

Product Summary

BV_{DSS}	R_{DS(ON)}	I_D T_C = +25°C
100V	5mΩ @V _{GS} = 10V	140A

Description

This new generation MOSFET features low on-resistance and fast switching, making it ideal for high-efficiency power management applications.

Applications

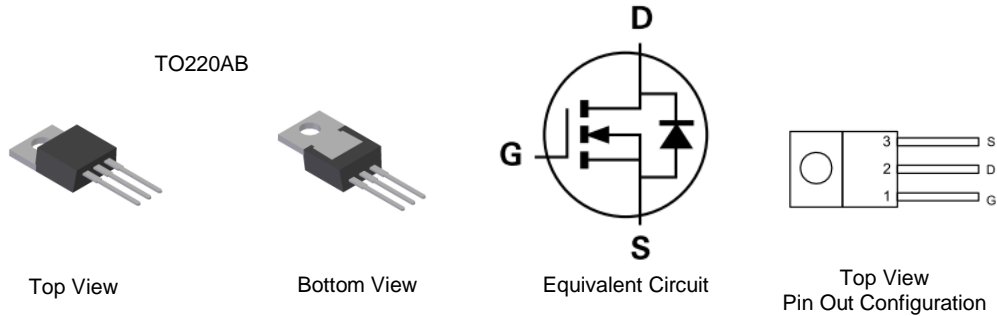
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

Features

- Rated to +175°C – Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching – Ensures More Reliable and Robust End Application
- Low Input Capacitance
- High BV_{DSS} Rating for Power Application
- Low Input/Output Leakage
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**

Mechanical Data

- Case: TO220AB
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Terminal Connections: See Diagram Below
- Weight: 1.85 grams (Approximate)



Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH10H005SCT	TO220AB	50 Pieces/Tube

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



- ⓁⓂ = Manufacturer's Marking
- TH1H005S = Product Type Marking Code
- YYWW = Date Code Marking
- YY or YY = Last Two Digits of Year (ex: 17 = 2017)
- WW or WW = Week Code (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	100	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current	I _D	140 99	A
		T _C = +25°C T _C = +100°C	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	400	A
Maximum Continuous Body Diode Forward Current	I _S	100	A
		T _C = +25°C	
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)	I _{SM}	400	A
Avalanche Current, L = 3mH (Note 7)	I _{AS}	19	A
Avalanche Energy, L = 3mH (Note 7)	E _{AS}	542	mJ
Avalanche Current, L = 0.1mH	I _{AS}	25	A
Avalanche Energy, L = 0.1mH	E _{AS}	31.2	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	2.9	W
		T _A = +25°C	
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	51	°C/W
Total Power Dissipation	P _D	187	W
		T _C = +25°C	
Thermal Resistance, Junction to Case	R _{θJC}	0.8	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +175	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	100	—	—	V	V _{GS} = 0V, I _D = 1mA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 80V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(TH)}	2	—	4	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	3.8	5	mΩ	V _{GS} = 10V, I _D = 13A
Diode Forward Voltage	V _{SD}	—	—	1.3	V	V _{GS} = 0V, I _S = 13A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{ISS}	—	8,474	—	pF	V _{DS} = 50V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{OSS}	—	1,608	—		
Reverse Transfer Capacitance	C _{RSS}	—	78	—		
Gate Resistance	R _g	—	0.41	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _G	—	111.7	—	nC	V _{DD} = 50V, I _D = 13A, V _{GS} = 10V
Gate-Source Charge	Q _{GS}	—	28.9	—		
Gate-Drain Charge	Q _{GD}	—	21.3	—		
Turn-On Delay Time	t _{D(ON)}	—	29.9	—	ns	V _{DD} = 50V, V _{GS} = 10V, I _D = 13A, R _g = 6Ω
Turn-On Rise Time	t _r	—	30.3	—		
Turn-Off Delay Time	t _{D(OFF)}	—	79.7	—		
Turn-Off Fall Time	t _f	—	41.6	—		
Reverse Recovery Time	t _{RR}	—	70	—	ns	I _F = 13A, di/dt = 100A/µs
Reverse Recovery Charge	Q _{RR}	—	181	—	nC	

- Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
6. Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to product testing.

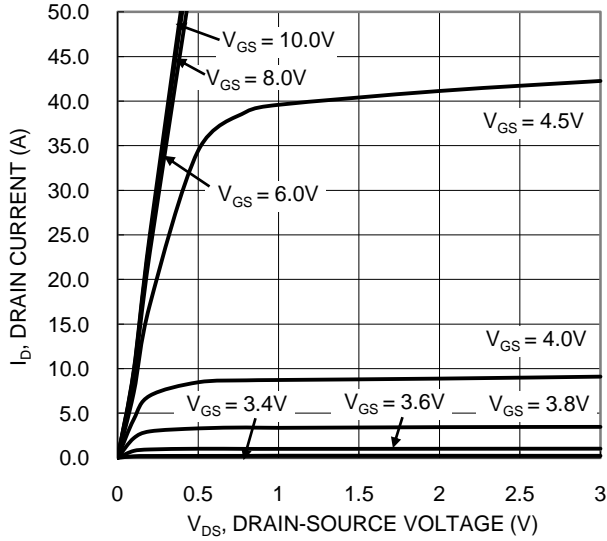


Figure 1. Typical Output Characteristic

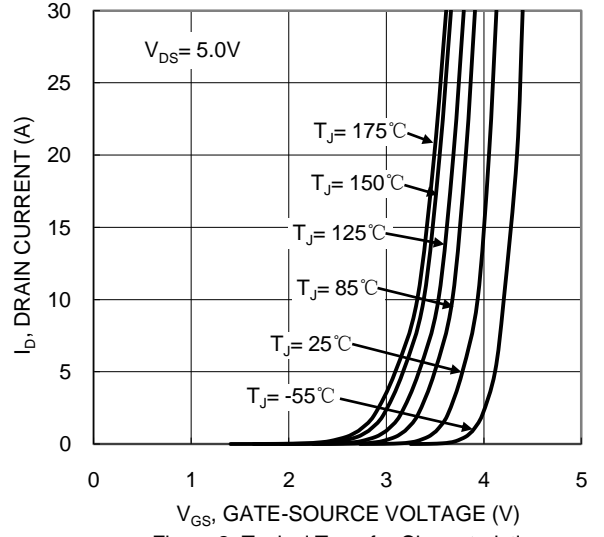


Figure 2. Typical Transfer Characteristic

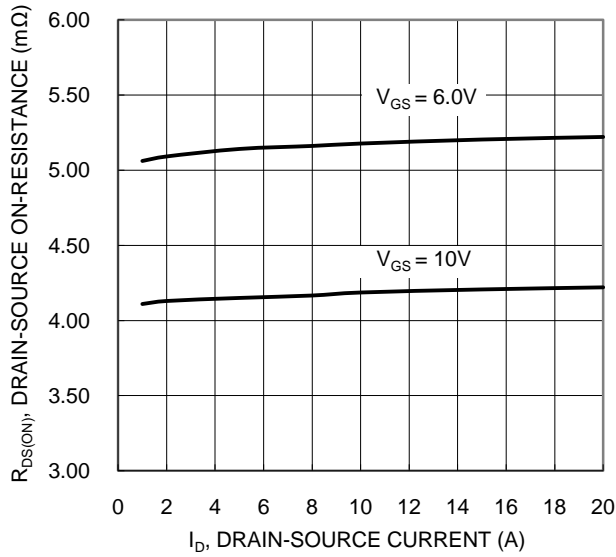


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

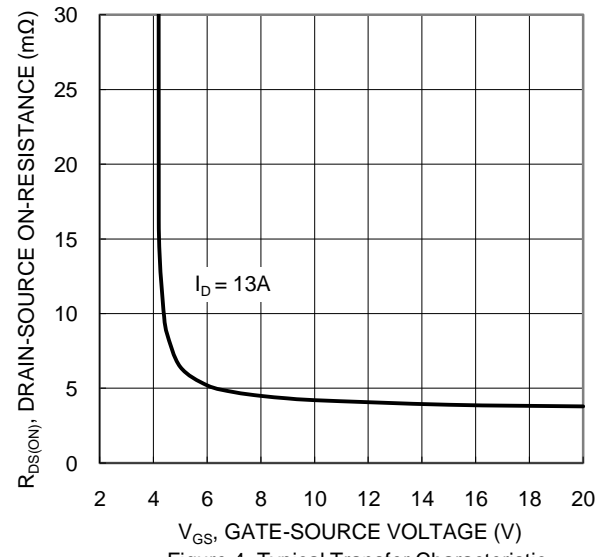


Figure 4. Typical Transfer Characteristic

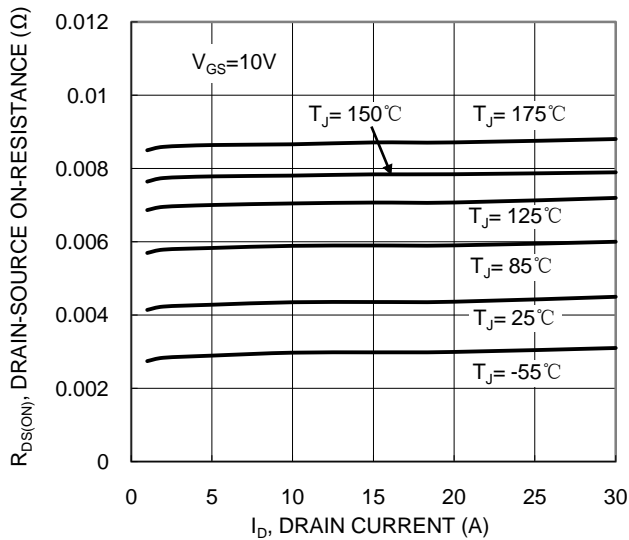


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

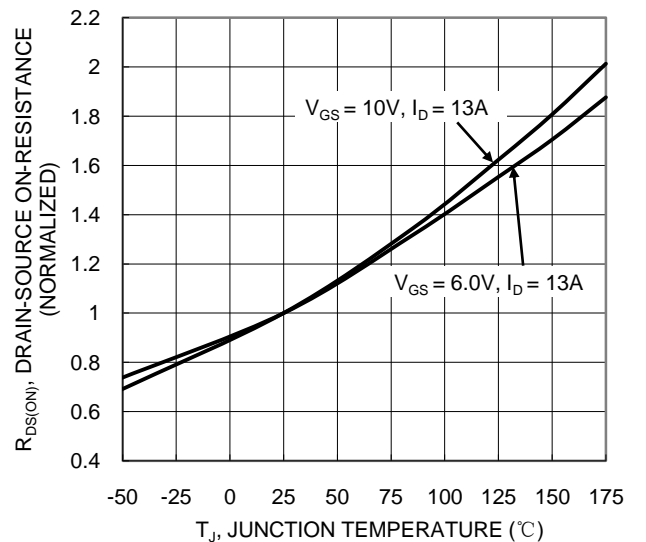
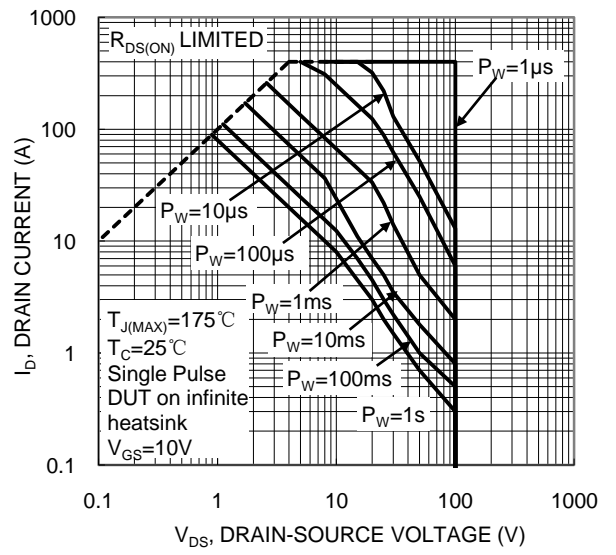
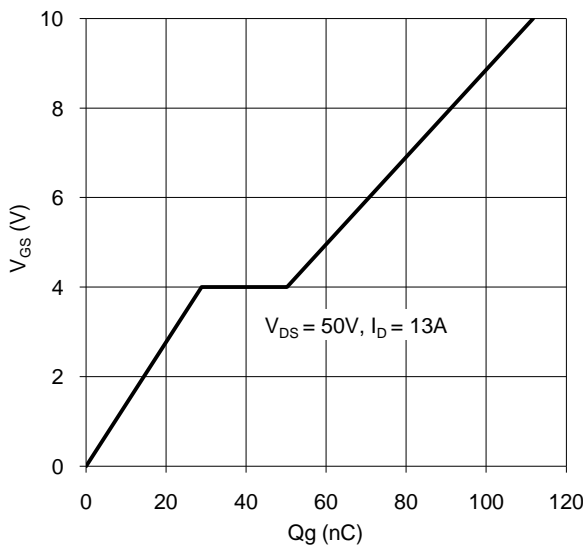
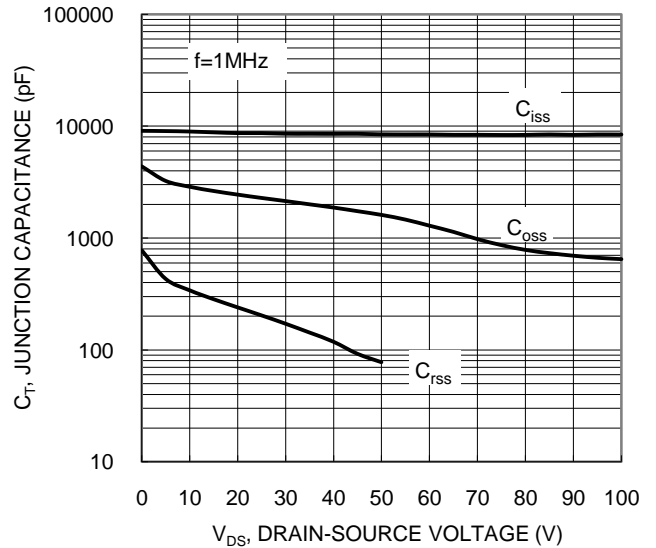
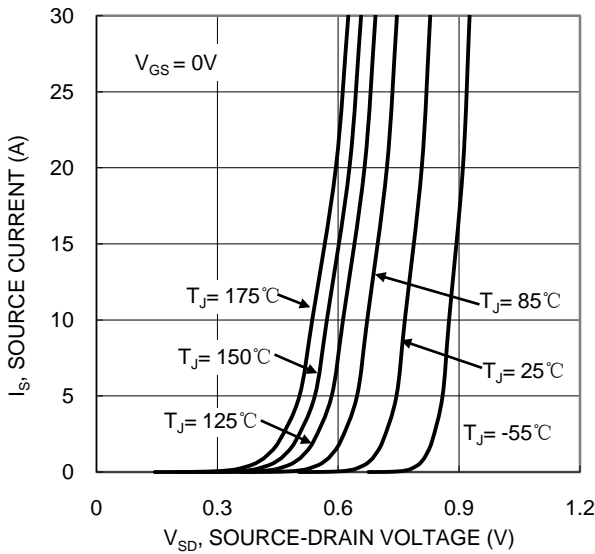
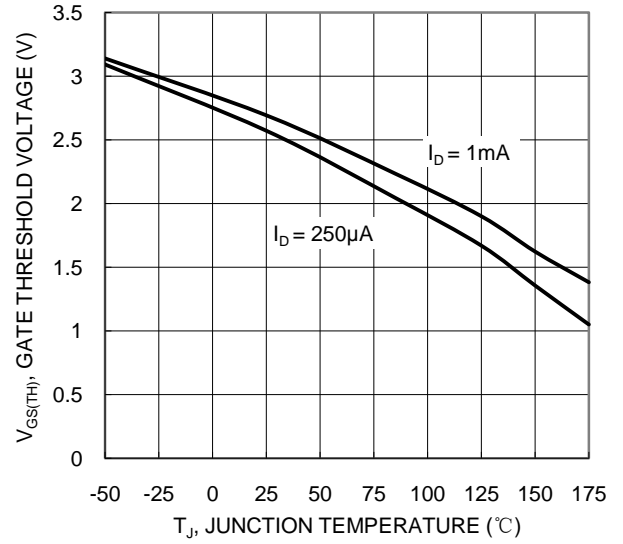
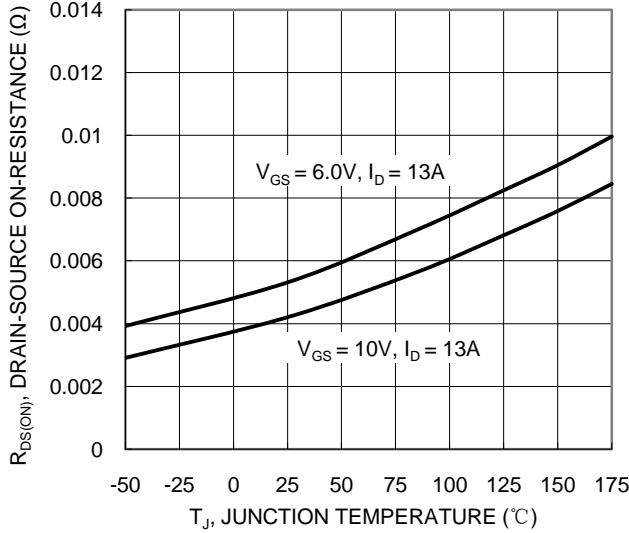


Figure 6. On-Resistance Variation with Temperature



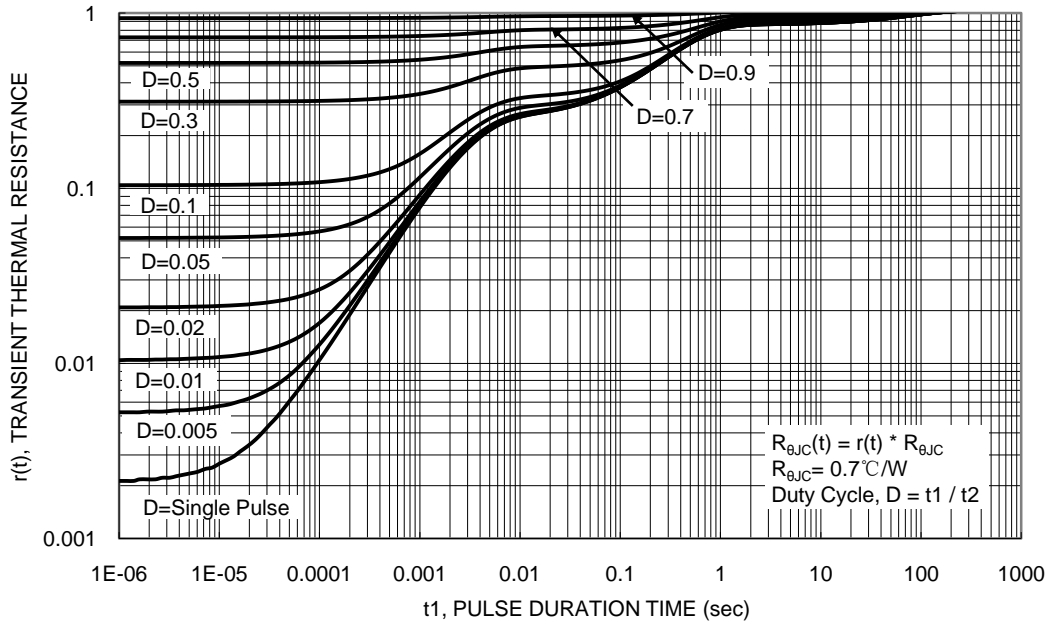
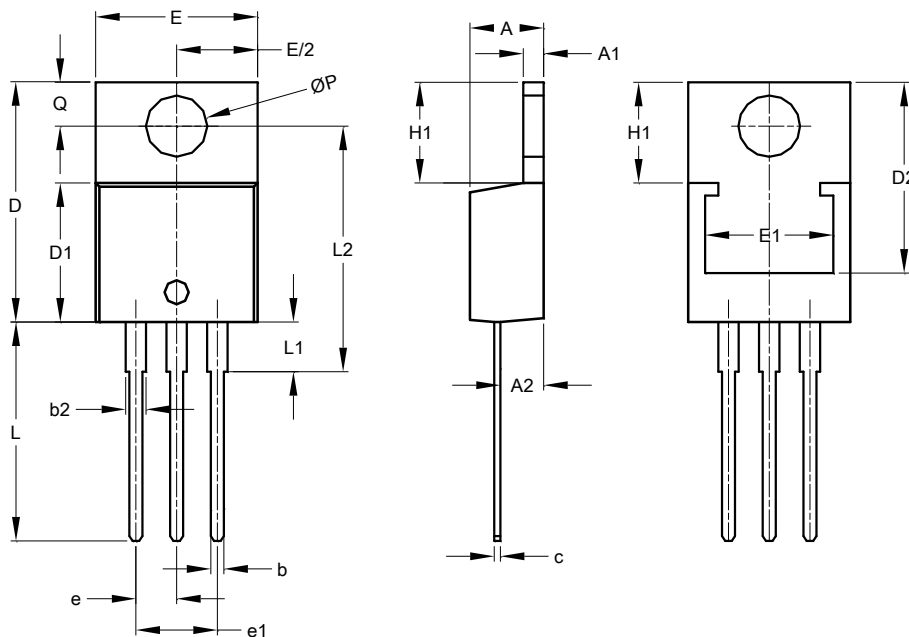


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

TO220AB



TO220AB			
Dim	Min	Max	Typ
A	3.56	4.82	-
A1	0.51	1.39	-
A2	2.04	2.92	-
b	0.39	1.01	0.81
b2	1.15	1.77	1.24
c	0.356	0.61	-
D	14.22	16.51	-
D1	8.39	9.01	-
D2	11.45	12.87	-
e	-	-	2.54
e1	-	-	5.08
E	9.66	10.66	-
E1	6.86	8.89	-
H1	5.85	6.85	-
L	12.70	14.73	-
L1	-	4.42	-
L2	15.80	17.51	16.00
P	3.54	4.08	-
Q	2.54	3.42	-
All Dimensions in mm			

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