



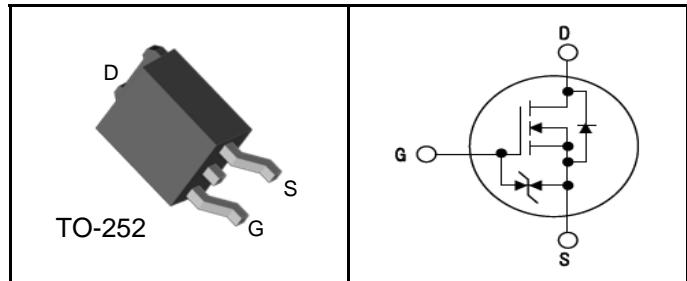
志高电源

MPSD80M380B

800V N-Channel Super Junction MOSFET

Features

- $BV_{DSS}=800\text{ V}$, $I_D=13.0\text{ A}$
- $R_{DS(on)}:0.38\Omega\text{ (Max) } @ V_{GS}=10\text{V}$
- Very Low FOM ($R_{DS(on)} \times Q_g$)
- Extremely low switching loss
- Excellent stability and uniformity
- 100% Avalanche Tested
- Built-in ESD Diode



Application

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- TV power & LED Lighting Power
- AC to DC Converters
- Telecom

RoHS

Device Marking and Package Information

Ordering code	Package	Marking
MPSD80M380B	TO-252	MP80M380B

Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	800	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_C = 25^\circ\text{C}$)	13.0	A
	Drain Current - Continuous ($T_C = 100^\circ\text{C}$)	8.2	A
$I_{DM}^1)$	Drain Current - Pulsed	39	A
$E_{AS}^2)$	Single Pulsed Avalanche Energy	320	mJ
I_{AR}	Avalanche Current	8.0	A
dv/dt	MOSFET dv/dt ruggedness, $V_{DS}=0\ldots 400\text{V}$	50	V/ns
dv/dt	Reverse diode dv/dt , $V_{DS}=0\ldots 400\text{V}$, $I_{DS} \leq I_D$	15	V/ns
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	114	W
$V_{ESD(G-S)}$	Gate source ESD(HBM-C=100pF, $R=1.5\text{K}\Omega$)	2000	V
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	°C

Thermal Resistance Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Max.	1.1	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient , Max.	62.5	°C/W



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MPSD80M380B

Electrical Characteristics $T_J=25\text{ }^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
On Characteristics						
V_{GS}	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = 480\text{ }\mu\text{A}$	2.0	-	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}$, $I_D = 3.4\text{ A}$	-	0.33	0.38	Ω
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_D = 1\text{ mA}$	800	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 800\text{ V}$, $V_{GS} = 0$	-	-	1	μA
		$V_{DS} = 800\text{ V}$, $T_C = 150^\circ\text{C}$	-	-	100	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = \pm 20\text{ V}$, $V_{DS} = 0\text{ V}$	-	-	± 1	μA
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = 500\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1.0\text{ MHz}$	-	1250	-	pF
C_{oss}	Output Capacitance		-	26	-	pF
C_{rss}	Reverse Transfer Capacitance		-	3.4	-	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Time	$V_{DS} = 400\text{ V}$, $I_D = 6.2\text{ A}$, $R_G = 25\text{ }\Omega$ (Note 3,4)	-	29	-	ns
t_r	Turn-On Rise Time		-	21	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	136	-	ns
t_f	Turn-Off Fall Time		-	17	-	ns
Q_g	Total Gate Charge	$V_{DS} = 640\text{ V}$, $I_D = 6.2\text{ A}$, $V_{GS} = 10\text{ V}$ (Note 3,4)	-	29	-	nC
Q_{gs}	Gate-Source Charge		-	5.3	-	nC
Q_{gd}	Gate-Drain Charge		-	8.9	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current	-	-	13	A	
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current	-	-	39	A	
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}$, $I_S = 6.2\text{ A}$	-	-	1.3	V
trr	Reverse Recovery Time	$V_R = 400\text{ V}$, $I_F = 6.2\text{ A}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$	-	368	-	ns
Qrr	Reverse Recovery Charge		-	4.0	-	μC

Notes :

- Repetitive Rating : Pulse width limited by maximum junction temperature
- $I_{AS}=8.0\text{ A}$ $V_{DD}=50\text{ V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$
- Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
- Essentially Independent of Operating Temperature

Typical Characteristics

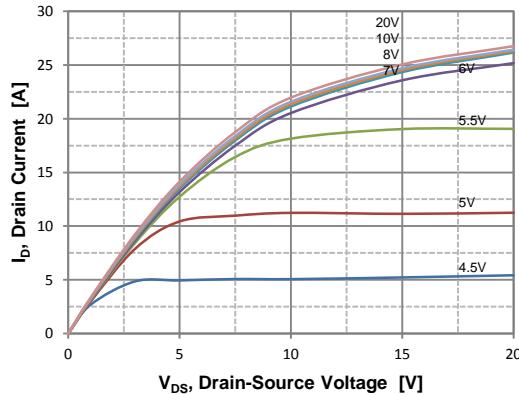


Figure 1. On Region Characteristics

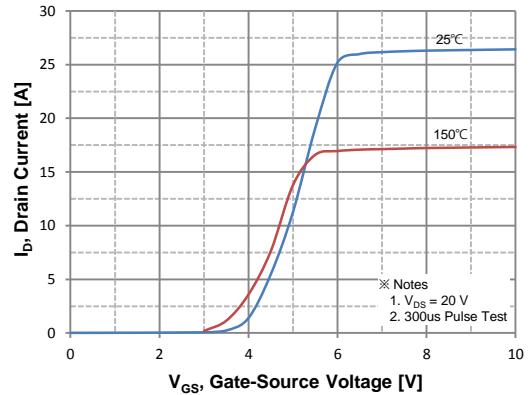


Figure 2. Transfer Characteristics

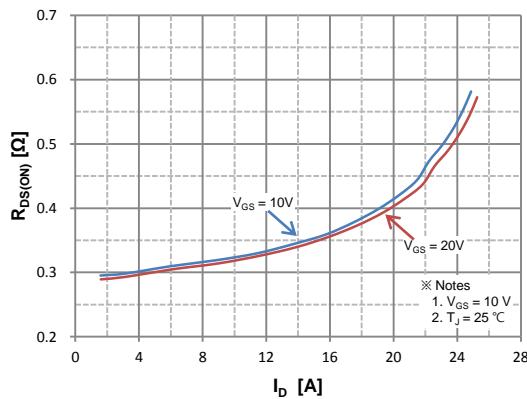


Figure 3. On Resistance Variation vs Drain Current and Gate Voltage

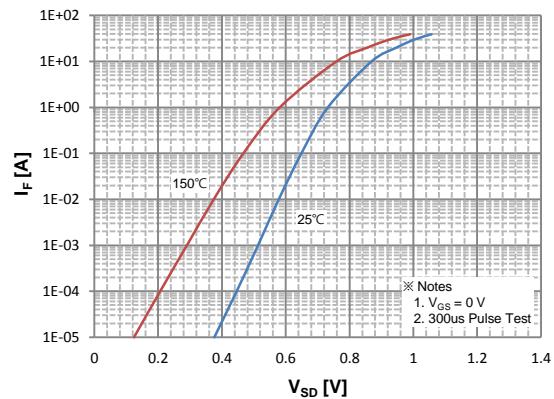


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

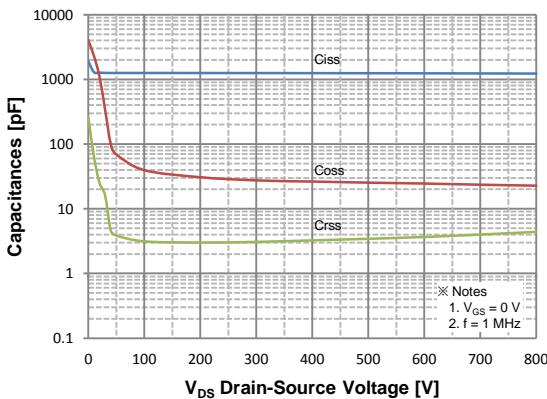


Figure 5. Capacitance Characteristics

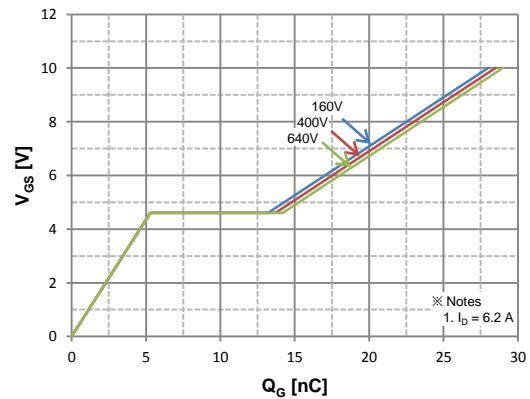
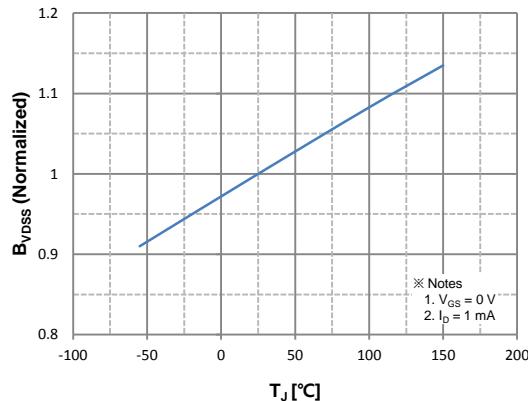
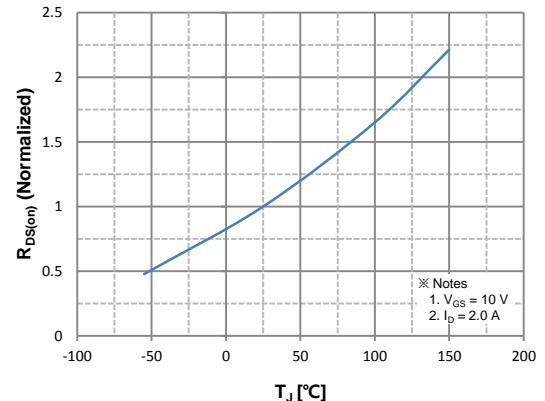


Figure 6. Gate Charge Characteristics

Typical Characteristics



**Figure 7. Breakdown Voltage Variation
vs. Temperature**



**Figure 8. On-Resistance Variation
vs. Temperature**

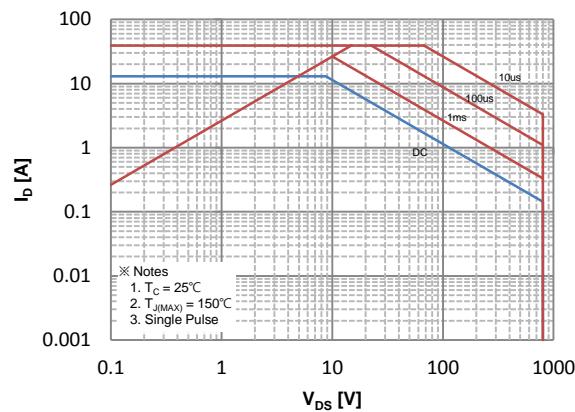
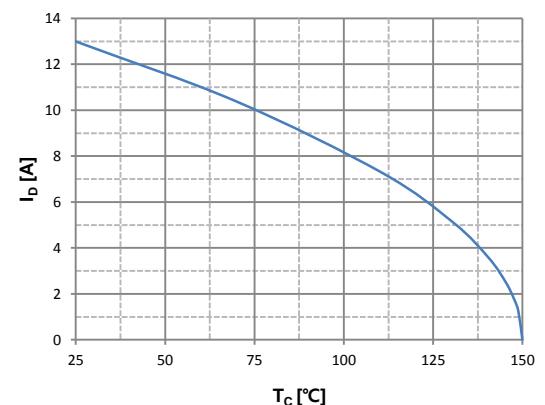


Figure 9. Maximum Safe Operating Area



**Figure 10. Maximum Drain Current
vs. Case Temperature**

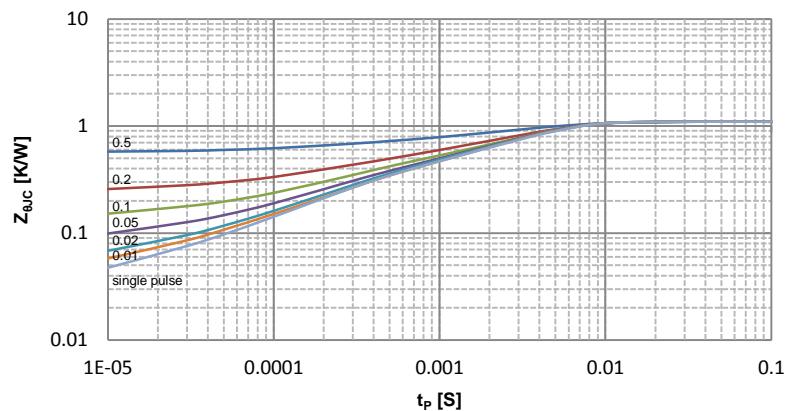


Figure 11. Transient Thermal Response Curve

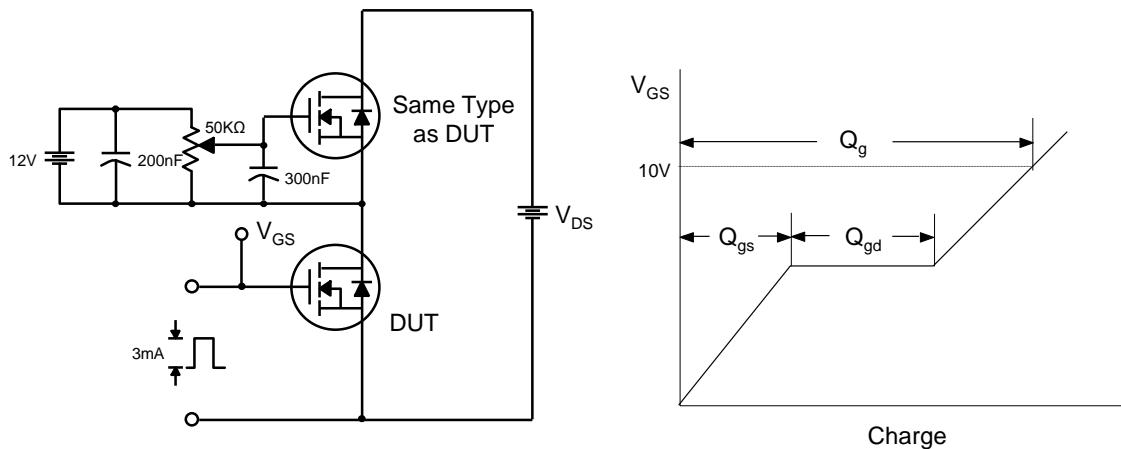
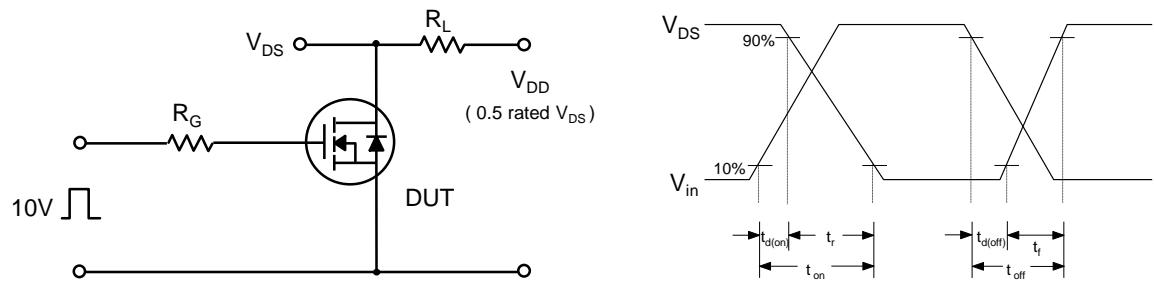
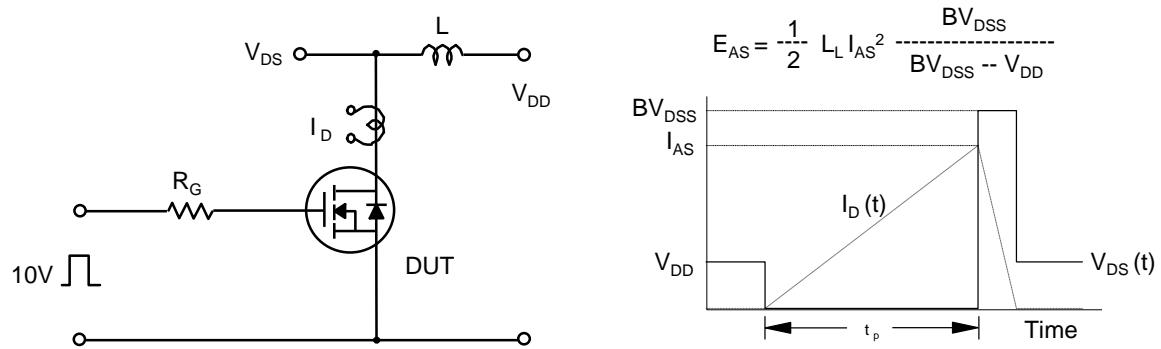
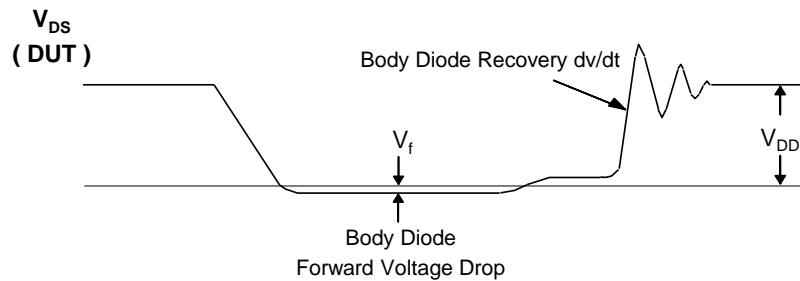
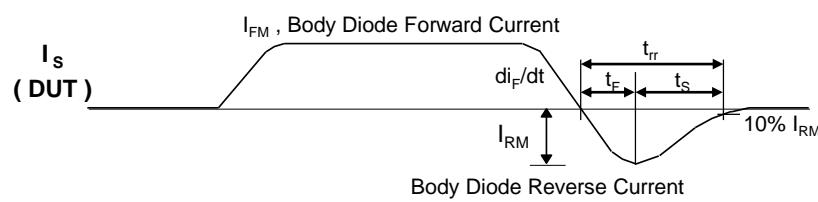
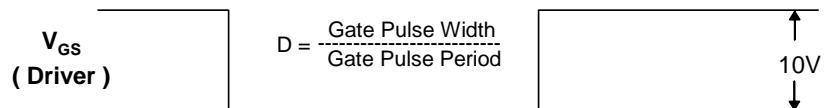
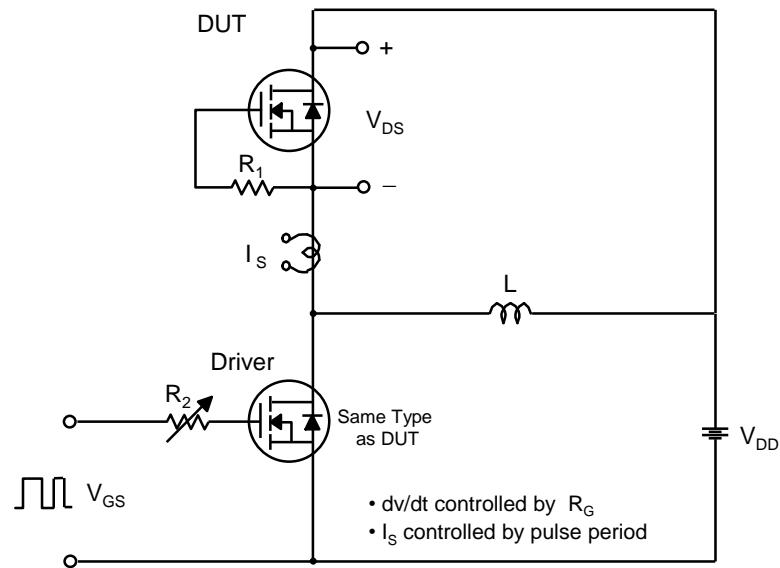
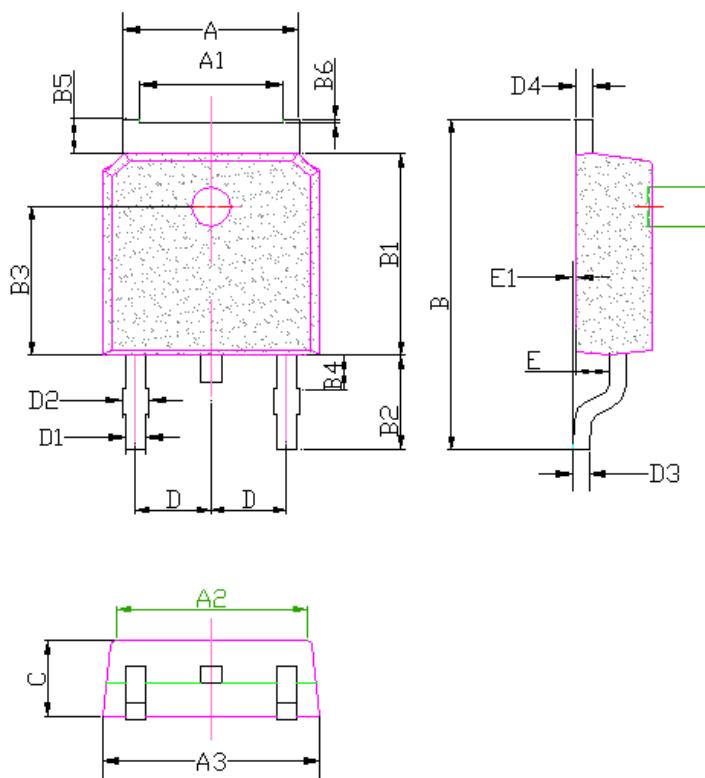
Fig 12. Gate Charge Test Circuit & Waveform

Fig 13. Resistive Switching Test Circuit & Waveforms

Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms


Fig 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms


TO-252


DIM	MILLIMETERS
A	5.33±0.2
A1	4.33±0.2
A2	5.80±0.1
A3	6.6±0.2
B	10±0.5
B1	6.1±0.3
B2	2.85±0.5
B3	4.5±0.15
B4	1.0±0.1
B5	1.05±0.1
B6	0.1±0.05
C	2.3±0.15
D	2.286±0.05
D1	0.60±0.1
D2	0.72±0.12
D3	0.5±0.08
D4	0.5±0.08
E	1.01±0.15
E1	0.1±0.05
DIA	Ø1.2(deep 0.1)

Unit :mm