

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D@25^{\circ}C$
650V	30mΩ@18V	92A

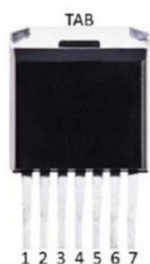
Feature

- High Blocking Voltage With Low On-Resistance
- High Speed Switching With Low Capacitance
- Easy to Parallel and Simple to Drive

Application

- Renewable Energy
- EV Battery Chargers
- High Voltage DC/DC Converters
- Switch Mode Power Supplies

Package

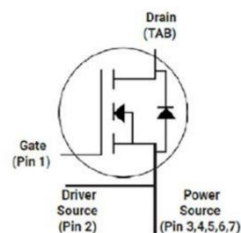


TO-263-7

Marking



Circuit diagram



Absolute maximum ratings ($T_c=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Test Condition	Value	Unit
Drain-Source Voltage	V_{DSmax}	$V_{GS} = 0V, I_D = 100\mu A$	650	V
Gate-Source Voltage	V_{GSmax}	Absolute maximum values	-8/+22	V
Gate-Source Voltage	V_{GSOP}	Recommended operational values	-4/+18	V
Continuous Drain Current	I_D	$V_{GS}=18V, T_C=25^{\circ}C$	92	A
	I_D	$V_{GS}=18V, T_C=100^{\circ}C$	64	A
Power Dissipation	P_D	$T_C=25^{\circ}C$	312	W
Thermal Resistance (Typ)	$R_{\theta JC}$	Junction-to-Case	0.48	$^{\circ}C/W$
Junction Temperature	T_J		-55 ~ +175	$^{\circ}C$
Storage Temperature	T_{STG}		-55 ~ +175	$^{\circ}C$

Electrical characteristics (T_c=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =100μA	650			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =650V,V _{GS} = 0V		1	100	μA
Gate-Source leakage current	I _{GSS+}	V _{GS} =22V, V _{DS} = 0V		10	250	nA
Gate-Source leakage current	I _{GSS-}	V _{GS} =-8V, V _{DS} = 0V		10	250	
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =15mA	1.9	2.6	4.0	V
		V _{DS} =V _{GS} , I _D =15mA ,T _J =175℃		1.8		
Drain-source on-resistance	R _{DS(on)}	V _{GS} =18V, I _D =50A		20	30	mΩ
		V _{GS} =18V, I _D =50A,T _J =175℃		28		
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =600V,V _{GS} =0V,f =1MHz V _{AC} =25mV		3180		pF
Output Capacitance	C _{oss}			281		
Reverse Transfer Capacitance	C _{rss}			33		
Turn-on Switching Energy	E _{on}	V _{DS} =400V,V _{GS} =-4V/18V, I _D =40A,R _{G(ext)} =2.5Ω,L=100μH		0.52		mJ
Turn-off Switching Energy	E _{off}			0.7		
Total Gate Charge	Q _g	V _{DS} =400V,V _{GS} =-4V/18V, I _D =40A		187		nC
Gate-Source Charge	Q _{gs}			49		
Gate-Drain Charge	Q _{gd}			31		
Turn-on delay time	t _{d(on)}	V _{DS} =400V,V _{GS} =-4V/18V, I _D =40A,R _{G(ext)} =2.5Ω,R _L =20Ω		17		nS
Turn-on rise time	t _r			15		
Turn-off delay time	t _{d(off)}			65		
Turn-off fall time	t _f			14		
Source-Drain Diode characteristics						
Diode Forward Current	I _S	T _C =25℃			92	A
Diode Forward voltage	V _{SD}	V _{GS} =-4V, I _{SD} =25A		4.2		V
		V _{GS} =-4V, I _{SD} =25A,T _J =175℃		3.9		
Reverse Recovery Time	t _{rr}	I _{SD} =40A,V _R =400V		26		nS
Reverse Recovery Charge	Q _{rr}			58		nC
Peak Reverse Recovery Current	I _{rrm}			3.4		A

Typical Characteristics

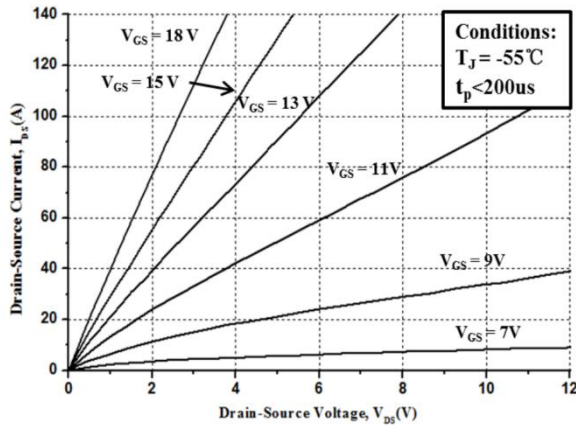


Figure 1. Output Characteristics $T_J = -55^\circ\text{C}$

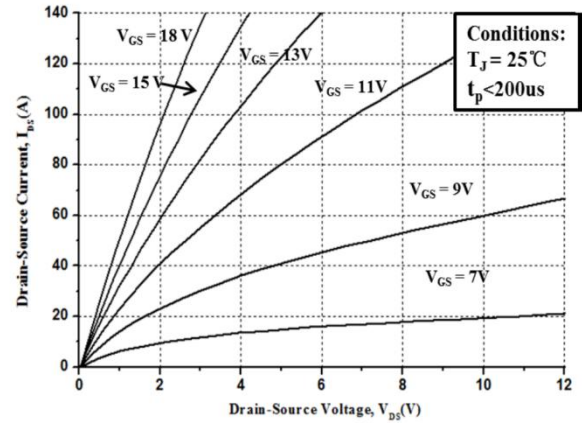


Figure 2. Output Characteristics $T_J = 25^\circ\text{C}$

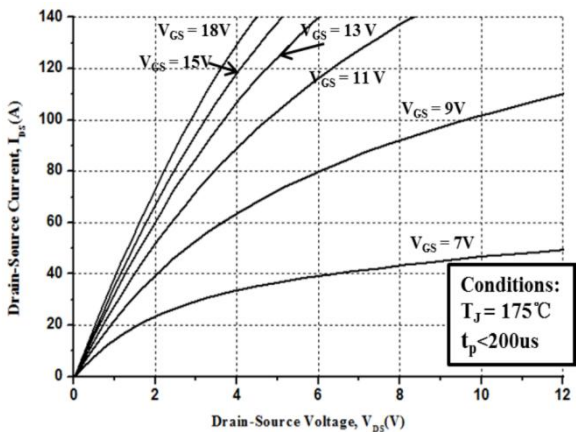


Figure 3. Output Characteristics $T_J = 175^\circ\text{C}$

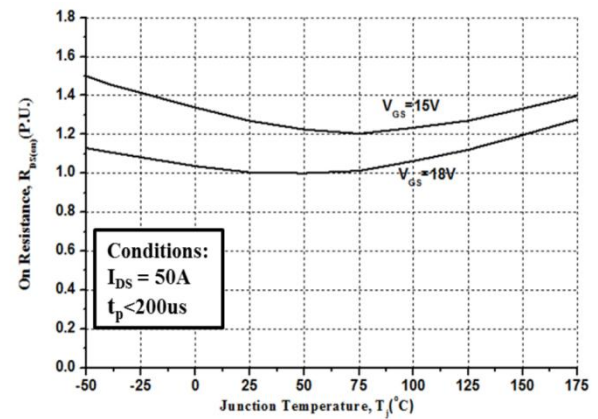


Figure 4. Normalized On-Resistance vs. Temperature

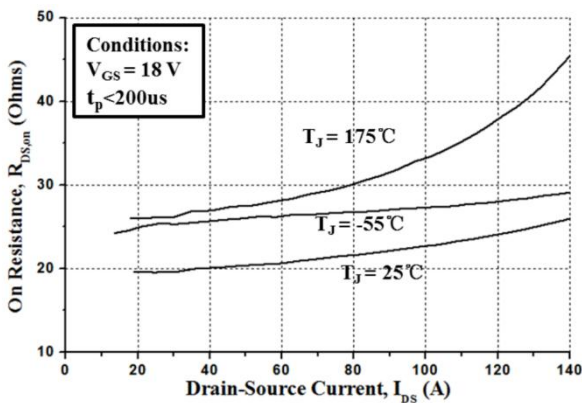


Figure 5. On-Resistance vs. Drain Current
For Various Temperatures

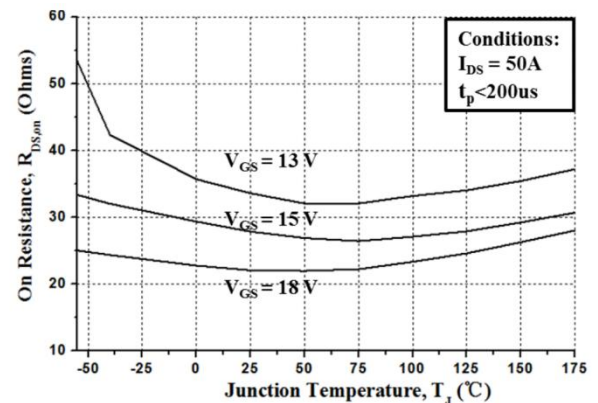


Figure 6. On-Resistance vs. Temperature
For Various Gate Voltage

Typical Characteristics

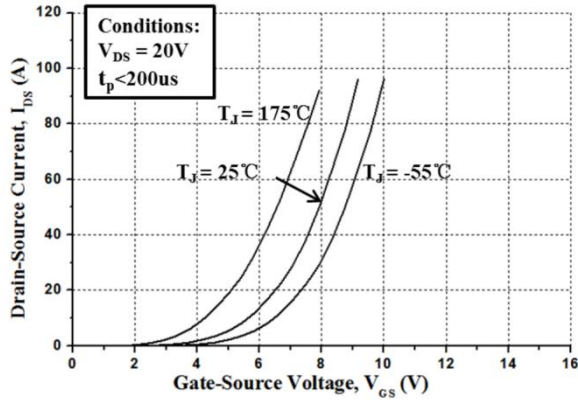


Figure 7. Transfer Characteristic for Various Junction Temperatures

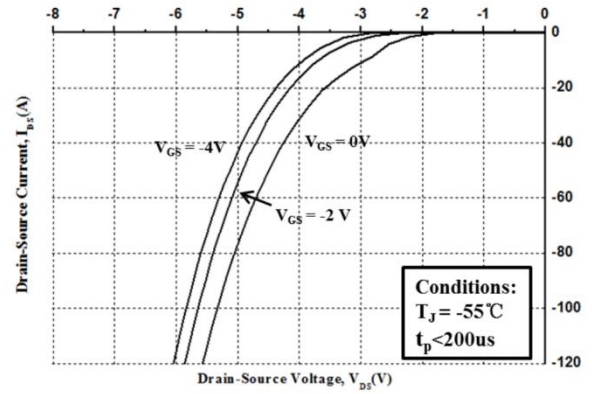


Figure 8. Body Diode Characteristic at $-55^\circ C$

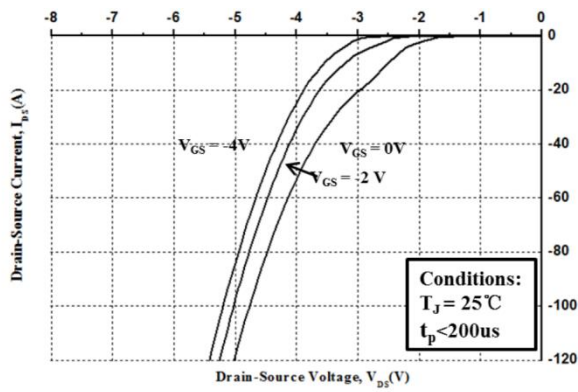


Figure 9. Body Diode Characteristic at $25^\circ C$

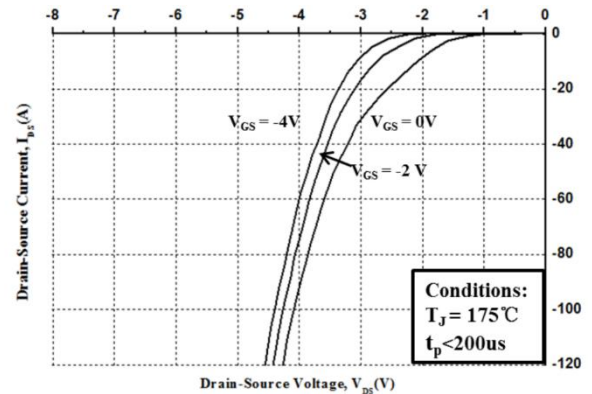


Figure 10. Body Diode Characteristic at $175^\circ C$

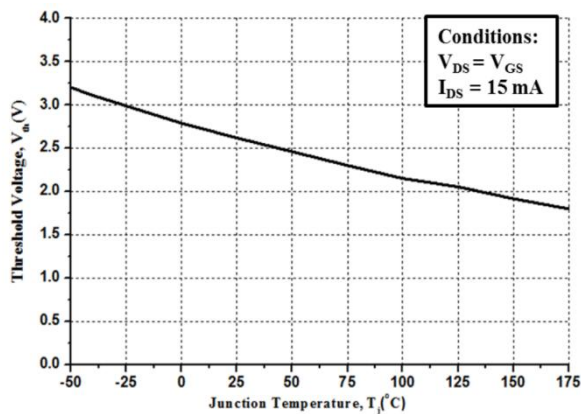


Figure 11. Threshold Voltage vs. Temperature

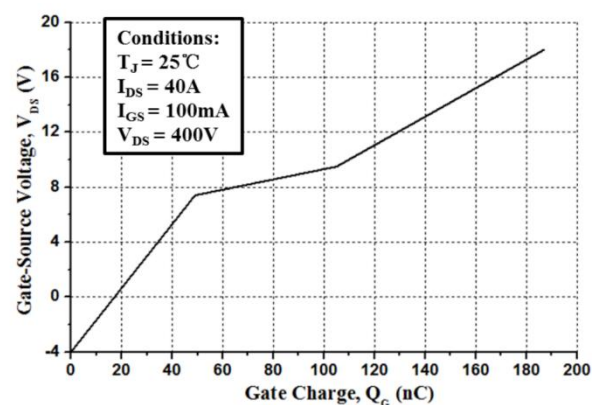


Figure 12. Gate Charge Characteristics

Typical Characteristics

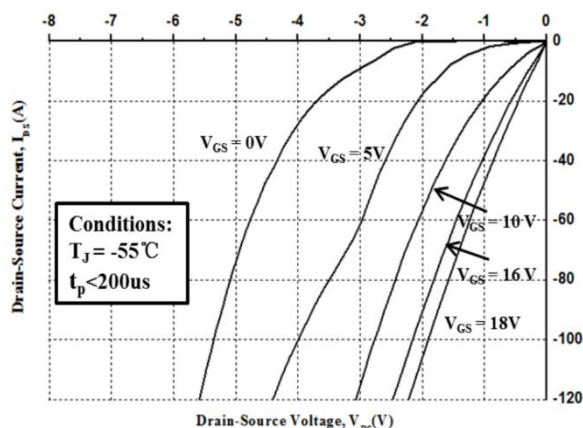


Figure 13. 3rd Quadrant Characteristic at -55°C

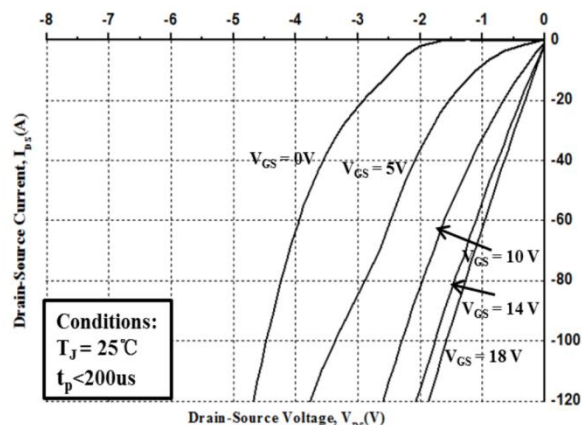


Figure 14. 3rd Quadrant Characteristic at 25°C

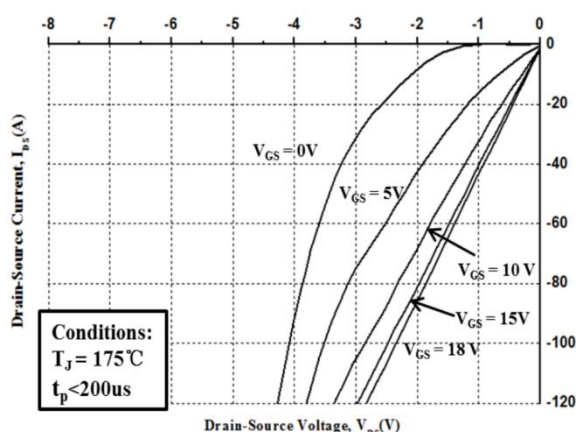


Figure 15. 3rd Quadrant Characteristic at 175 °C

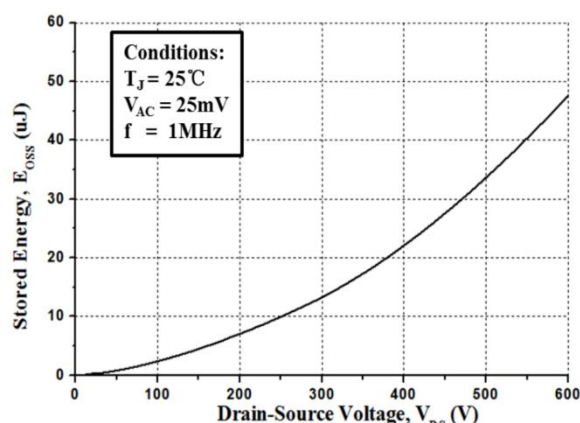


Figure 16. Output Capacitor Stored Energy

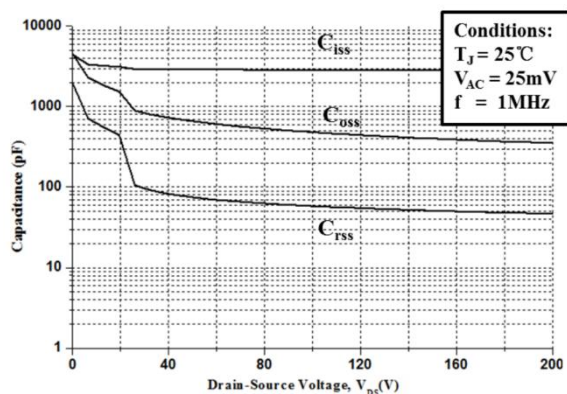


Figure 17. Capacitances vs. Drain-Source Voltage (0 - 200V)

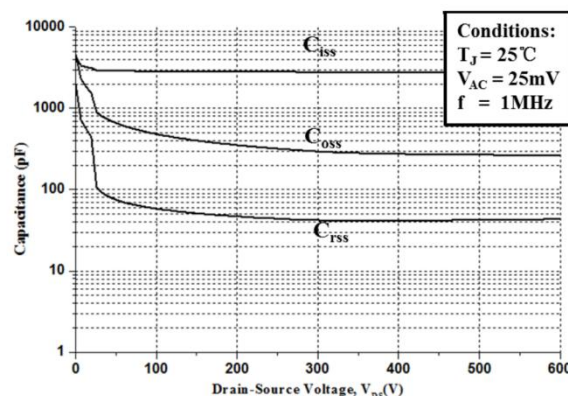


Figure 18. Capacitances vs. Drain-Source Voltage (0 - 1000V)

Typical Characteristics

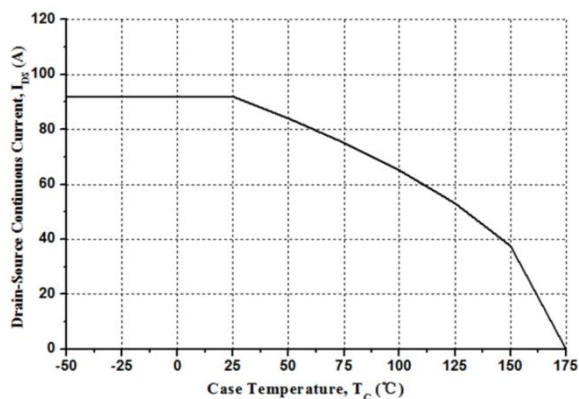


Figure 19. Continuous Drain Current Derating vs. Case Temperature

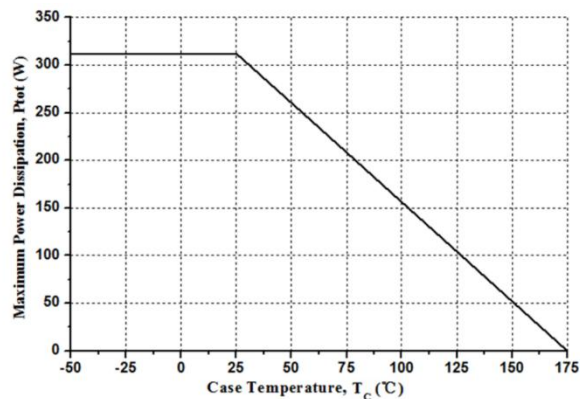


Figure 20. Maximum Power Dissipation Derating vs. Case Temperature

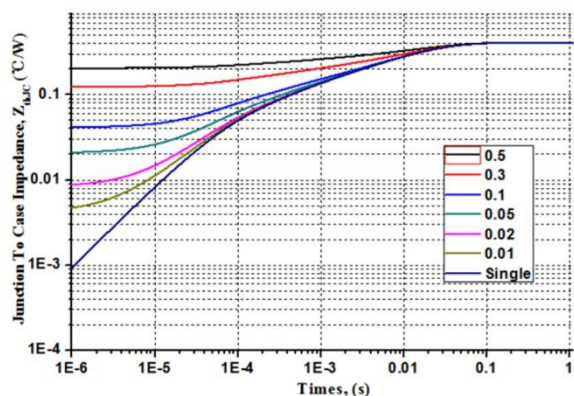


Figure 21. Transient Thermal Impedance (Junction - Case)

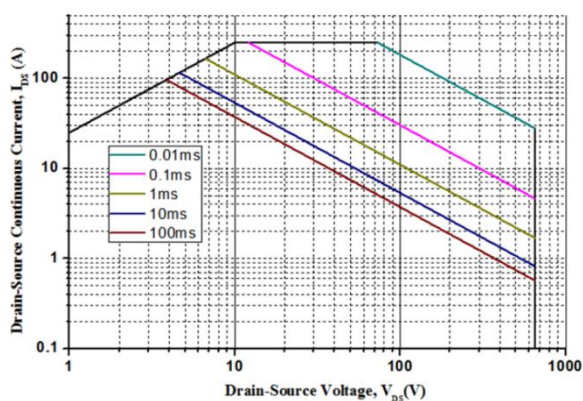
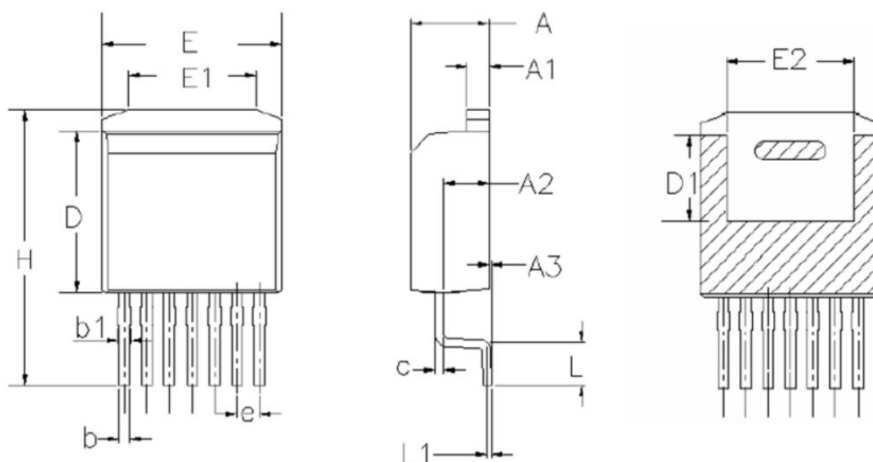


Figure 22. Safe Operating Area

TO-263-7 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.300	4.600	0.169	0.181
A1	1.200	1.400	0.047	0.055
A2	2.400	2.700	0.094	0.106
A3	0.000	0.250	0.000	0.010
b	0.500	0.700	0.020	0.028
b1	0.600	0.900	0.024	0.035
c	0.400	0.600	0.016	0.024
D	8.880	9.280	0.350	0.365
D1	4.650	6.650	0.183	0.262
e	1.270 BSC		0.050 BSC	
E	10.080	10.280	0.397	0.405
E1	6.500	8.300	0.256	0.327
E2	6.820	7.97	0.269	0.314
H	14.800	16.000	0.583	0.630
L	1.900	2.750	0.075	0.108