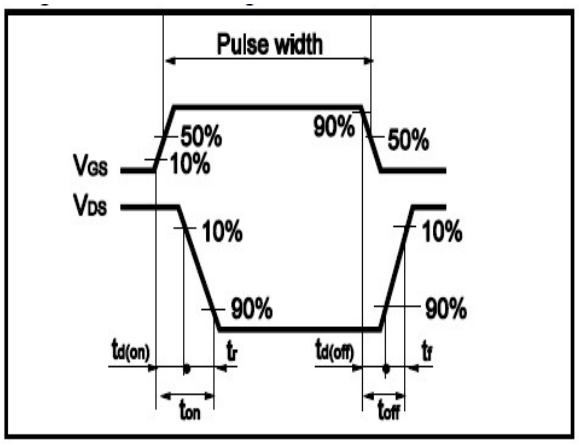


Fig.17 Avalanche Measurement Circuit

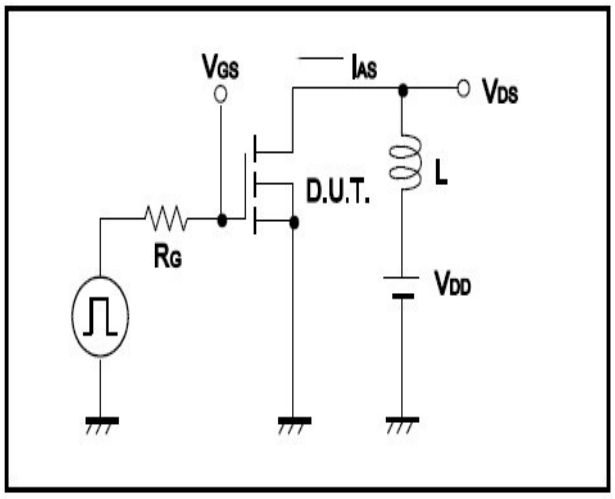
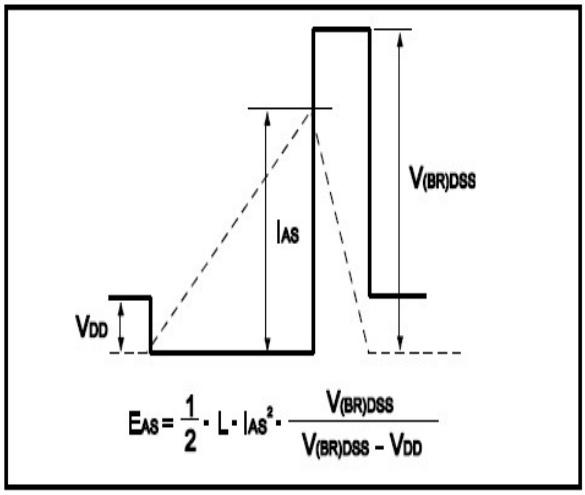


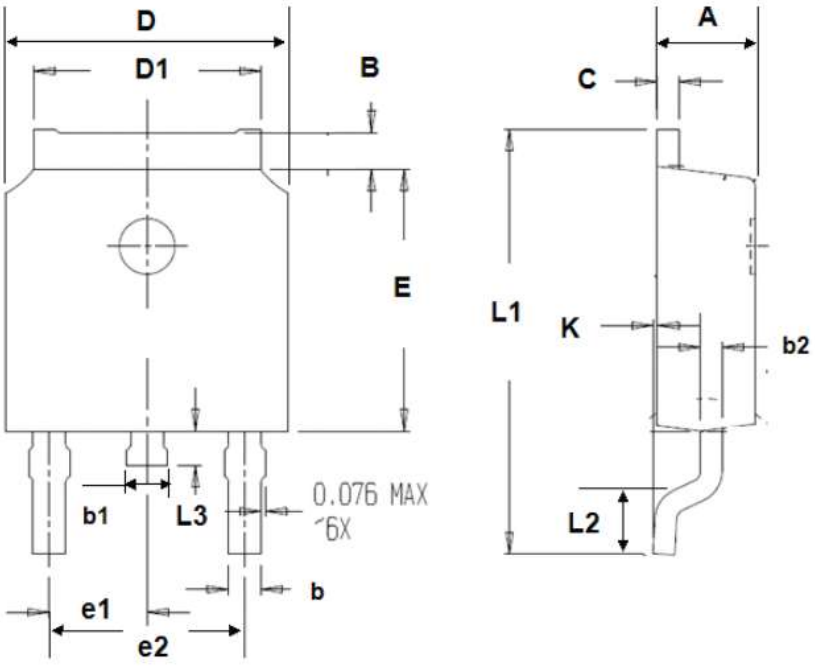
Fig.18 Avalanche Waveform



•Dimensions (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			



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