

## Product Summary

$BV_{DSS} (@ T_J \text{ Max})$	$R_{DS(ON)}$	$I_D$ $T_C = +25^\circ\text{C}$
650V	$2.5\Omega @ V_{GS} = 10V$	4.5A

## Description

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

## Applications

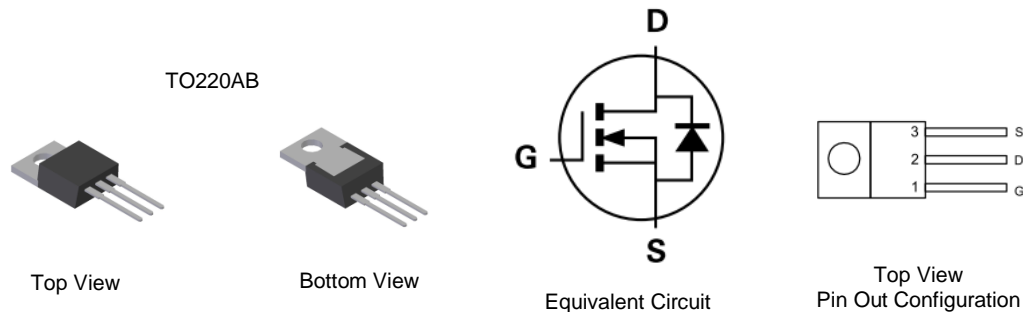
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

## Features

- 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<sup>(3)</sup>
- Terminal Connections: See Diagram Below
- Weight: TO220AB – 1.85 grams (Approximate)

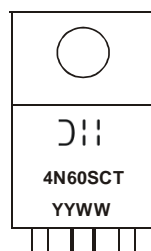


## Ordering Information (Note 4)

Part Number	Case	Packaging
DMG4N60SCT	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](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 <http://www.diodes.com/products/packages.html>.

## Marking Information



D11 = Manufacturer's Marking  
 4N60SCT = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or YY = Last Two Digits of Year (ex: 16 = 2016)  
 WW or WW = Week Code (01 to 53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	600	V
Gate-Source Voltage	V <sub>GSS</sub>	±30	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	I <sub>D</sub>	4.5 3	A
Maximum Body Diode Forward Current (Note 5)	I <sub>S</sub>	6	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I <sub>DM</sub>	6	A
Avalanche Current, L = 60mH (Note 6)	I <sub>AS</sub>	1.7	A
Avalanche Energy, L = 60mH (Note 6)	E <sub>AS</sub>	90	mJ

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	113 45	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	58	°C/W
Thermal Resistance, Junction to Case (Note 5)	R <sub>θJC</sub>	1.1	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	600	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	µA	V <sub>DS</sub> = 600V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	100	nA	V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	2.5	—	4.5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	2.0	2.5	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 2A
Diode Forward Voltage	V <sub>SD</sub>	—	—	1.4	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 6)</b>						
Input Capacitance	C <sub>iss</sub>	—	532	—	pF	V <sub>DS</sub> = 25V, f = 1.0MHz, V <sub>GS</sub> = 0
Output Capacitance	C <sub>oss</sub>	—	47	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	4	—		
Gate Resistance	R <sub>G</sub>	—	3.3	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	14.3	—	nC	V <sub>DD</sub> = 480V, I <sub>D</sub> = 4A, V <sub>GS</sub> = 10V
Gate-Source Charge	Q <sub>gs</sub>	—	3.3	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	6.9	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	14	—	ns	V <sub>DD</sub> = 300V, R <sub>G</sub> = 25Ω, I <sub>D</sub> = 4A, V <sub>GS</sub> = 10V
Turn-On Rise Time	t <sub>R</sub>	—	34	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	32	—		
Turn-Off Fall Time	t <sub>F</sub>	—	25	—	ns	dI/dt = 100A/µs, V <sub>DS</sub> = 100V, I <sub>F</sub> = 4A
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	229	—		
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	1564	—	nC	

Notes:

- Device mounted on an infinite heatsink.
- Guaranteed by design. Not subject to production testing.
- Short duration pulse test used to minimize self-heating effect.

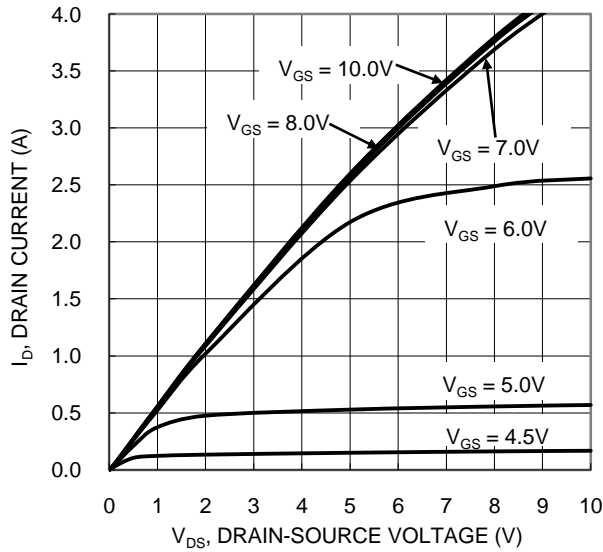


Figure 1. Typical Output Characteristic

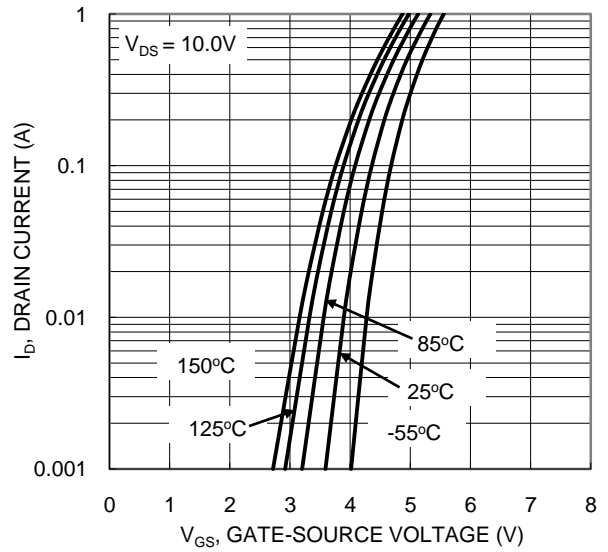


Figure 2. Typical Transfer Characteristic

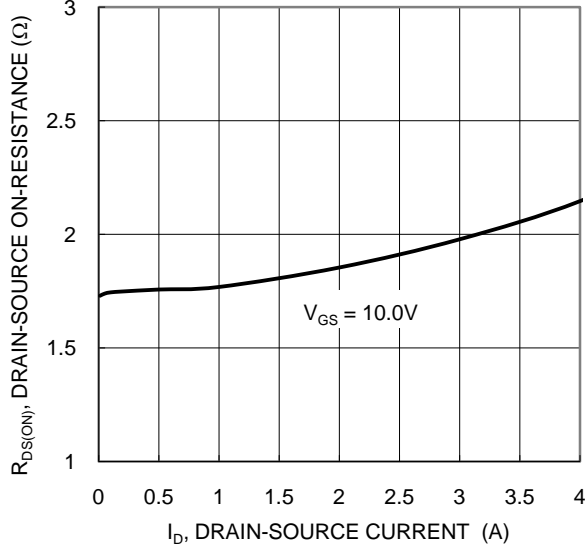


Figure 3. Typical On-Resistance vs Drain Current and Gate Voltage

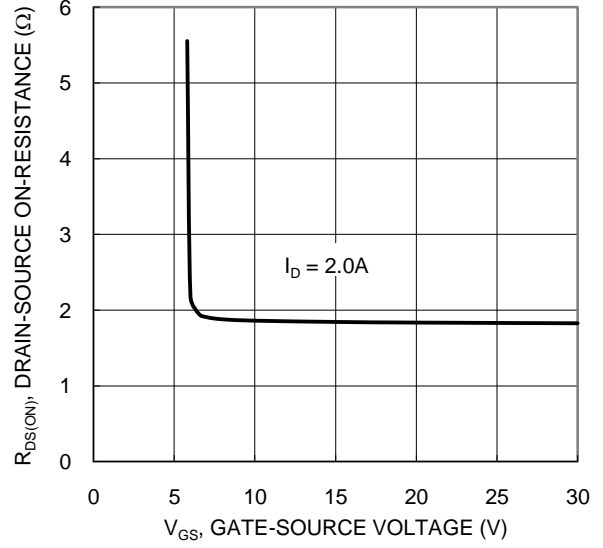


Figure 4. Typical Transfer Characteristic

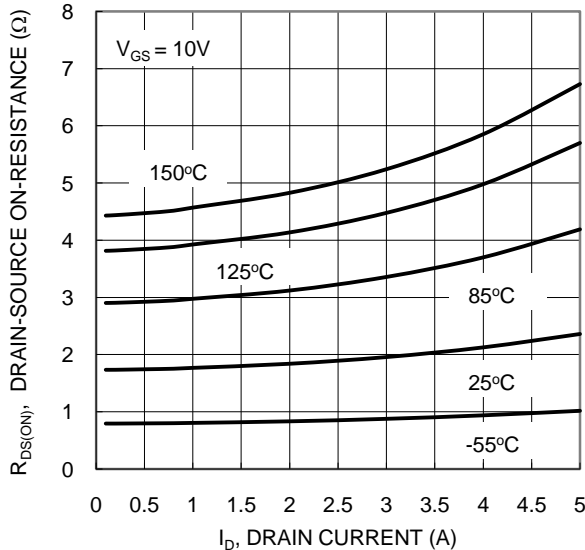


Figure 5. Typical On-Resistance vs Drain Current and Temperature

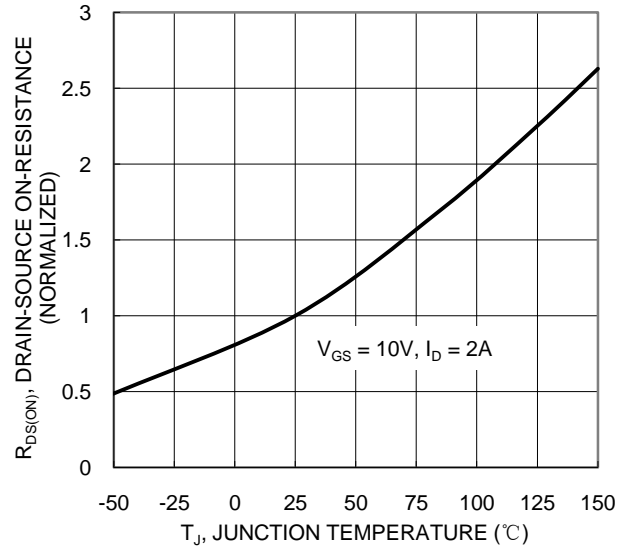


Figure 6. On-Resistance Variation with Temperature

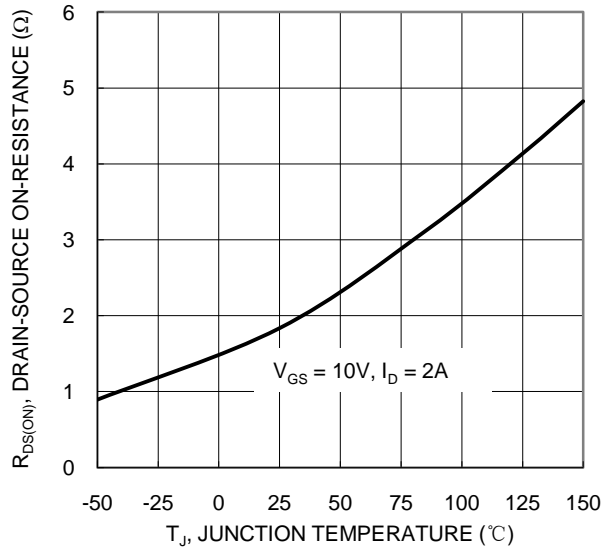


Figure 7. On-Resistance Variation with Temperature

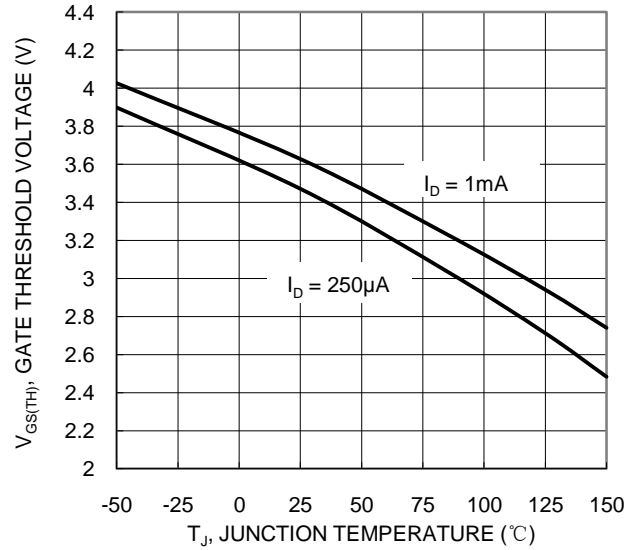


Figure 8. Gate Threshold Variation vs Junction Temperature

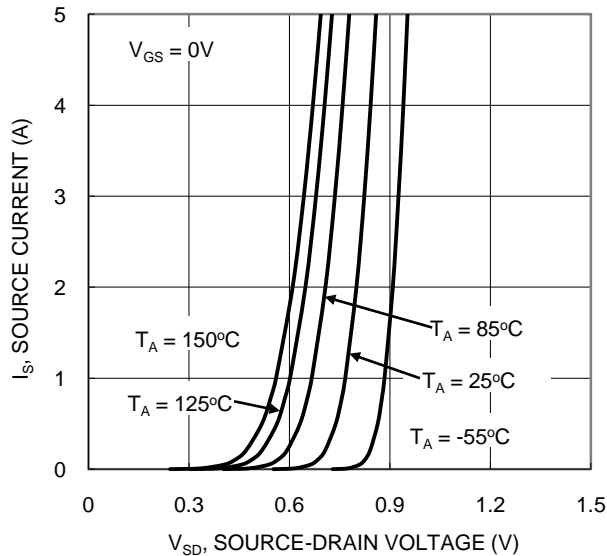


Figure 9. Diode Forward Voltage vs Current

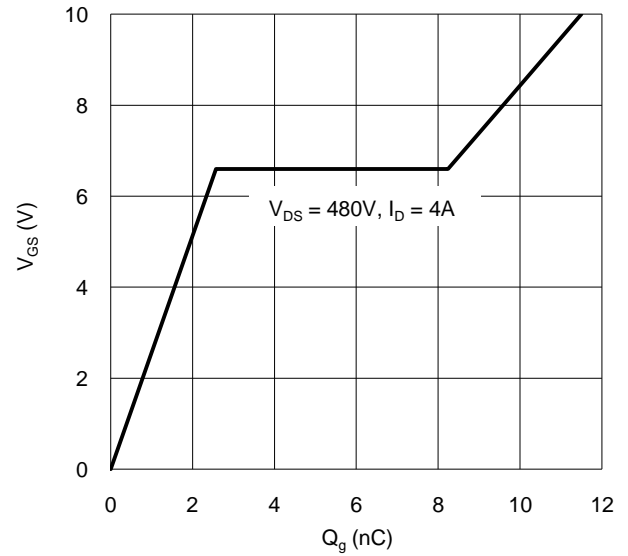


Figure 10. Gate Charge

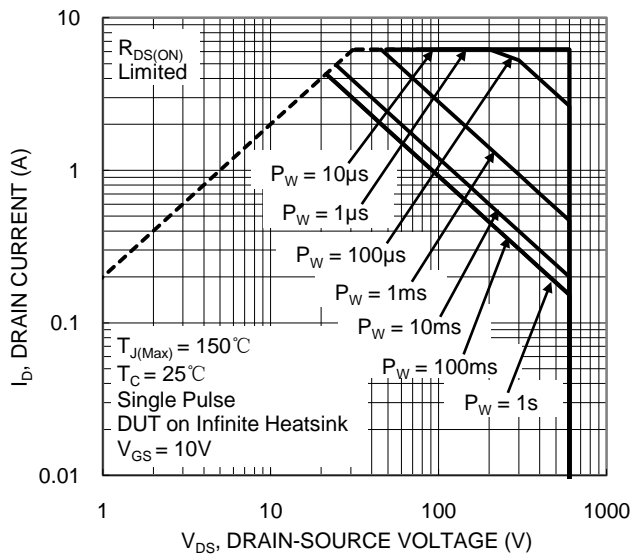
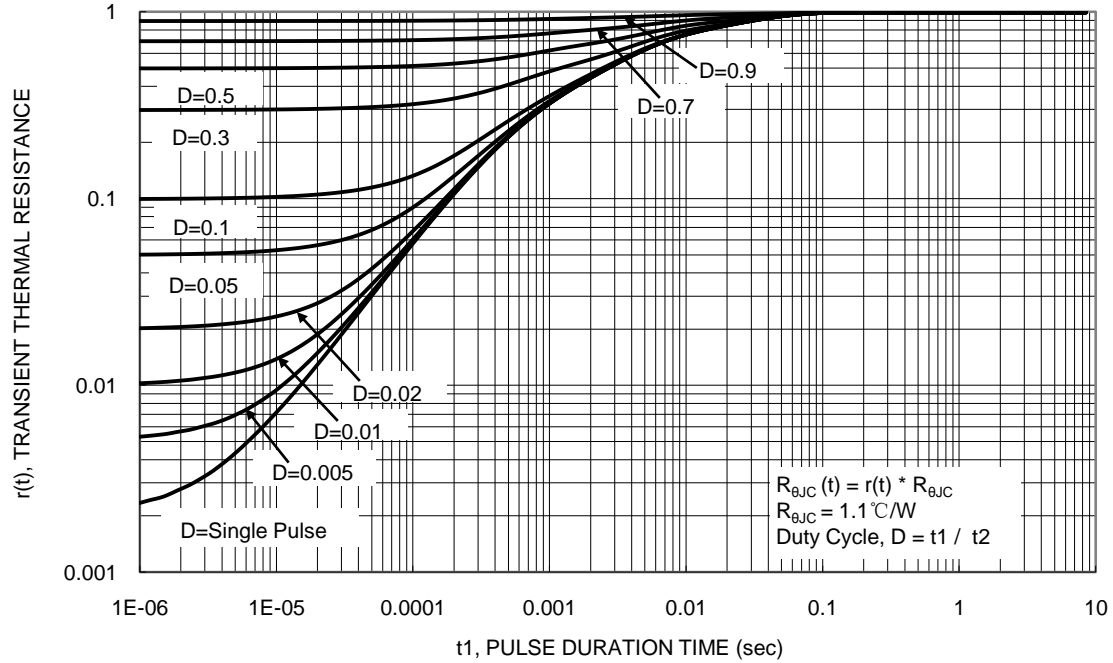


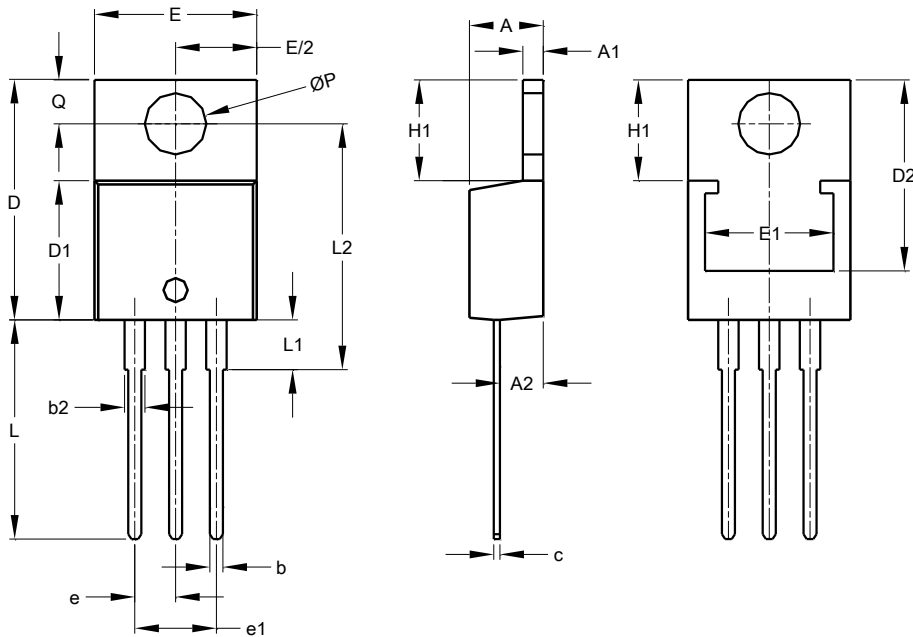
Figure 11. SOA, Safe Operation Area



## 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	-	6.35	-
L2	15.80	16.20	16.00
P	3.54	4.08	-
Q	2.54	3.42	-
All Dimensions in mm			

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