

VDS	RDS(on)	ID@25°C
650V	30mΩ	55A

Applications:

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- EV Charging
- Motor Drives

Features:

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness

Benefits:

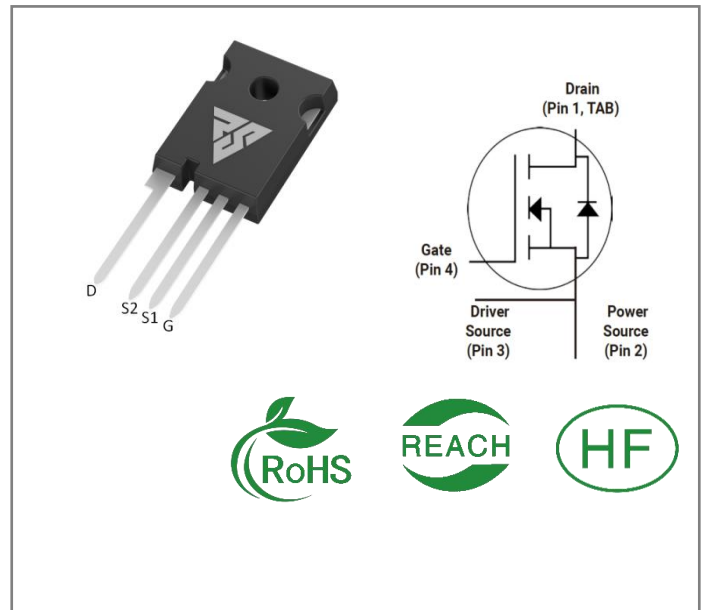
- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

Ordering Information

Part Number	Package	Marking	Packing	Qty.
RSM065030Z	TO-247-4	RSM065030Z	Tube	30 PCS

Maximum Ratings (TJ= 25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
VDSmax	Drain - Source Voltage	650	V	VGS=0V, ID =100μA	
VGSmax	Gate - Source Voltage	-8/+22	V	Absolute maximum values	
VGSop	Gate - Source Voltage	-5/+18	V	Recommended operational values	
ID	Continuous Drain Current	55 39	A	VGS=18V, TC =25°C VGS=18V, TC =100°C	
ID(pulse)	Pulsed Drain Current	197	A	Pulse width tp limited by TJmax	
PD	Power Dissipation	187	W	TC =25°C, TJ =175°C	
TL	Solder Temperature	260	°C		
TJ, Tstg	Operating Junction and Storage Temperature	-40 to +175	°C		



Electrical Characteristics (T_J= 25°C unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
V(BR)DSS	Drain-Source Breakdown Voltage	650			V	V _{GS} =0V, I _D =100μA	
V _{GS(th)}	Gate Threshold Voltage	1.8	2.6	4.0	V	V _{GS} = V _D S, I _D S=5mA, TC =25°C	
			1.8		V	V _{GS} = V _D S, I _D S=5mA, TC =175°C	
I _{DSS}	Zero Gate Voltage Drain Current		1	50	μA	V _D S= 650V, V _{GS} =0V	
I _{GSS}	Gate-Source Leakage Current		10	250	nA	V _{GS} =22V, V _D S= 0V	
R _{DS(on)}	Drain-Source on-state Resistance		30	50	mΩ	V _{GS} =18V, I _D =25A, TC =25°C	
			42			V _{GS} =18V, I _D =25A, TC =175°C	
C _{iss}	Input Capacitance		1850		pF	V _{GS} =0V, V _D S=400 V, f=1MHz, V _{AC} =25 mV	
C _{oss}	Output Capacitance		160				
C _{rss}	Reverse Transfer Capacitance		15				
E _{ON}	Turn-On Switching Energy		50		μJ	V _D S =400V, V _{GS} =-5/18V, I _D = 25A, R _{G(ext)} = 2.5Ω, L= 100μH	
E _{OFF}	Turn-Off Energy		65				
t _{d(on)}	Turn-On Delay Time		14		ns	V _D S =400V, V _{GS} =-5/18 V, I _D = 25A, R _{G(ext)} =2.5 Ω, R _L =16Ω	
t _r	Rise Time		15				
t _{d(off)}	Turn-Off Delay Time		28				
t _f	Fall Time		8				
R _{G(int)}	Internal Gate Resistance		3		Ω	f=1 MHz, V _{AC} =25mV	
Q _{gs}	Gate to Source Charge		30		nC	V _D S=400V, V _{GS} =-5/18V, I _D = 5A	
Q _{gd}	Gate to Drain Charge		32		nC		
Q _g	Total Gate Charge		110				

Reverse Diode Characteristics (T_J= 25°C unless otherwise specified)

Symbol	Parameter	Typ.	Max	Unit	Test Conditions	Note
VSD	Diode Forward Voltage	4.2		V	V _{GS} =-5V, I _{SD} = 12.5 A, T _J = 25°C	
		3.8		V	V _{GS} =-5V, I _{SD} =12.5 A, T _J = 175°C	
I _S	Continuous Diode Forward Current		45	A	V _{GS} =-5V, T _C = 25°C	
t _{rr}	Reverse Recovery time	25		ns	I _{SD} = 25 A, V _R = 400V	
Q _{rr}	Reverse Recovery Charge	100		nC		
I _{rrm}	Peak Reverse Recovery Current	5		A		

Thermal Characteristics (T_J= 25°C unless otherwise specified)

Symbol	Parameter	Typ.	Unit	Test Conditions	Note
R _{θJC}	Thermal Resistance from Junction to Case	0.8	°C/W		
R _{θJA}	Thermal Resistance From Junction to Ambient	40			

Typical Feature Curve

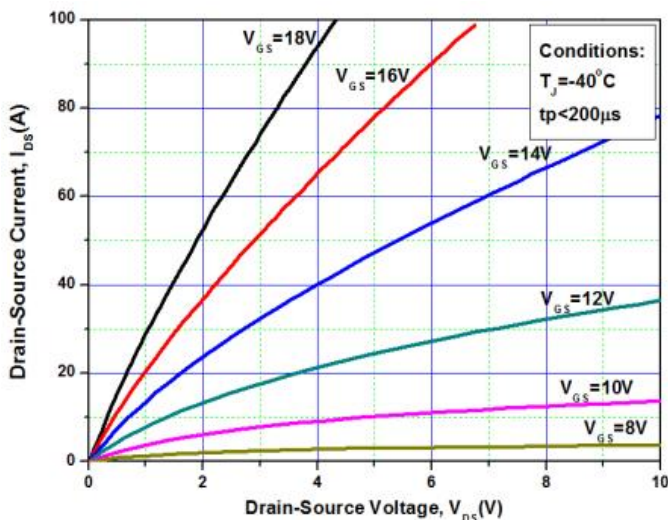


Figure 1. Output Characteristics T_J = -40°C

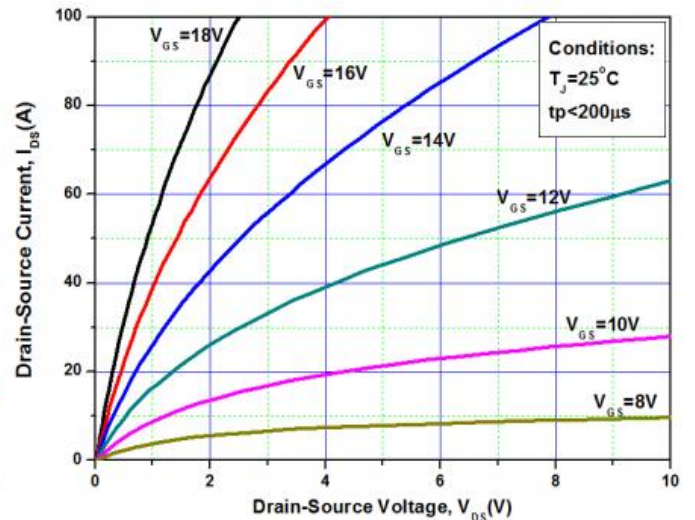


Figure 2. Output Characteristics T_J = 25°C

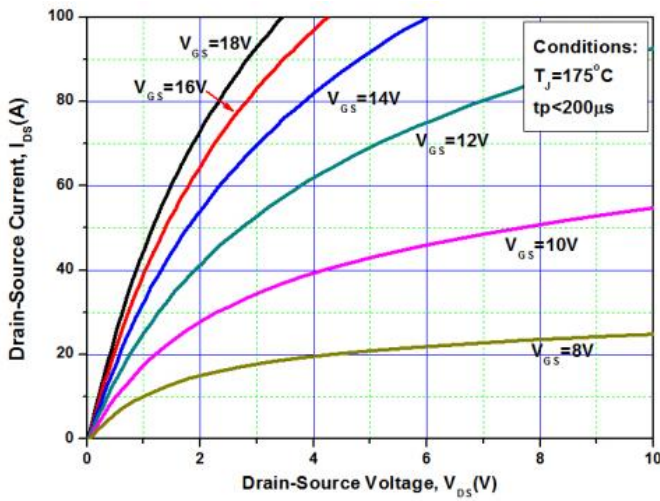


Figure 3. Output Characteristics $T_J = 175^\circ\text{C}$

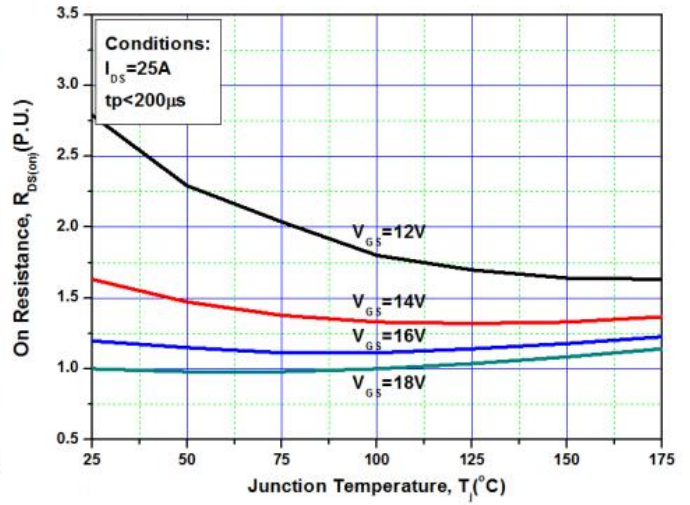


Figure 4. Normalized On-Resistance vs. Temperature

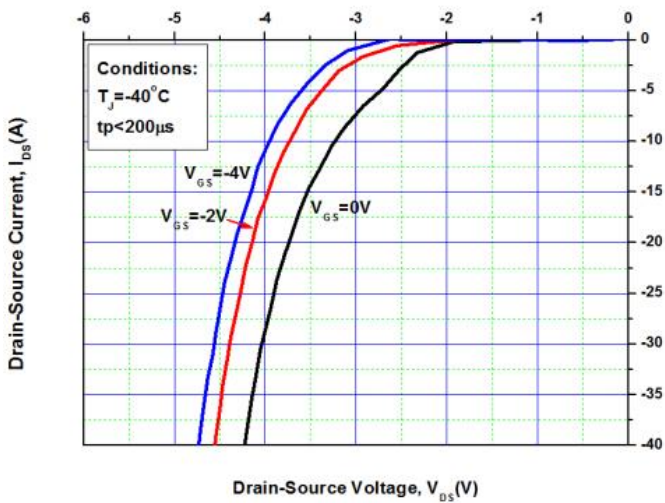


Figure 5. Body Diode Characteristic at -40°C

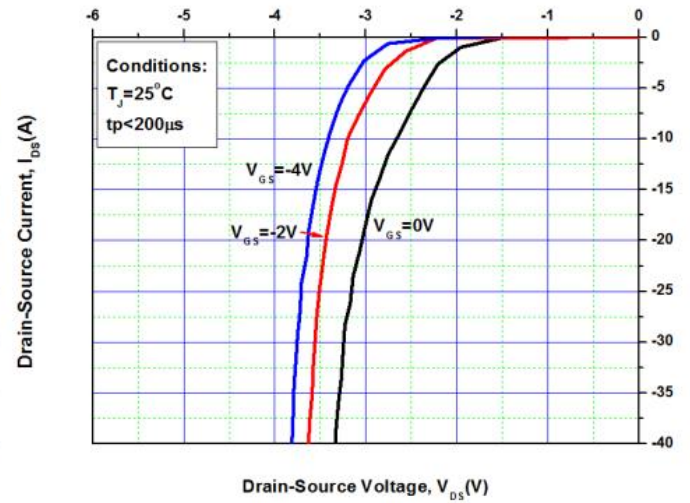


Figure 6. Body Diode Characteristic at 25°C

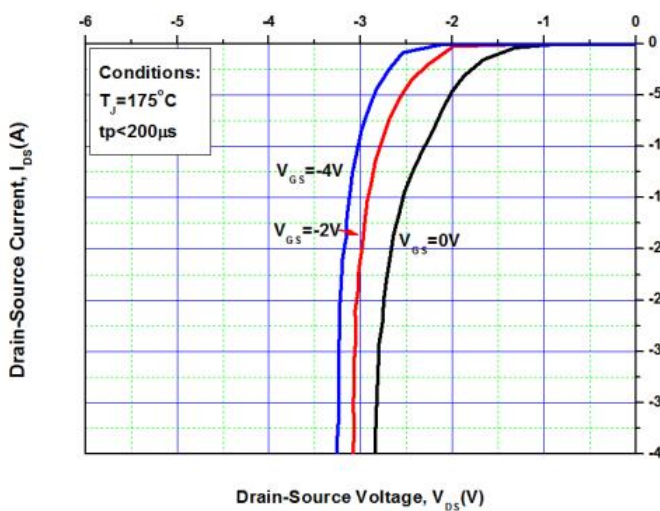


Figure 7. Body Diode Characteristic at 175°C

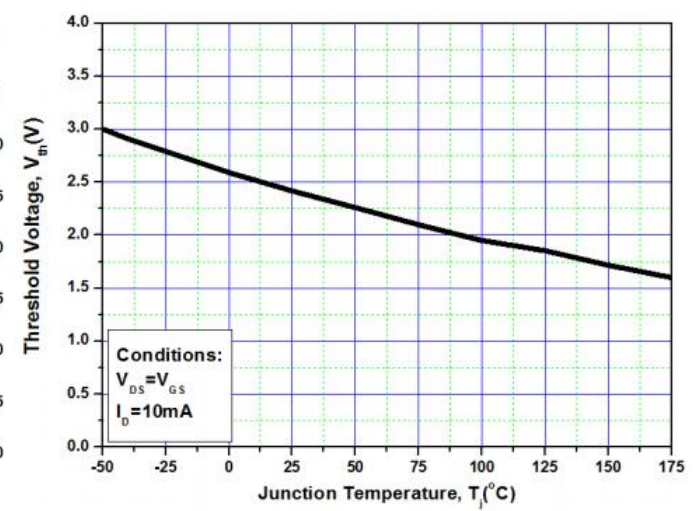


Figure 8. Threshold Voltage vs. Temperature

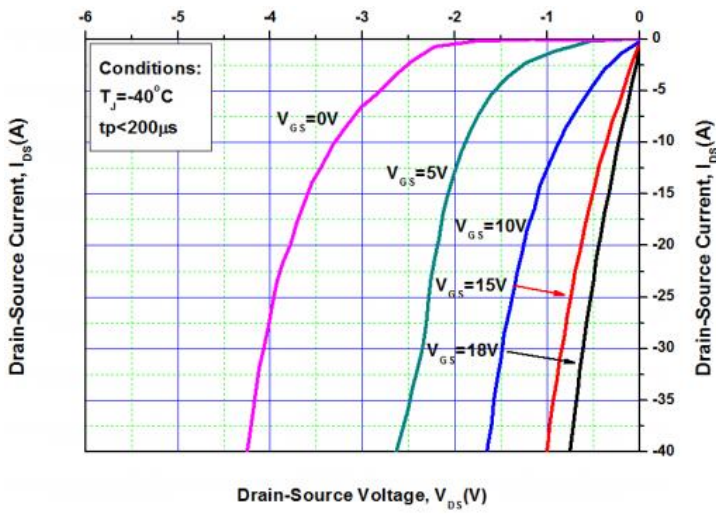


Figure 9. 3rd Quadrant Characteristic at -40°C

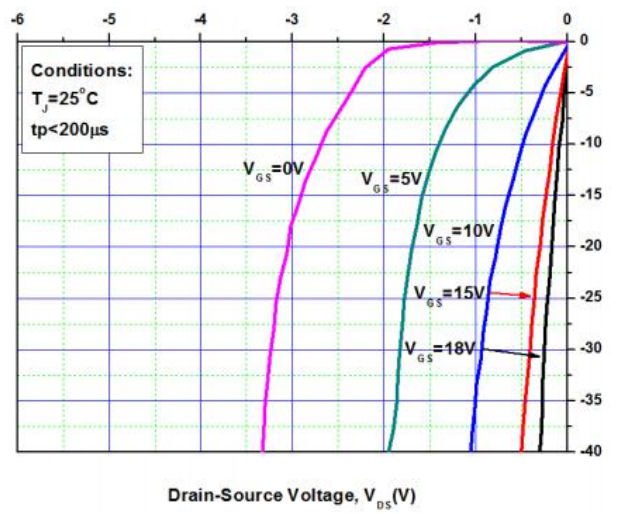


Figure 10. 3rd Quadrant Characteristic at 25°C

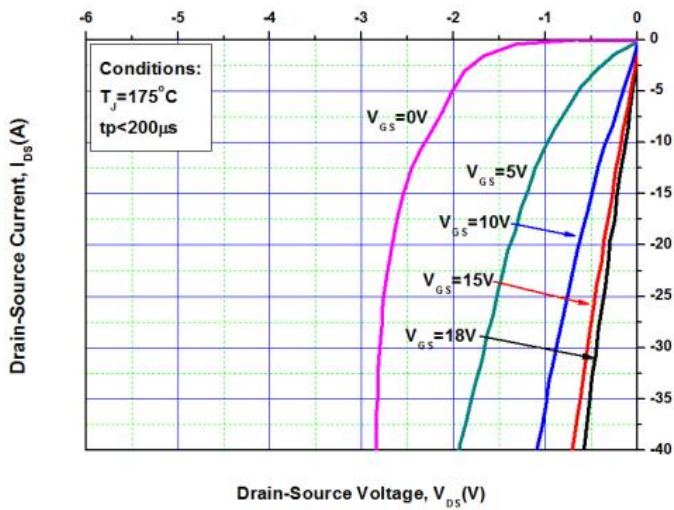


Figure 11. 3rd Quadrant Characteristic at 175°C

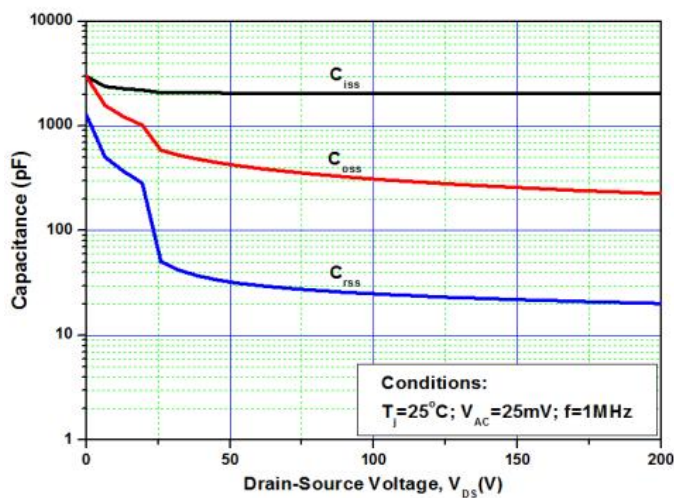


Figure 12. Capacitances vs. Drain-Source Voltage (0 - 200V)

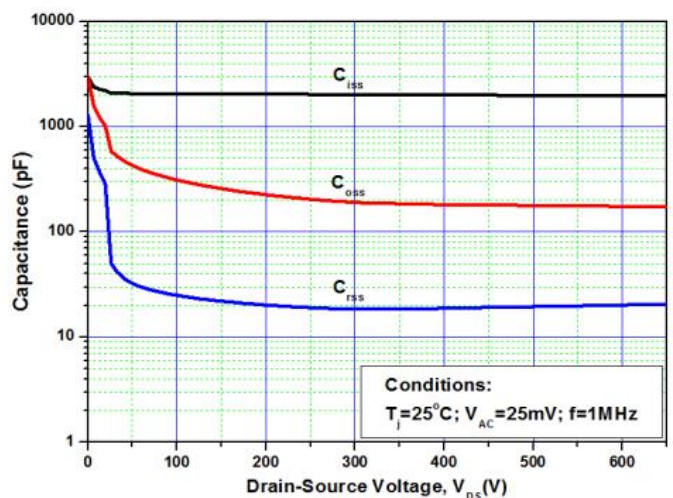
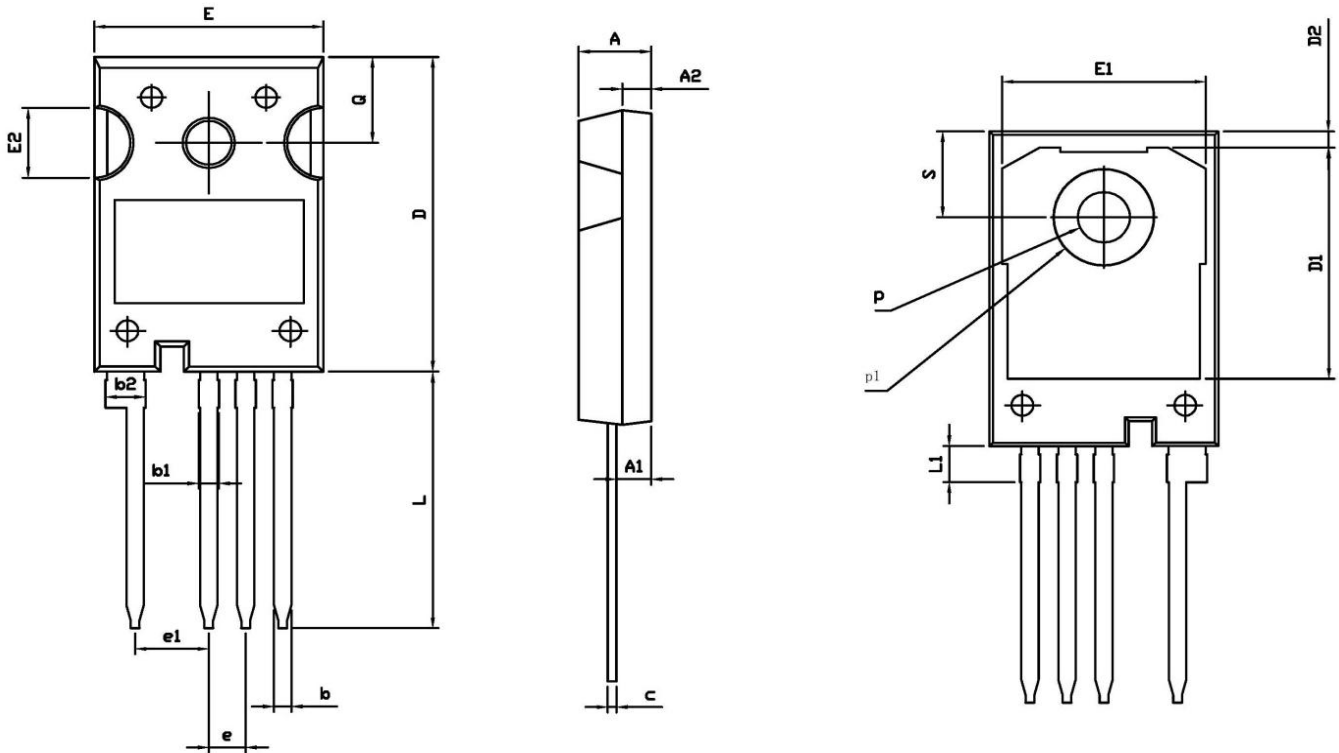
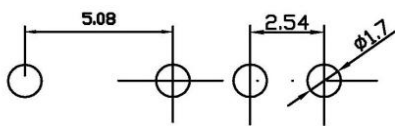


Figure 13. Capacitances vs. Drain-Source Voltage (0 - 650V)

Package outline drawing(TO-247-4 Unit: mm)



RECOMMENDED LAND PATTERN



UNIT: mm

	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.25	2.40	2.45
A2	1.85	2.00	2.15
b	1.05	1.20	1.35
b1	1.00	1.30	1.60
b2	2.35	2.65	2.95
c	0.50	0.60	0.70
D	22.34	22.54	22.74
D1	16.00	16.50	17.00
D2	0.97	1.17	1.37
e	2.34	2.54	2.74
e1	4.88	5.08	5.28
E	15.60	15.80	16.00
E1	13.50	14.00	14.50
E2	4.80	5.00	5.20
L	18.08	18.38	18.68
L1	2.38	2.58	2.78
p	3.50	3.60	3.70
p1	6.60	6.80	7.00
Q	6.00	6.15	6.30
S	6.00	6.15	6.30

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