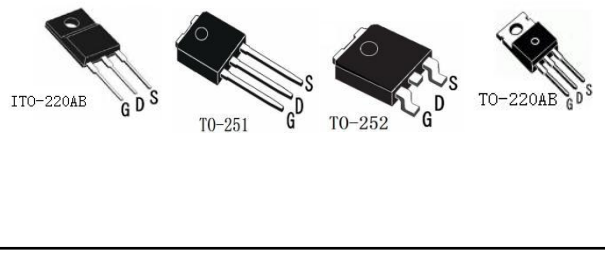
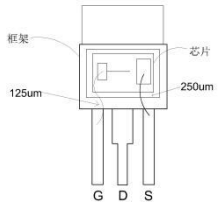
YJ4N80





Feature:

- Low Crss
- Low Gate Charge
- Fast Switching
- Improved ESD Capability
- Improved dv/dt Capability
- 100% Avalanche Energy Test

Mechanical Data:

- **Package： MOS**
  Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant
- **Terminal：Tin plated leads**,
  Solderable per J-STD-002 and JESD22-B102
- **Polarity：** As marked on body

■ Ordering Information

P/N	PACKAGE	PACKING CODE	UNIT WEIGHT(g)	MINIIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJ4N80CI	ITO-220AB	B1	Approximate 1.7	50	1000	5000	TUBE
YJ4N80CZ	TO-220AB	B1	Approximate 2.0	50	1000	5000	TUBE
YJ4N80CM	TO-263	B1	Approximate 1.4	50	1000	5000	TUBE
YJ4N80CH	TO-251	B1	Approximate 0.4	75	4500	22500	TUBE
YJ4N80CP	TO-252	F1	Approximate 0.4	2500	5000	25000	

■ Maximum Ratings (T_a=25℃ Unless otherwise specified)

Parameter	Symbol		Value	Unit
Drain-Source Voltage	V_{DSS}		800	V
Continues Drain Current	I_D	Tc=25℃	3.7*	A
		Tc=100℃	2.2*	
Plused Drain Current (note 1)	I_{DM}		15	A
Gate-to-Source Voltage	V_{GS}		±30	V
Single Pulsed Avalanche Energy (note 2)	E_{AS}		218	mJ

Avalanche Current (note 1)	I_{AR}		3.0	A
Repetitive Avalanche Energy (note 1)	E_{AR}		8	mJ
Peak Diode Recovery (note 3)	dv/dt		4.5	V/ns
Power Dissipation	P_D Tc=25℃	TO-220AB	69	W
		ITO-220AB	26	
		TO-251/TO-252	51	
Power Dissipation Derating Factor	$P_{D(DF)}$ Above 25℃	TO-220AB	0.55	W/℃
		ITO-220AB	0.21	
		TO-251/TO-252	0.39	
Operating and Storage Temperature Range	T_J, T_{STG}		150, -55 ~ +150	℃
Maximum Temperature for Soldering	T_L		300	℃

■Electrical Characteristics（T_a=25℃° Unless otherwise specified）

Off-Characteristics

Parameter	Symbol	Tests Conditions	Min	Type	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	800	-	-	V
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	I_D=250μA, referenced to 25℃	-	0.7	-	V/℃
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=800V,V_{GS}=0V, T_C=25℃	-	-	1	μA
		V_{DS}=640V, T_C=125℃	-	-	10	
Gate-body leakage current, forward	I_{GSSF}	V_{DS}=0V, V_{GS} =30V	-	-	100	nA
Gate-body leakage current, reverse	I_{GSSR}	V_{DS}=0V, V_{GS} = -30V	-	-	-100	nA

On-Characteristics

Parameter	Symbol	Tests Conditions	Min	Type	Max	Unit
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D=250μA	2.0	-	4.0	V

Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=2.0A	-	3	3.8	Ω
Forward Transconductance	g_{fs}	V_{DS} = 40V, I_D=2.0A (note4)	-	4.0	-	S

Dynamic Characteristics

Parameter	Symbol	Tests Conditions	Min	Type	Max	Unit
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS} =0V, f=1.0MHZ	-	517	637	pF
Output capacitance	C_{oss}		-	48	78	pF
Reverse transfer capacitance	C_{rss}		-	7	20	pF

Switching Characteristics

Parameter	Symbol	Tests Conditions	Min	Type	Max	Unit
Turn-On delay time	$t_{d(on)}$	V_{DD}=400V, I_D=3.7A, R_G=25Ω (note 4, 5)	-	15	40	ns
Turn-On rise time	t_r		-	43.5	95	ns
Turn-Off delay time	$t_{d(off)}$		-	22.5	55	ns
Turn-Off Fall time	t_f		-	32	75	ns
Total Gate Charge	Qg	V_{DS} =640V , I_D=3.7A, V_{GS} =10V (note 4, 5)	-	13	17	nC
Gate-Source charge	Qgs		-	3.4	-	nC
Gate-Drain charge	Qgd		-	8	-	nC

Drain-Source Diode Characteristics and Maximum Ratings

Parameter	Symbol	Tests Conditions	Min	Type	Max	Unit
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	3.7	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	15	A

Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=3.7A	-	-	1.4	V
Reverse recovery time	t_{rr}	V_{GS}=0V, I_S=3.7A dI_F/dt=100A/μs (note 4)	-	642	-	ns
Reverse recovery charge	Q_{rr}		-	4.0	-	μC

■ Thermal Characteristics （Ta=25℃ Unless otherwise specified）

Parameter	Symbol		Max	Unit
Thermal Resistance, Junction to Case	Rth(j-c)	TO-220AB	1.81	℃/W
		ITO-220AB	4.75	
		TO-251/TO-252	2.5	
Thermal Resistance, Junction to Ambient	Rth(j-A)	TO-220AB	62.5	℃/W
		ITO-220AB	62.5	
		TO-251/TO-252	83	

* Drain current limited by maximum junction temperature

Notes:

1：Pulse width limited by maximum junction temperature

2：L=25mH, I_{AS}=4A, V_{DD}=50V, R_G=25Ω, Starting T_J=25℃

3：I_{SD} ≤4A, di/dt ≤300A/μs, V_{DD}≤BV_{DSS}, Starting T_J=25℃

4：Pulse Test: Pulse Width ≤300μs, Duty Cycle≤2%

5：Essentially independent of operating temperature

■ Characteristics (Typical)

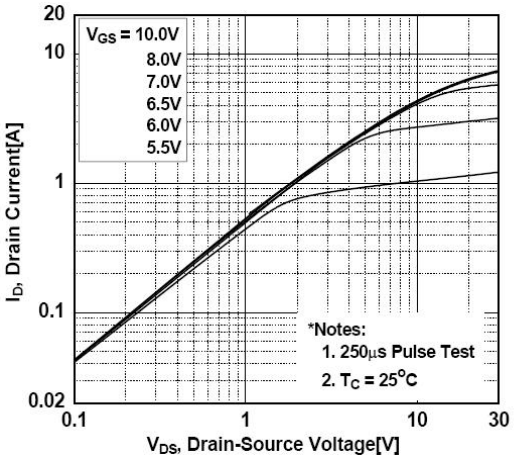


Fig. 1 On-State Characteristics

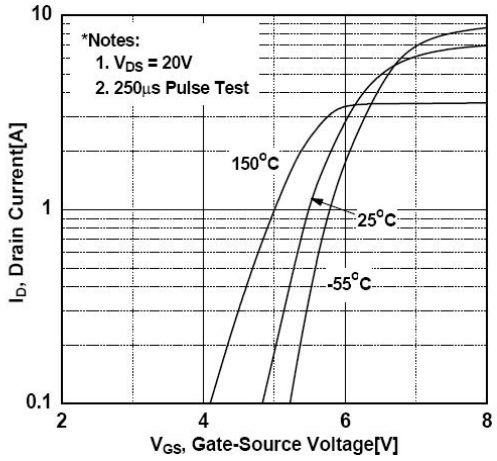


Fig. 2 Transfer Characteristics

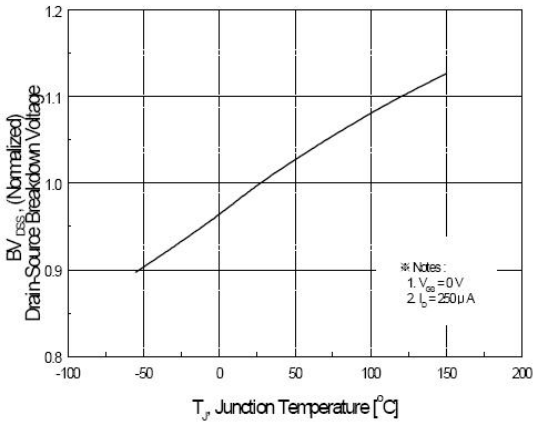


Fig. 3 Breakdown Voltage Variation vs Temperature

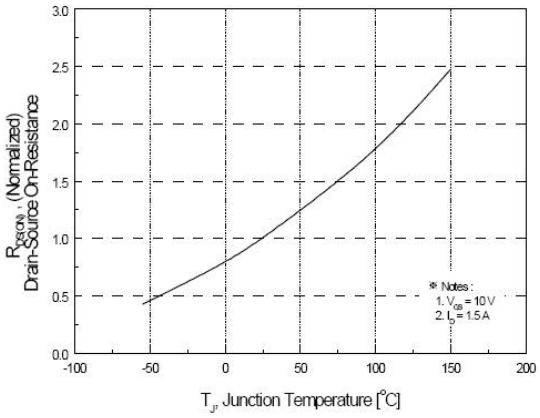


Fig. 4 On-Resistance Variation vs Temperature

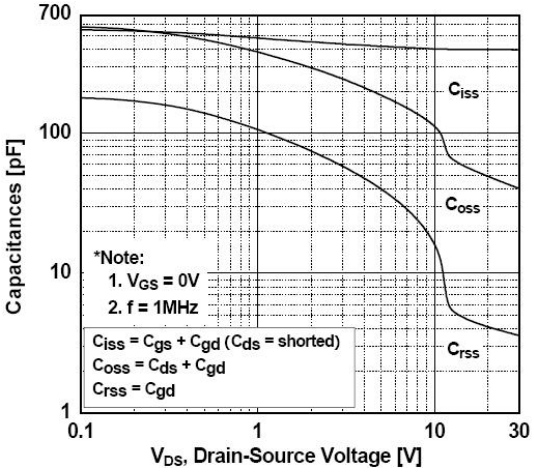


Fig. 5 Capacitance Characteristics

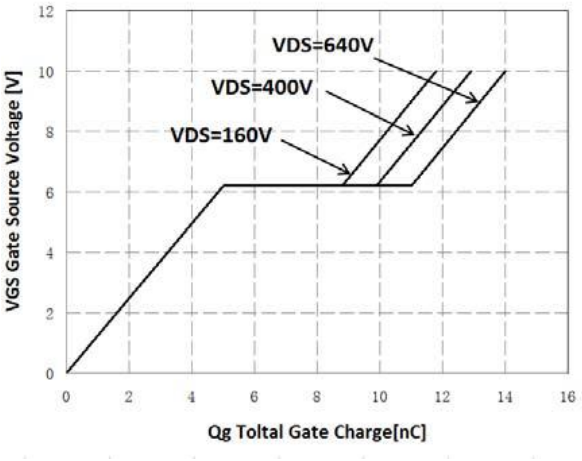


Fig. 6 Gate Charge Characteristics

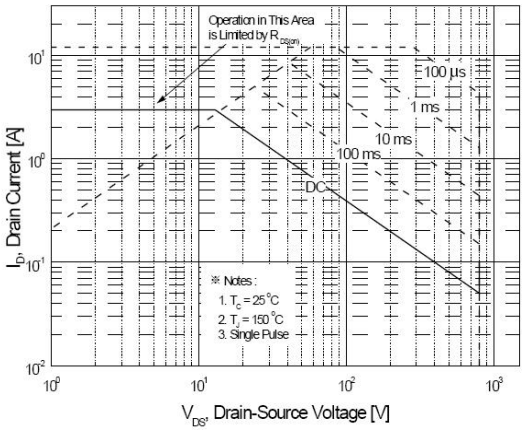


Fig. 7 Maximum Safe Operating Area

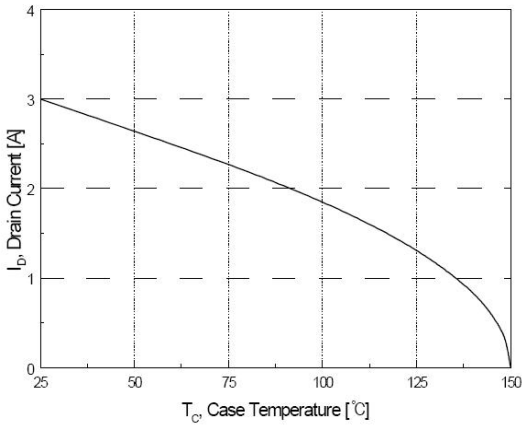


Fig. 8 Maximum Drain Current vs Case Temperature

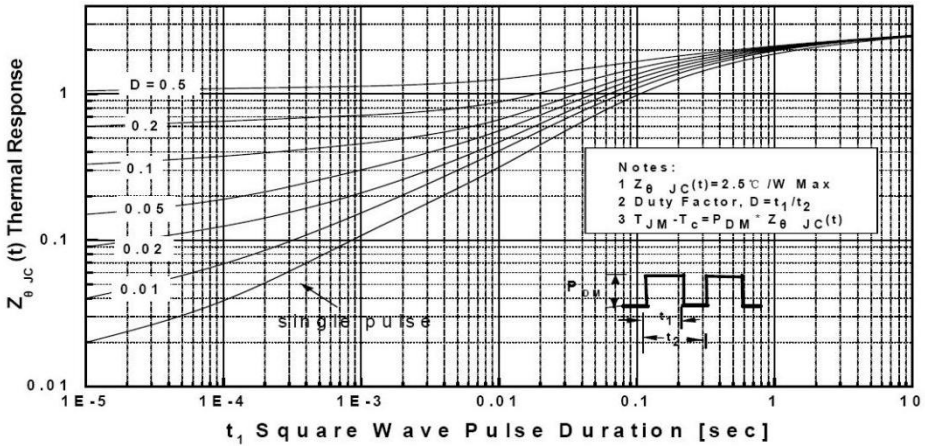


Fig. 9 Transient Thermal Response Curve(TO-251/TO-252)

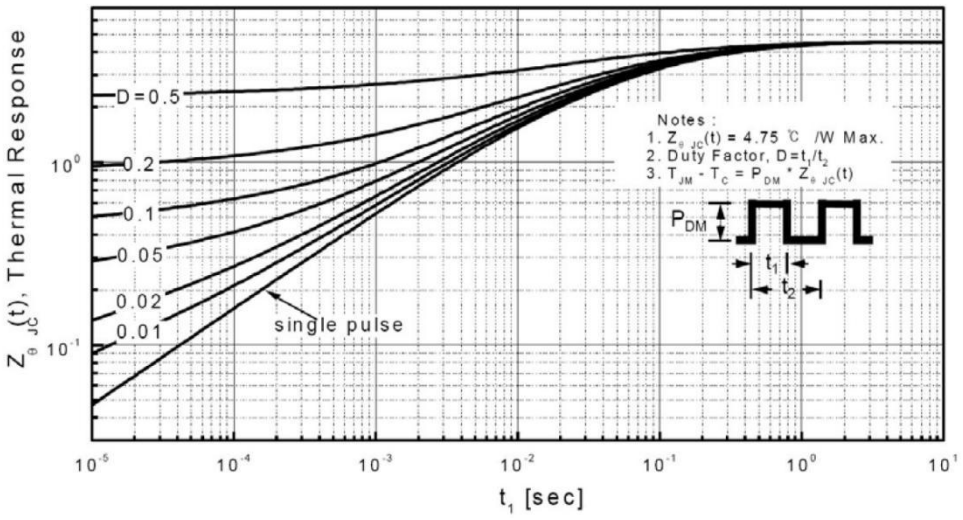


Fig. 10 Transient Thermal Response Curve(ITO-220)

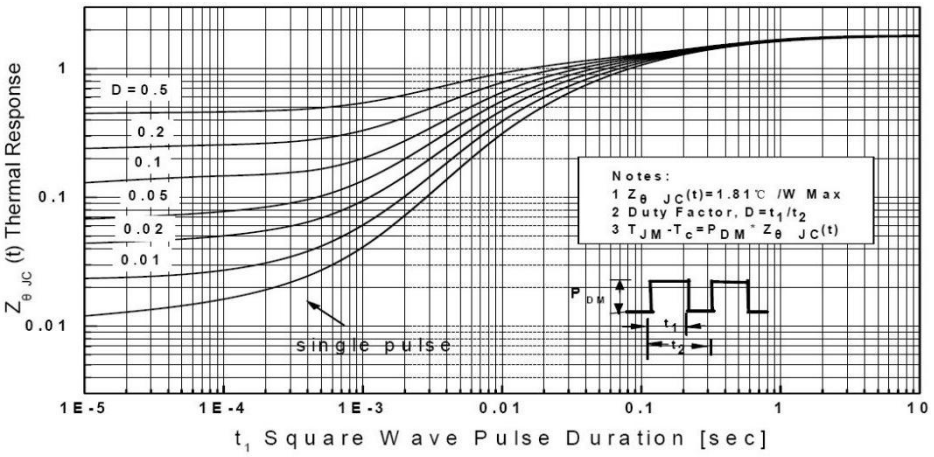
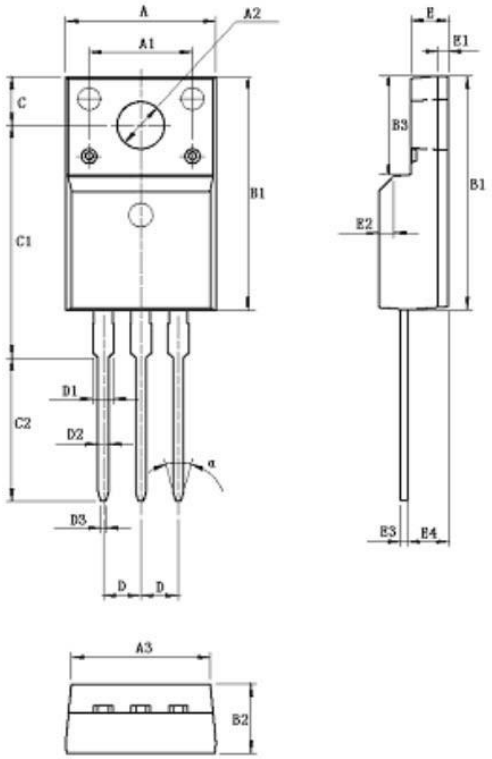


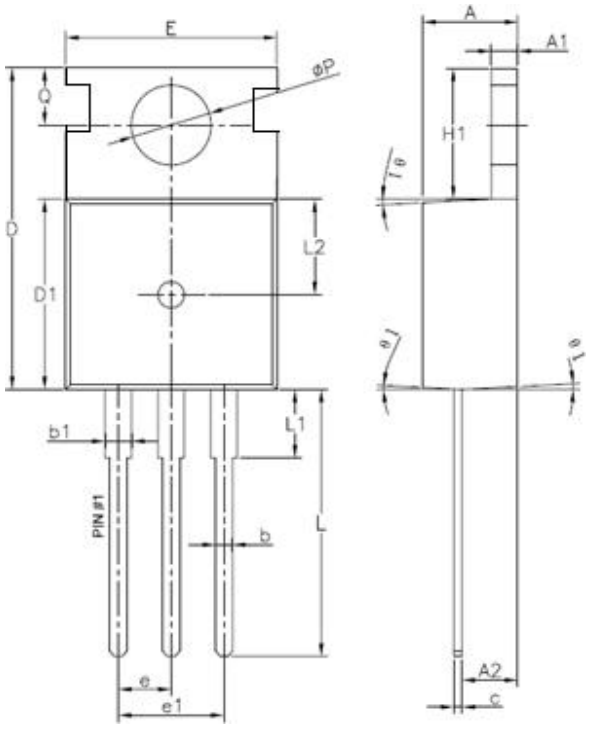
Fig. 11 Transient Thermal Response Curve(TO-220AB)

■ Outline Dimensions

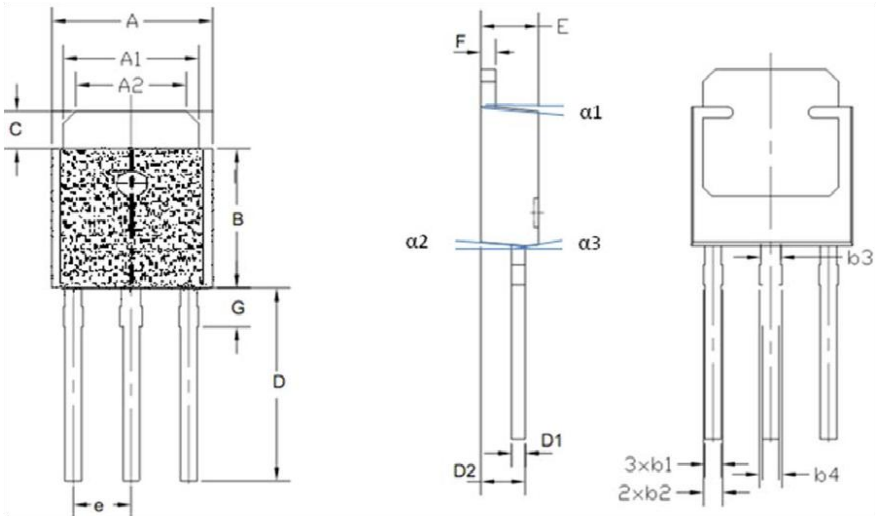


Symbol	Min	Max	Symbol	Min	Max
A	9.96	10.36	**D**	2.54	
A1	7.00		**D1**	1.15	1.35
A2	3.08	3.28	**D2**	0.70	0.90
A3	9.25	9.65	**D3**	0.28	0.48
B1	15.70	16.10	**E**	2.34	2.74
B2	4.50	4.90	**E1**	0.70	
B3	6.20	6.80	**E2**	1.0×45°	
C	3.20	3.40	**E3**	0.36	0.65
C1	15.20	16.00	E4	2.55	2.95

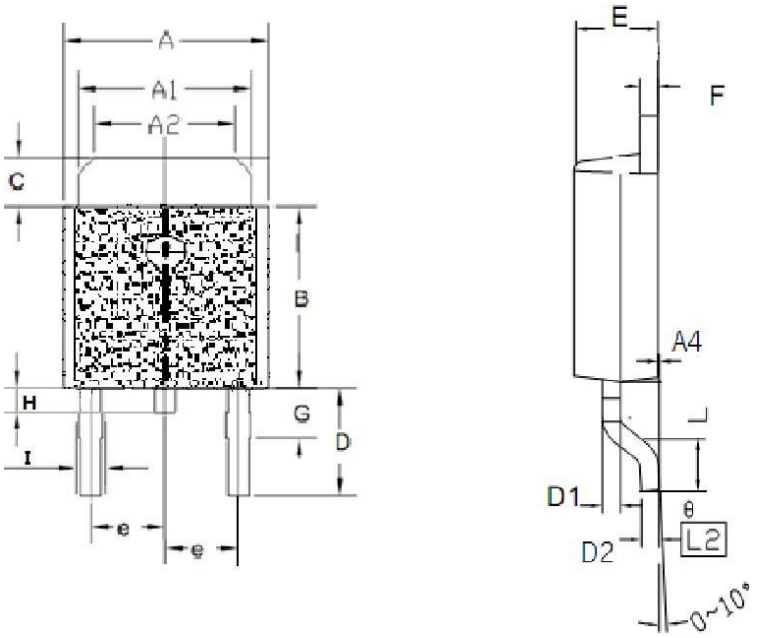
C2	9.75	10.15	a(度）	30°



Symbol	Min	Normal	Max	Symbol	Min	Normal	Max
A	4.4	4.5	4.6	e		2.54	
A1	1.27	1.3	1.33	e1		5.08	
A2	2.3	2.4	2.5	H1	6.3	6.5	6.7
b	0.7	/	0.9	L	13.0	13.38	13.5
b1	1.25		1.42	L1	/	/	3.5
c	0.45	0.5	0.6	L2		4.6	
D	15.3	15.7	16.1	ΦP	3.55	3.6	3.65
D1	9.1	9.2	9.3	Q	2.73	/	2.87
E	9.7	9.9	10.2	θ1（°）	1	3	5



Symbol	Min	Max	Symbol	Min	Max
A	6.40	6.60	**D1**	0.45	0.55
A1	5.20	5.40	**D2**	1.51	1.61
A2	4.40	4.60	**e**	2.30	
B	6.00	6.20	**E**	2.20	2.40
b1	0.55	0.65	**F**	0.49	0.59
b2	0.60	0.90	**G**	1.70	
b3	0.80		**α1(度)**	8.00	
b4	0.95	1.05	**α2(度)**	8.00	
C	0.90	0.96	**α3(度)**	8.00	
D	9.15	9.55			



Symbol	Min	Max	Symbol	Min	Max
A	6.40	6.60	**D**	2.90	3.10
A1	5.20	5.40	**D1**	0.45	0.55
A2	4.40	4.60	**D2**	0.45	0.55
A3	4.40	4.60	**e**	2.30	
A4	0.00	0.15	**E**	2.20	2.40
A5	4.65	4.95	**F**	0.49	0.59
B	6.00	6.20	**G**	1.70	
B1	1.57	1.77	**L**	1.40	1.60
C	0.90	0.96	**θ(度)**	0.00	10.00
I	0.60	0.90	**H**	0.49	0.52

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