

PW110N20CBS

Perfect MOS4 N-MOSFET 200V, 9.1mΩ, 110A



重庆平伟实业股份有限公司

Features

- Uses PingWei advanced PerfectMOS4 technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- Excellent Low Ciss
- Qualified according to JEDEC criteria

Benefits

- High robustness and reliability
- Increases maximum current capability
- Low power loss, high power density
- Easy paralleling

Applications

- Synchronous Rectification for AC/DC Quick Charger
- Battery management
- UPS (Uninterruptible Power Supplies)

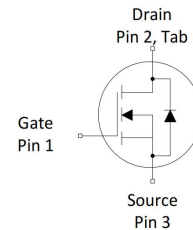
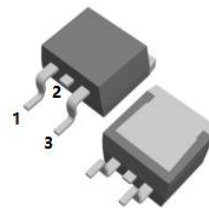


100% DVDS Tested
100% Avalanche Tested

Product Summary

V_{DS}	200V
$R_{DS(on)}$ @10V typ	9.1mΩ
I_D	110A

TO-263CB-2L



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
PW110N20CBS	PW110N20CBS	TO-263CB-2L	Tape&Reel	13 inches	24mm	800pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	200	V
Continuous drain current	I_D	110	A
$T_C = 25^\circ\text{C}$ (Silicon limit)		180	
$T_C = 25^\circ\text{C}$ (Package limit)		70	
$T_C = 100^\circ\text{C}$ (Silicon limit)		8	
$T_a = 25^\circ\text{C}$			
Pulsed drain current ($T_C = 25^\circ\text{C}$, $t_p = 100\mu\text{s}$)	$I_{D\text{ pulse}}$	440	A
Avalanche energy, single pulse ($L=0.5\text{mH}$, $V_{ds}=100\text{V}$)	E_{AS}	342	mJ
Gate-Source voltage	V_{GS}	± 20	V
Power dissipation	P_{tot}	308	W
$T_C = 25^\circ\text{C}$		1.7	
$T_a = 25^\circ\text{C}$			
Operating junction and storage temperature	T_j, T_{stg}	-55...+150	$^\circ\text{C}$
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	T_{sold}	260	$^\circ\text{C}$



Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case.	RthJC	-	0.26	0.41	°C/W	-
Thermal resistance, junction - ambient(min. footprint)	RthJA	-	-	72	°C/W	-

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

Static Characteristic

Drain-source breakdown voltage	BV_{DSS}	200	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	2.0	-	4.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	0.02	1	μA	$V_{DS}=200V, V_{GS}=0V$ $T_j=25^\circ C$ $T_j=150^\circ C$
Gate-source leakage current	I_{GSS}	-	± 10	± 100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	9.1	11.0	mΩ	$V_{GS}=10V, I_D=55A$
Transconductance	g_{fs}	-	74	-	S	$V_{DS}=5V, I_D=55A$

Dynamic Characteristic

Input Capacitance	C_{iss}	-	10380	-	pF	$V_{GS}=0V, V_{DS}=100V,$ $f=1MHz$
Output Capacitance	C_{oss}	-	364	-		
Reverse Transfer Capacitance	C_{rss}	-	64	-		
Gate Total Charge	Q_G	-	143	-	nC	$V_{DS}=100V, I_D=55A,$ $V_{GS}=10V$
Gate-Source charge	Q_{gs}	-	49	-		
Gate-Drain charge	Q_{gd}	-	30	-		
Turn-on delay time	$t_{d(on)}$	-	46	-	ns	$V_{GS}=10V, V_{DD}=100V,$ $R_{G_ext}=4.7\Omega, I_D=55A$
Rise time	t_r	-	21	-		
Turn-off delay time	$t_{d(off)}$	-	88	-		
Fall time	t_f	-	18	-		
Gate resistance	R_G	-	1	-	Ω	$V_{GS}=0V, V_{DS}=0V,$ $f=1MHz$



Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.87	1.2	V	$V_{GS}=0V, I_{SD}=55A$
Body Diode Continuous Forward Current	I_S	-	-	110	A	TC = 25°C
Body Diode Pulsed Current	I_S pulse	-	-	440	A	TC = 25°C
Body Diode Reverse Recovery Time	t_{rr}	-	185	-	ns	$I_F=55A, dI/dt=100A/\mu s$
Body Diode Reverse Recovery Charge	Q_{rr}	-	469	-	nC	



Typical Performance Characteristics

Fig 1: Output Characteristics

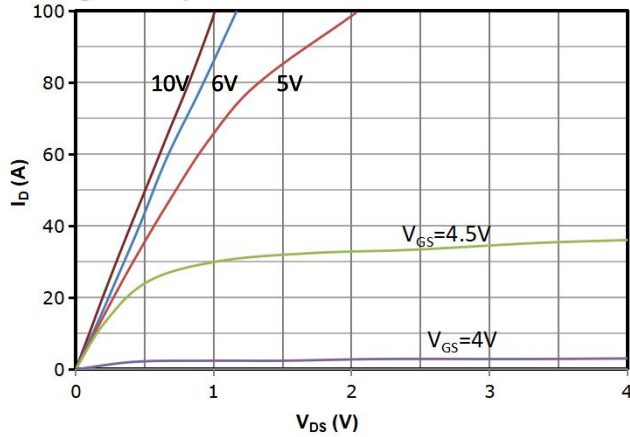


Fig 2: Transfer Characteristics

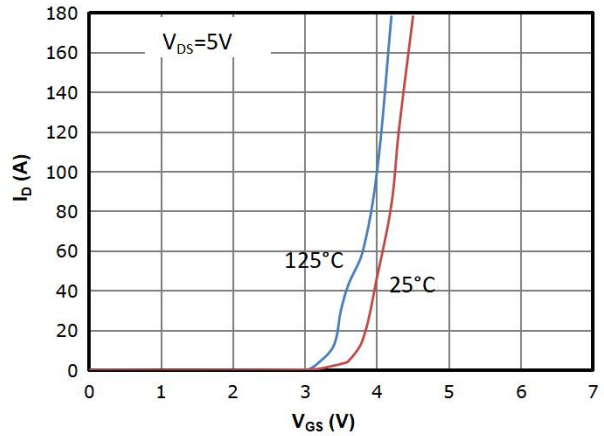


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

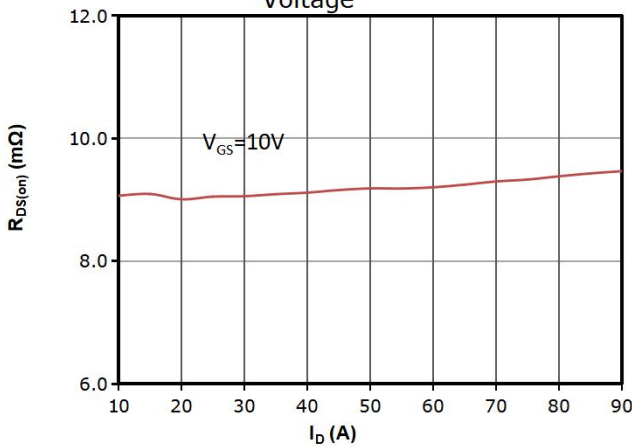


Fig 4: $R_{DS(on)}$ vs Gate Voltage

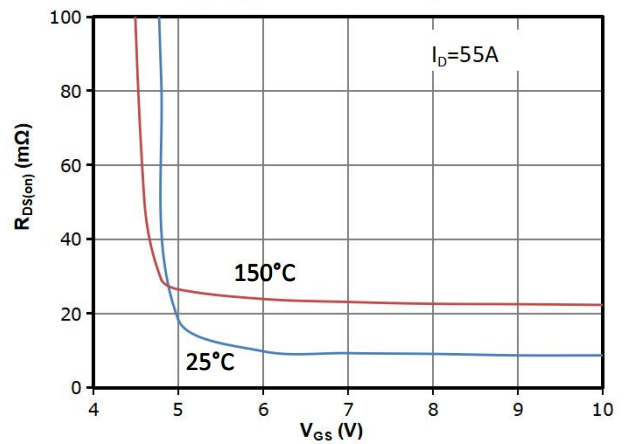


Fig 5: $R_{DS(on)}$ vs. Temperature

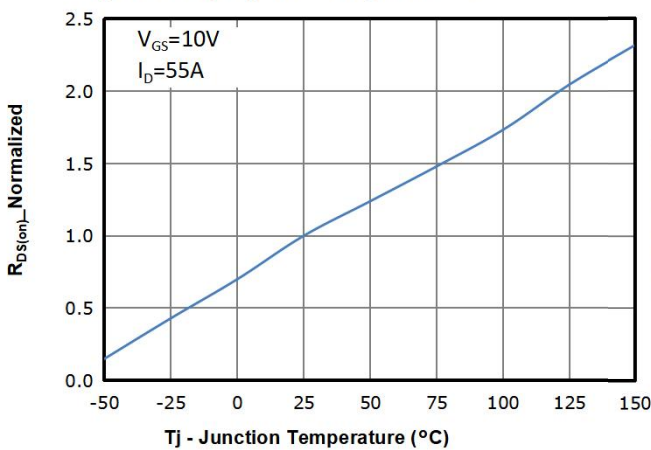


Fig 6: $V_{GS(th)}$ vs. Temperature

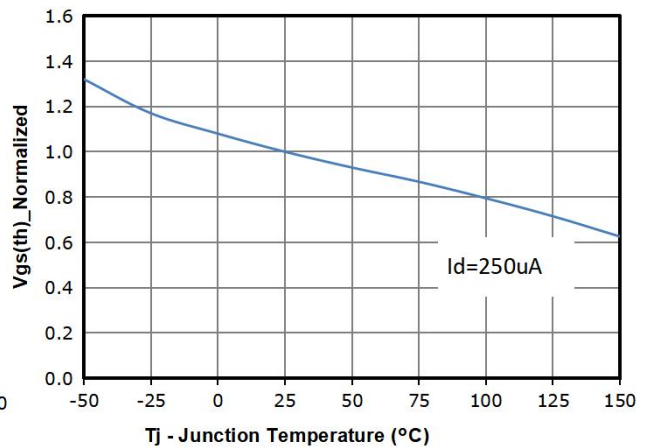




Fig 7: BVdss vs. Temperature

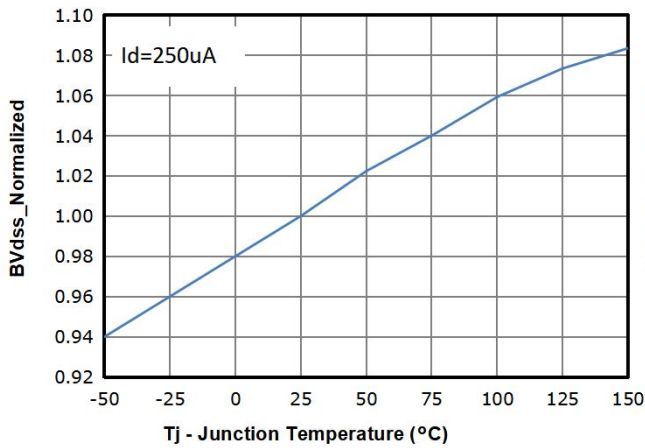


Fig 8: Capacitance Characteristics

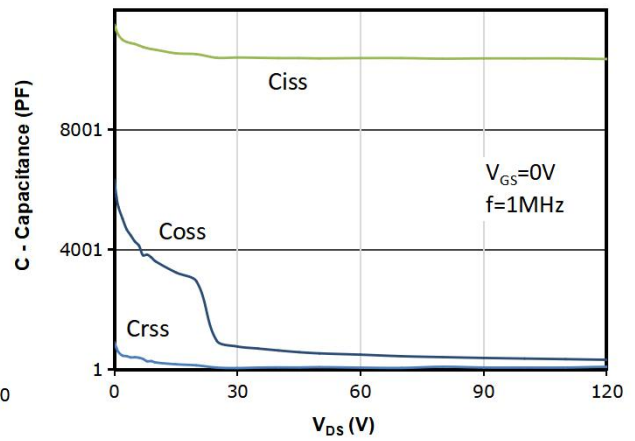


Fig 9: Gate Charge Characteristics

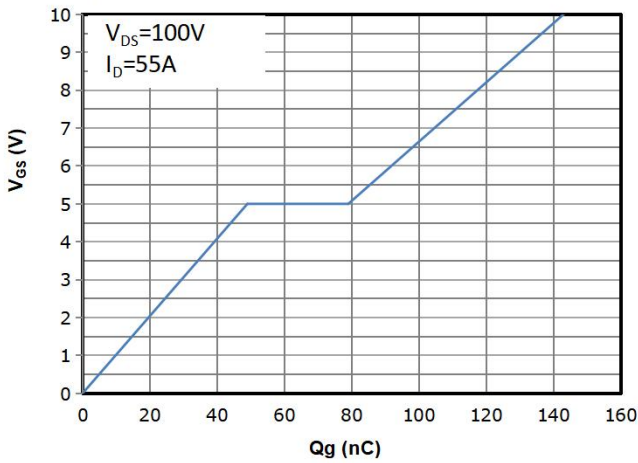


Fig 10: Body-diode Forward Characteristics

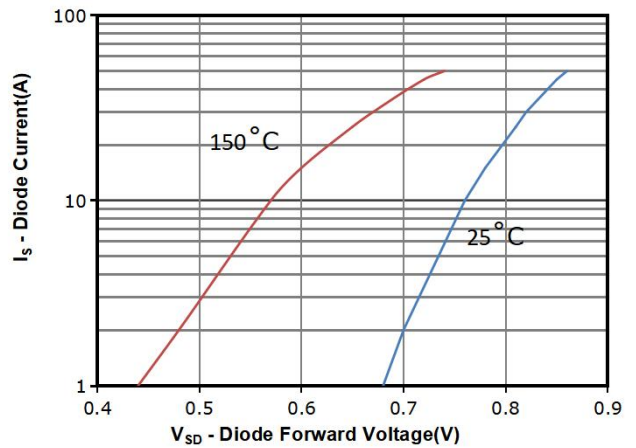


Fig 11: Power Dissipation

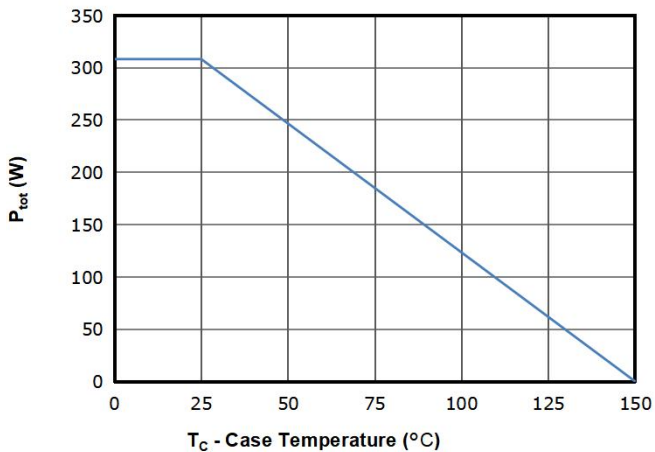


Fig 12: Drain Current Derating

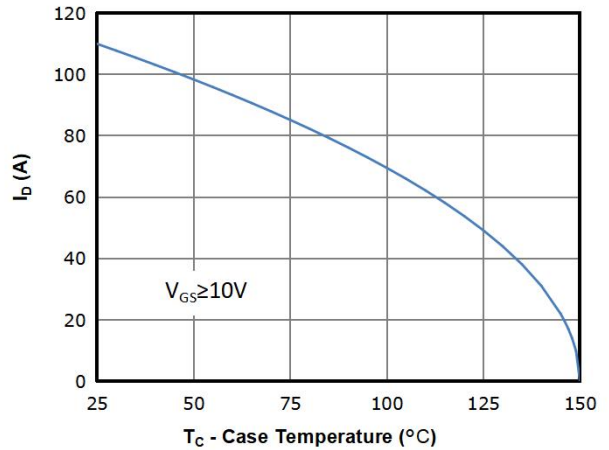




Fig 13: Safe Operating Area

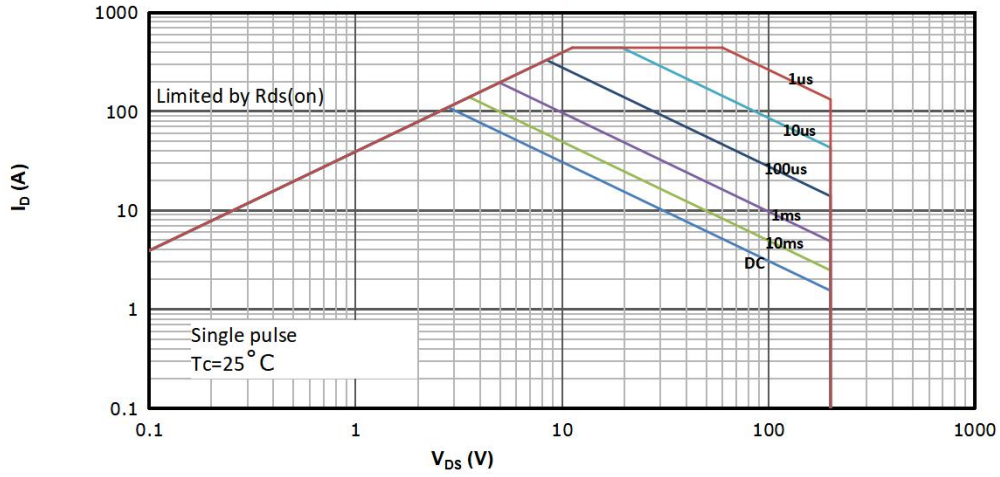
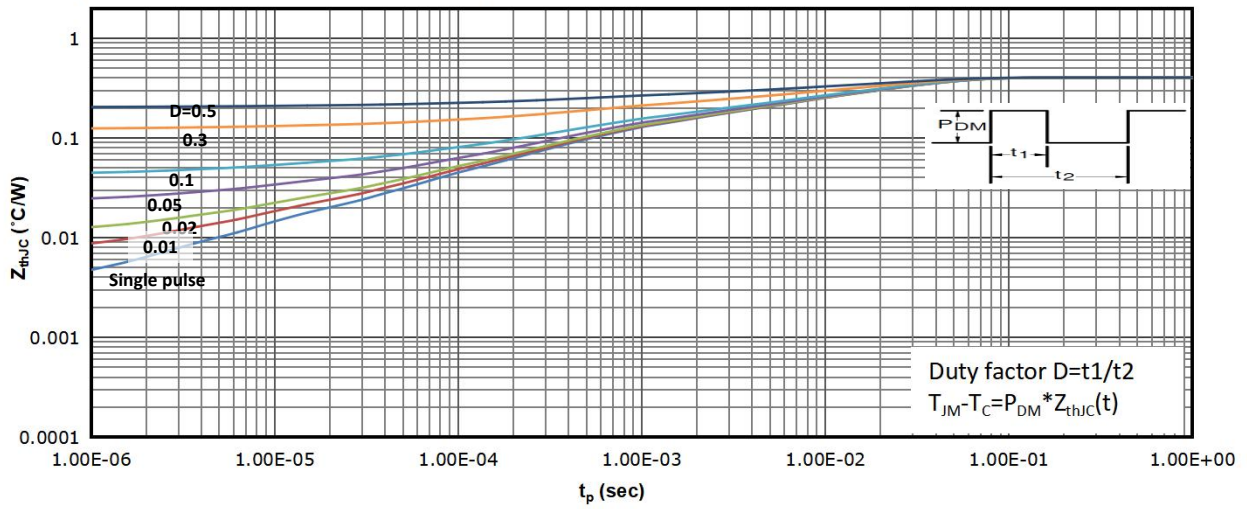


Fig 14: Max. Transient Thermal Impedance

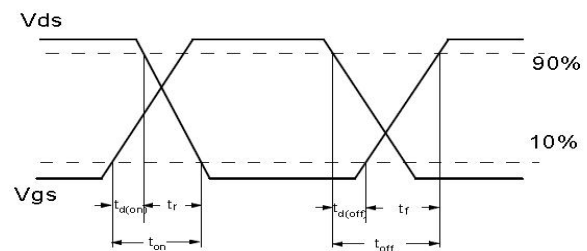


Test Circuit & Waveform

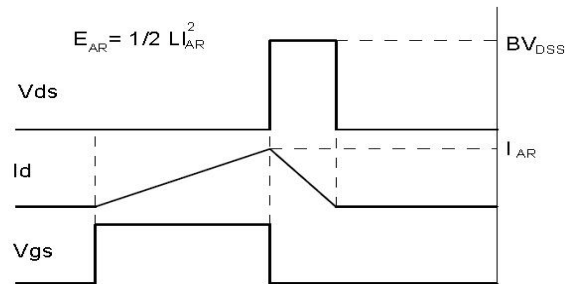
Gate Charge Test Circuit & Waveform



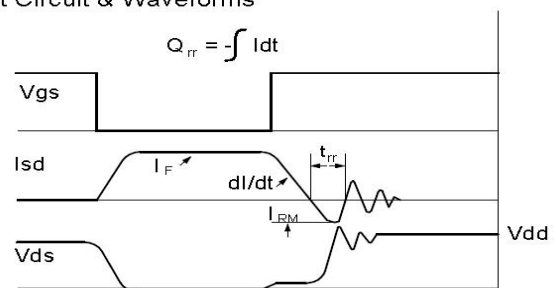
Resistive Switching Test Circuit & Waveforms



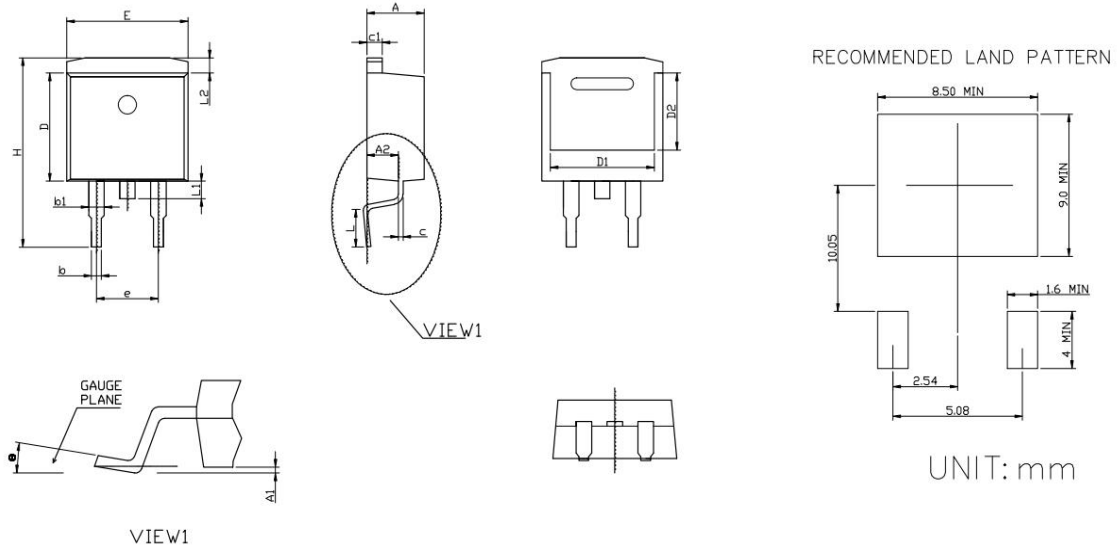
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: TO-263CB-2L



SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.40	4.80	0.173	0.189
A1	0.05	0.30	0.002	0.012
A2	2.25	2.55	0.089	0.100
b	0.72	0.92	0.028	0.036
b1	1.12	1.42	0.044	0.056
c	0.40	0.60	0.016	0.024
c1	1.20	1.40	0.047	0.055
D	8.80	9.40	0.346	0.370
D1	7.75	8.15	0.305	0.321
D2	6.55	6.95	0.258	0.274
E	9.65	10.35	0.380	0.407
e	5.08		0.200	
H	14.70	15.60	0.579	0.614
L	2.30	2.60	0.091	0.102
L1	1.20	1.60	0.047	0.063
L2	0.95	1.30	0.037	0.051
θ	0°	8°	0°	8°



Revision History

Revision	Date	Major changes
1.0	2023/3/7	Release of Formal Version.

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