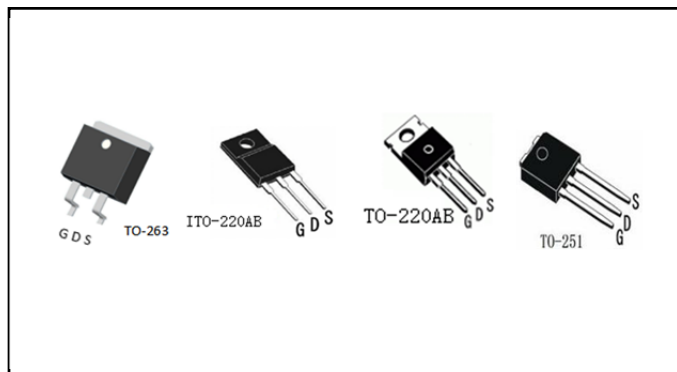


N-Channel Enhancement Mode Mosfet

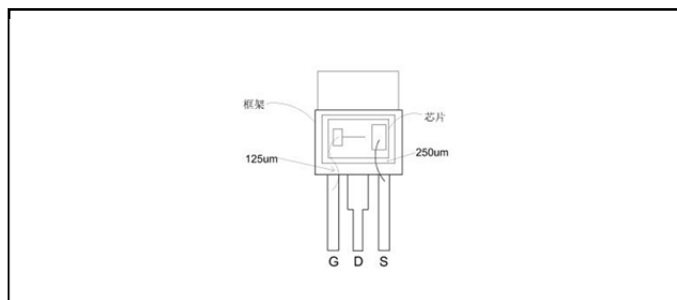


Feature:

- 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
YJ7N70CI	ITO-220AB	B1	Approximate 1.7	50	1000	5000	TUBE
YJ7N70CZ	TO-220AB	B1	Approximate 2.0	50	1000	5000	TUBE
YJ7N70CH	TO-251	B1	Approximate 0.4	75	4500	22500	TUBE
YJ7N70CM	TO-263	B1	Approximate 1.4	50	1000	5000	TUBE

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

Parameter	Symbol		Value	Unit
Drain-Source Voltage	V _{DSS}		700	V
Continues Drain Current	I _D	T _c =25℃	7*	A
		T _c =100℃	3.6*	
Plused Drain Current (note 1)	I _{DM}		24	A
Gate-to-Source Voltage	V _{GS}		±30	V
Single Pulsed Avalanche Energy (note 2)	E _{AS}		210	mJ
Avalanche Current (note 1)	I _{AR}		7.0	A
Repetitive Avalanche Energy (note 1)	E _{AR}		10	mJ
Peak Diode Recovery (note 3)	dv/dt		4.5	V/ns
Power Dissipation	P _D T _c =25℃	TO-220AB/TO-251/ TO-263	100	W
		ITO-220AB	33	
Power Dissipation Derating Factor	P _{D(DF)} Above 25℃	TO-220AB/TO-251/ TO-263	0.8	W/℃
		ITO-220AB	0.26	
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	700	-	-	V
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _J	I _D =250μA, referenced to 25℃	-	0.7	-	V/℃
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =700V, V _{GS} =0V, T _c =25℃	-	-	1	μA
		V _{DS} =560V, 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	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	2.0	-	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 10V$, $I_D = 35A$	-	1.4	1.6	Ω
Forward Transconductance	g_{fs}	$V_{DS} = 40V$, $I_D = 3.5A$ (note4)	-	7.0	-	S

Dynamic Characteristics

Parameter	Symbol	Tests Conditions	Min	Type	Max	Unit
Input capacitance	C_{iss}	$V_{DS} = 25V$, $V_{GS} = 0V$, $f = 1.0MHz$	-	800	1280	pF
Output capacitance	C_{oss}		-	75	145	pF
Reverse transfer capacitance	C_{rss}		-	11	18	pF

Switching Characteristics

Parameter	Symbol	Tests Conditions	Min	Type	Max	Unit
Turn-On delay time	$t_{d(on)}$	$V_{DD} = 350V$, $I_D = 7A$, $R_G = 25\Omega$ (note 4, 5)	-	30	66	ns
Turn-On rise time	t_r		-	72	158	ns
Turn-Off delay time	$t_{d(off)}$		-	123	248	ns
Turn-Off Fall time	t_f		-	81	165	ns
Total Gate Charge	Q_g	$V_{DS} = 560V$, $I_D = 7A$, $V_{GS} = 10V$ (note 4, 5)	-	42	56	nC
Gate-Source charge	Q_{gs}		-	7.0	-	nC
Gate-Drain charge	Q_{gd}		-	11	-	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	-	-	7	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}	-	-	24	A
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0V$, $I_S = 7A$	-	-	1.4	V
Reverse recovery time	t_{rr}	$V_{GS} = 0V$, $I_S = 7A$ $dI_F/dt = 100A/\mu s$ (note 4)	-	340	-	ns
Reverse recovery charge	Q_{rr}		-	2.7	-	μC

■ Thermal Characteristics (T_a=25°C Unless otherwise specified)

Parameter	Symbol		Max	Unit
Thermal Resistance, Junction to Case	R _{th(j-c)}	TO-220AB/TO-251T O-263	1.25	°C/W
		ITO-220AB	3.79	
Thermal Resistance, Junction to Ambient	R _{th(j-a)}	TO-220AB/TO-251/T O-263	62.5	°C/W
		ITO-220AB	62.5	

* Drain current limited by maximum junction temperature

Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: L=11mH, I_{AS}=7A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C
- 3: I_{SD} ≤7A, di/dt ≤300A/μs, V_{DD}≤BV_{DSS}, Starting T_J=25°C
- 4: Pulse Test: Pulse Width ≤300μs, Duty Cycles≤2%
- 5: Essentially independent of operating temperature

■ Characteristics (Typical)

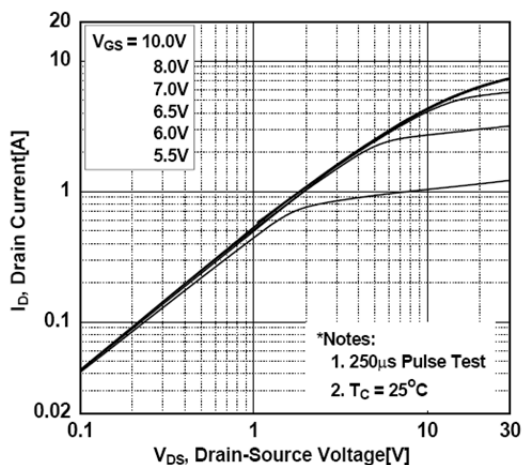


Fig. 1 On-State Characteristics

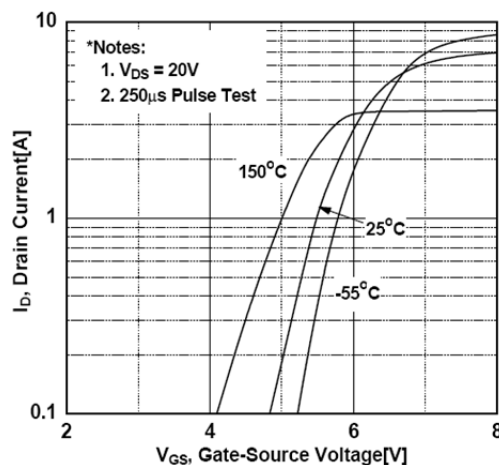


Fig. 2 Transfer Characteristics

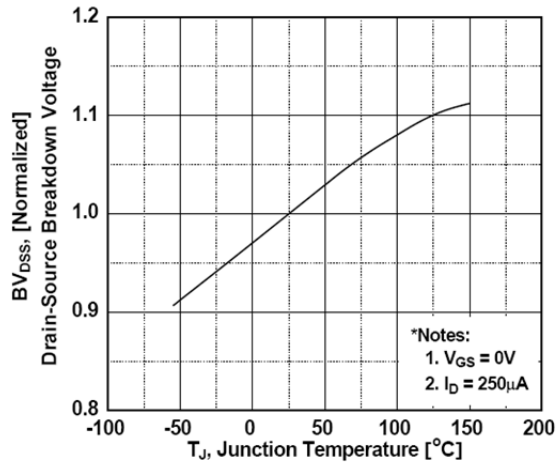


Fig. 3 Breakdown Voltage Variation vs Temperature

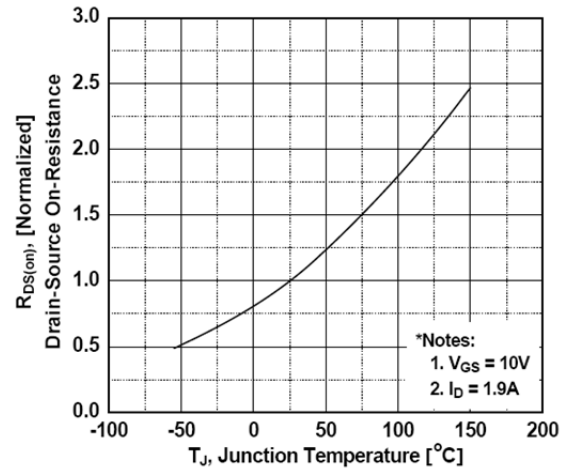


Fig. 4 On-Resistance Variation vs Temperature

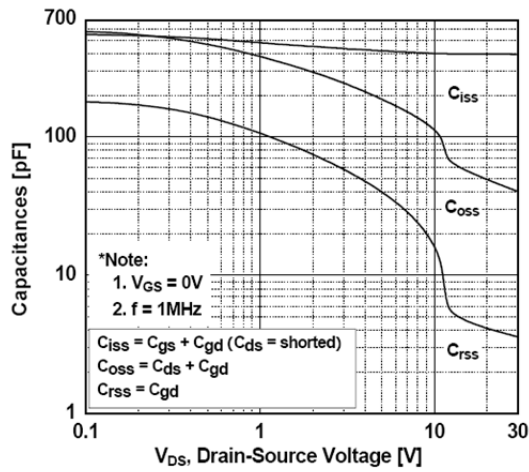


Fig. 5 Capacitance Characteristics

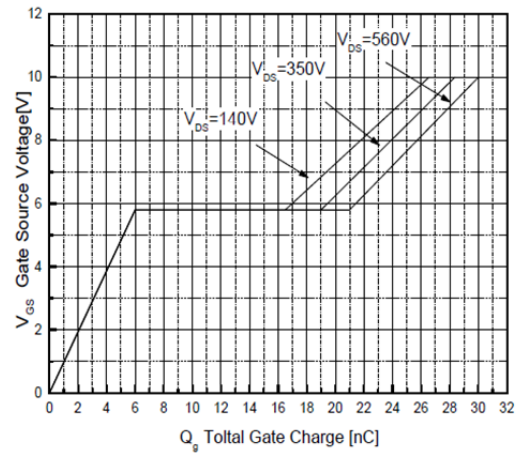


Fig. 6 Gate Charge Characteristics

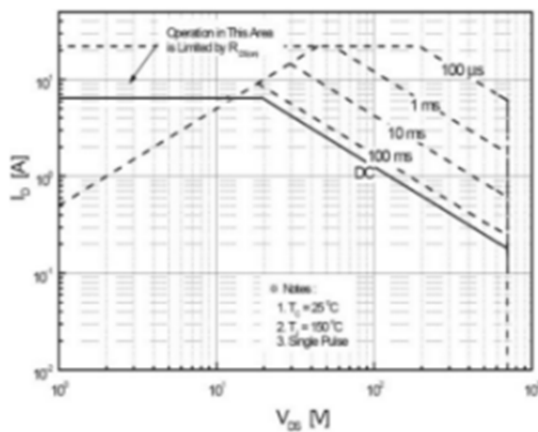


Fig. 7 Maximum Safe Operating Area

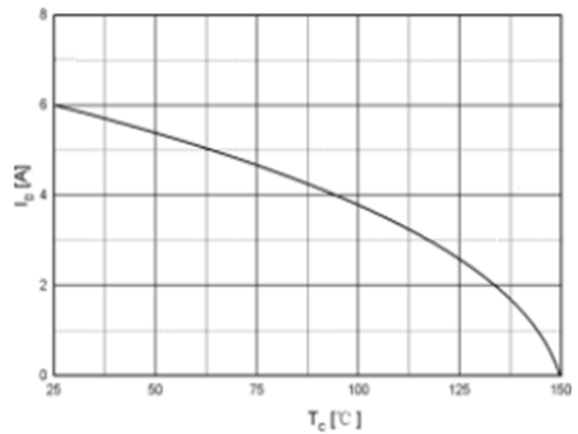


Fig. 8 Maximum Drain Current vs Case Temperature

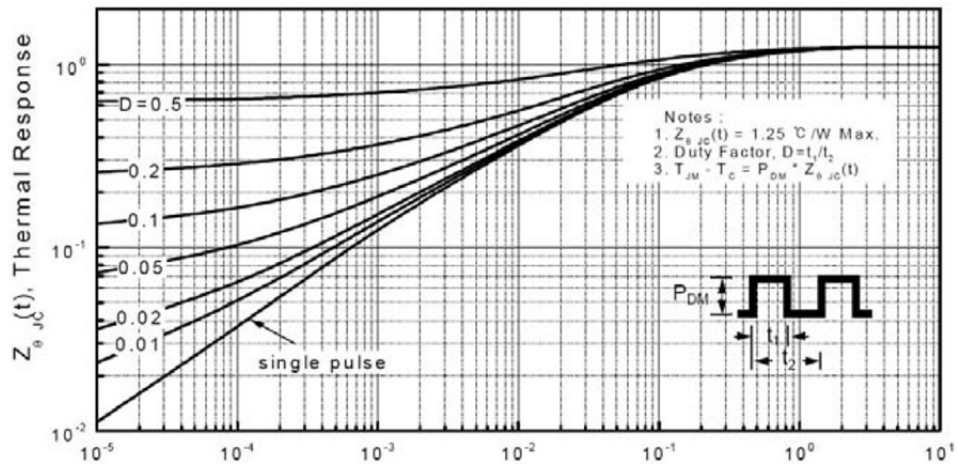


Fig. 9 Transient Thermal Response Curve(TO-220AB/TO-251)

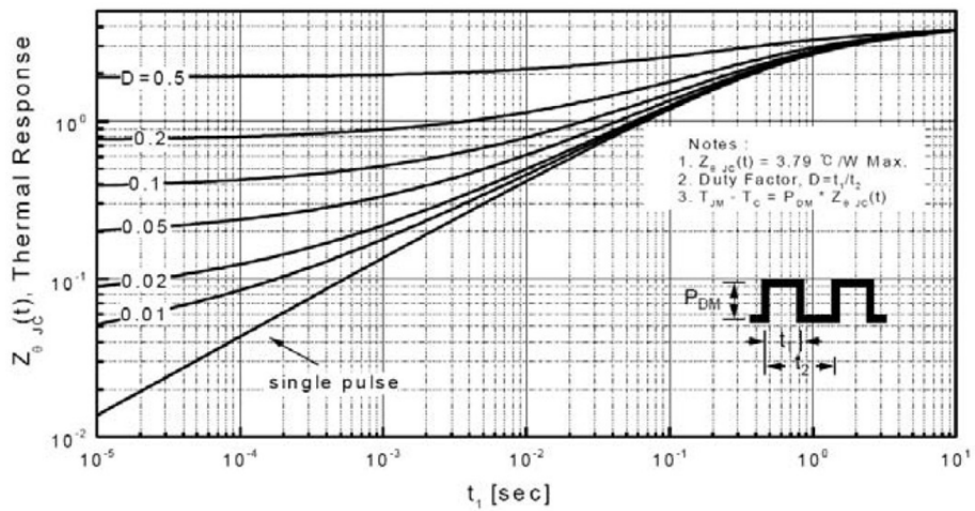
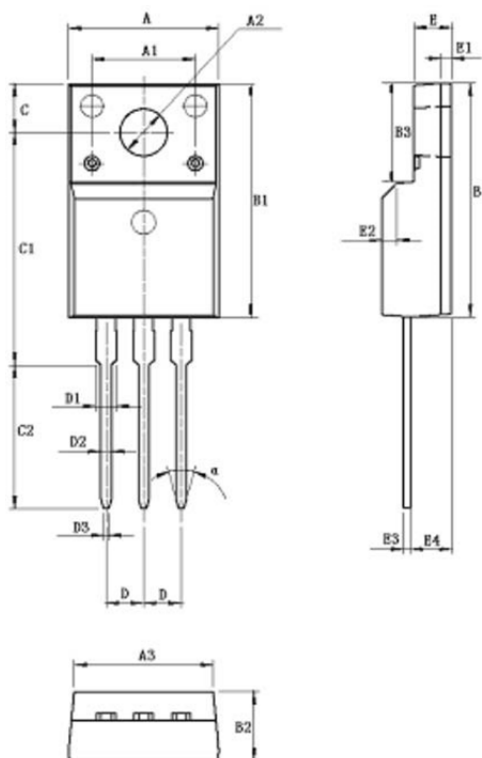


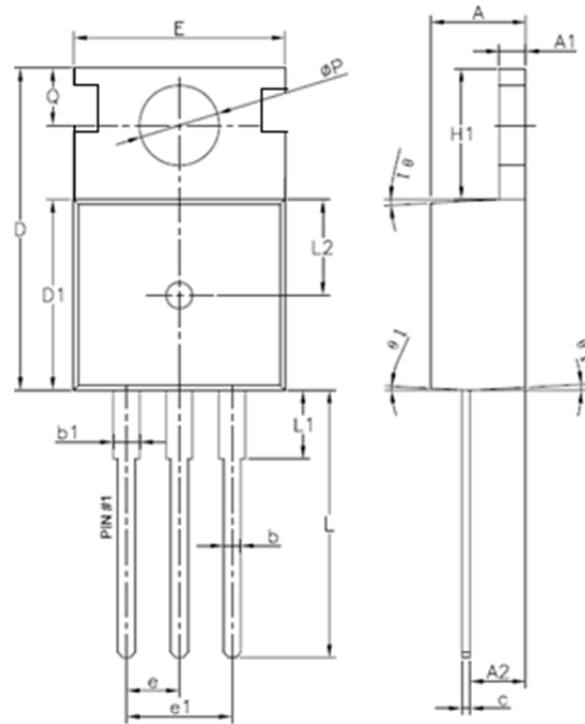
Fig. 10 Transient Thermal Response Curve(ITO-220AB)

■ Outline Dimensions

ITO-220AB

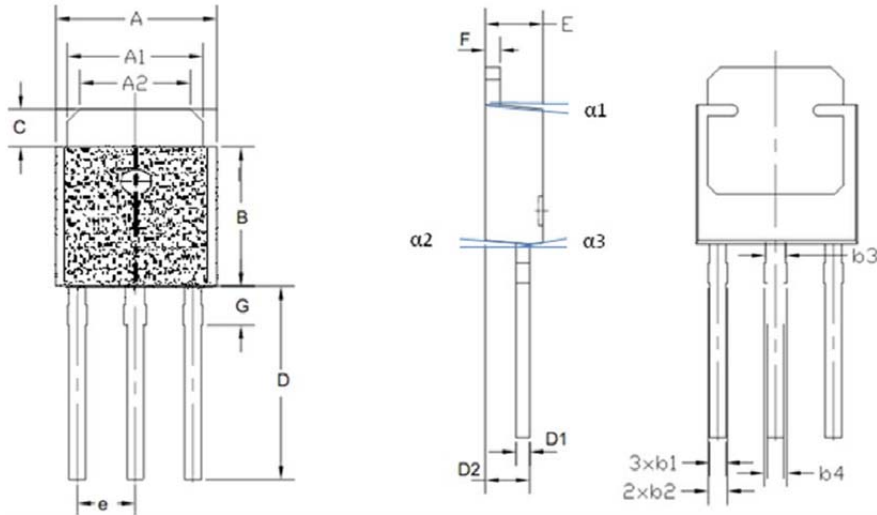


Symbol	Min	Max	Symbol	Min	Max
A	9.96	10.36	D	2.54	
A1	7.00		D1	1.15	1.35
A2	3.08	3.28	D2	0.70	0.90
A3	9.25	9.65	D3	0.28	0.48
B1	15.70	16.10	E	2.34	2.74
B2	4.50	4.90	E1	0.70	
B3	6.20	6.80	E2	1.0×45°	
C	3.20	3.40	E3	0.36	0.65
C1	15.20	16.00	E4	2.55	2.95
C2	9.75	10.15	a(度)	30°	

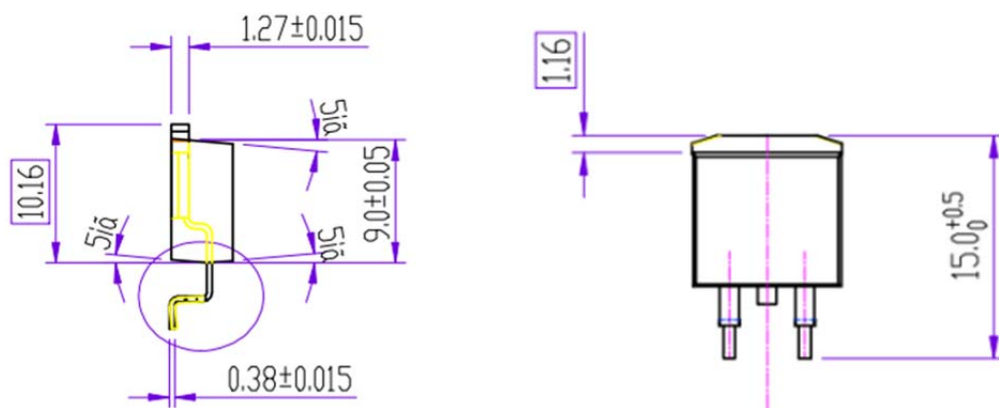


Symbol	Min	Normal	Max	Symbol	Min	Normal	Max
A	4.4	4.5	4.6	e		2.54	
A1	1.27	1.3	1.33	e1		5.08	
A2	2.3	2.4	2.5	H1	6.3	6.5	6.7
b	0.7	/	0.9	L	13.0	13.38	13.5
b1	1.25		1.42	L1	/	/	3.5
c	0.45	0.5	0.6	L2		4.6	
D	15.3	15.7	16.1	ΦP	3.55	3.6	3.65
D1	9.1	9.2	9.3	Q	2.73	/	2.87
E	9.7	9.9	10.2	θ1 (°)	1	3	5

TO-251



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			





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