

Product Summary

BV _{DSS}	R _{DS(ON)}	Package	I _D T _C = +25°C
650V	1.4Ω@V _{GS} = 10V	TO220AB (Type TH)	7.7A

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

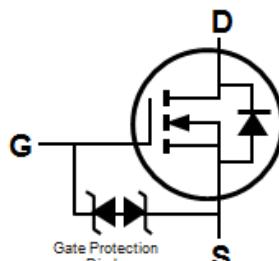
TO220AB (Type TH)



Top View



Bottom View



Equivalent Circuit



Top View
Pin Out Configuration

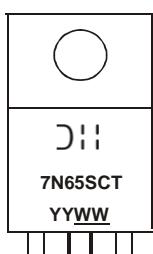
Ordering Information (Note 4)

Part Number	Case	Packaging
DMG7N65SCT	TO220AB (Type TH)	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 <http://www.diodes.com/products/packages.html>.

Marking Information



DII = Manufacturer's Marking

7N65SCT = 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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	650	V
Gate-Source Voltage			V_{GSS}	± 30	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	Steady State	$T_C = +25^\circ\text{C}$ $T_C = +100^\circ\text{C}$	I_D	7.7 4.8	A
Maximum Body Diode Forward Current (Note 5)			I_S	10	A
Pulsed Drain Current (10 μs pulse, duty cycle = 1%)			I_{DM}	10	A
Avalanche Current, $L = 60\text{mH}$ (Note 6)			I_{AS}	1.1	A
Avalanche Energy, $L = 60\text{mH}$ (Note 6)			E_{AS}	42	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	$T_C = +25^\circ\text{C}$	P_D	125	W
	$T_C = +100^\circ\text{C}$		50	
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	50	°C/W
Thermal Resistance, Junction to Case (Note 5)		$R_{\theta JC}$	1	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	650	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 650\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	10	μA	$V_{GS} = \pm 24\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(\text{TH})}$	2	—	4	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	1.1	1.4	Ω	$V_{GS} = 10\text{V}, I_D = 2.5\text{A}$
Diode Forward Voltage	V_{SD}	—	0.8	1.5	V	$V_{GS} = 0\text{V}, I_S = 5\text{A}$
DYNAMIC CHARACTERISTICS (Note 6)						
Input Capacitance	C_{iss}	—	886	—	pF	$V_{DS} = 50\text{V}, f = 1.0\text{MHz}, V_{GS} = 0$
Output Capacitance	C_{oss}	—	63	—		
Reverse Transfer Capacitance	C_{rss}	—	8.9	—		
Gate Resistance	R_G	—	1.4	—	nC	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$ $V_{DS} = 480\text{V}, I_D = 5\text{A}, V_{GS} = 10\text{V}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	—	25.2	—		
Gate-Source Charge	Q_{gs}	—	3.5	—		
Gate-Drain Charge	Q_{gd}	—	12.4	—	ns	$V_{DS} = 300\text{V}, R_G = 4.7\Omega, I_D = 2.5\text{A}, V_{GS} = 10\text{V}$
Turn-On Delay Time	$t_{D(\text{ON})}$	—	10	—		
Turn-On Rise Time	t_R	—	11	—		
Turn-Off Delay Time	$t_{D(\text{OFF})}$	—	36	—		
Turn-Off Fall Time	t_F	—	15	—	μC	$V_{DS} = 60\text{V}, I_F = 5\text{A}, dI/dt = 100\text{A}/\mu\text{s}$
Body Diode Reverse Recovery Time	t_{RR}	—	271	—		
Body Diode Reverse Recovery Charge	Q_{RR}	—	1908	—		

Notes:

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

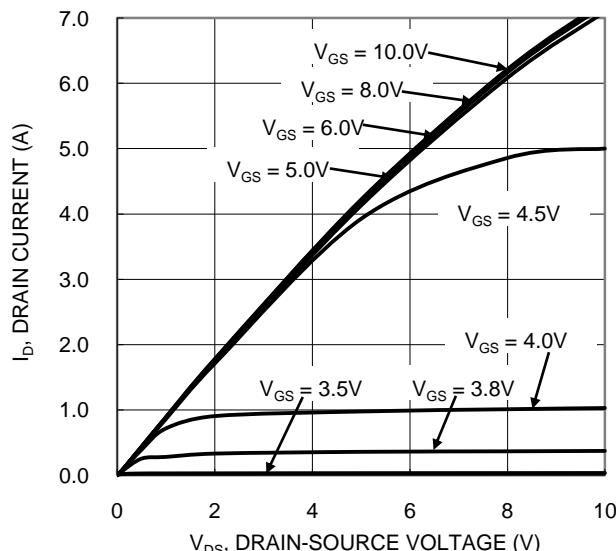


Figure 1. Typical Output Characteristic

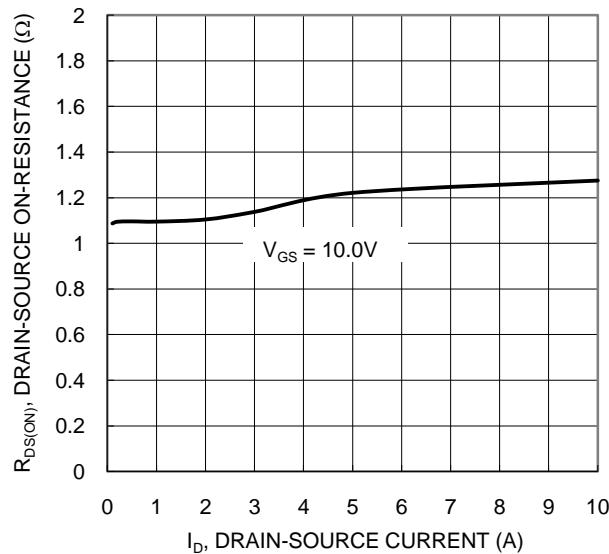


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

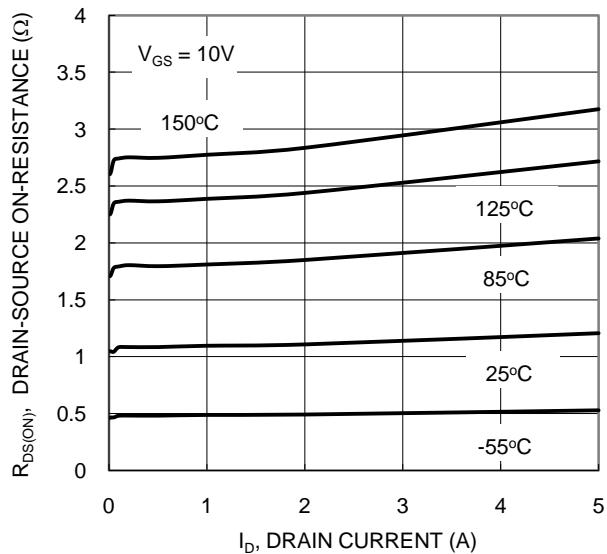


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

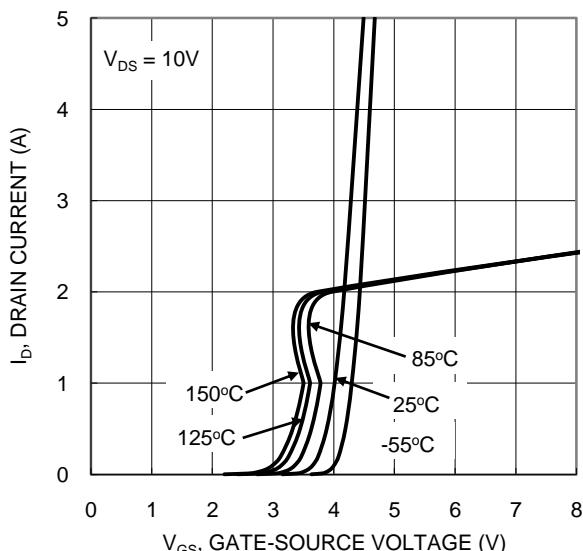


Figure 2. Typical Transfer Characteristic

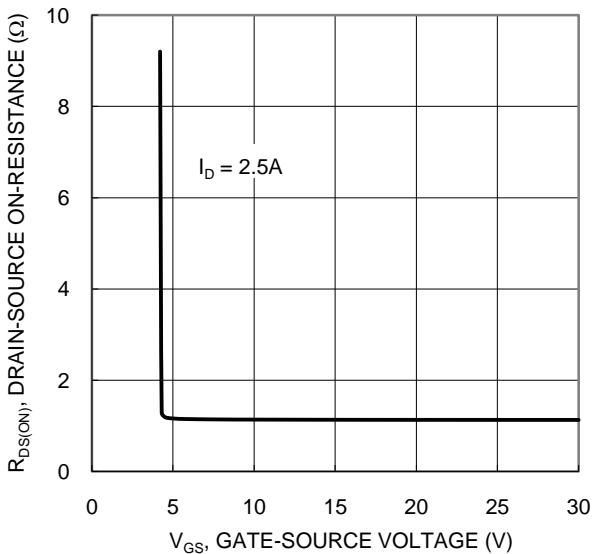


Figure 4. Typical Transfer Characteristic

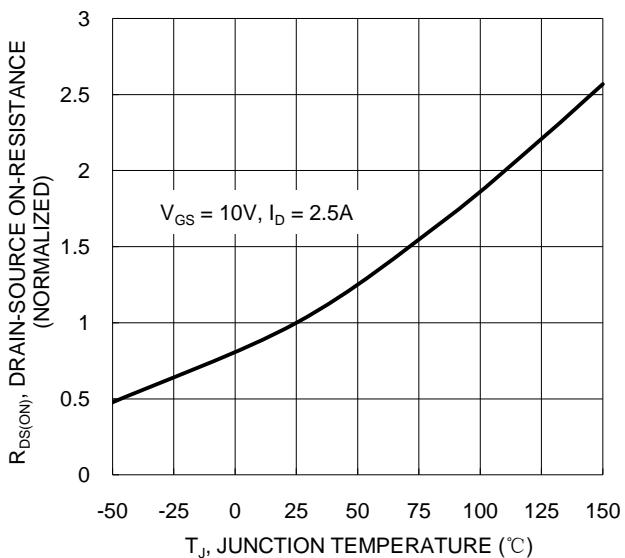


Figure 6. On-Resistance Variation with Junction Temperature

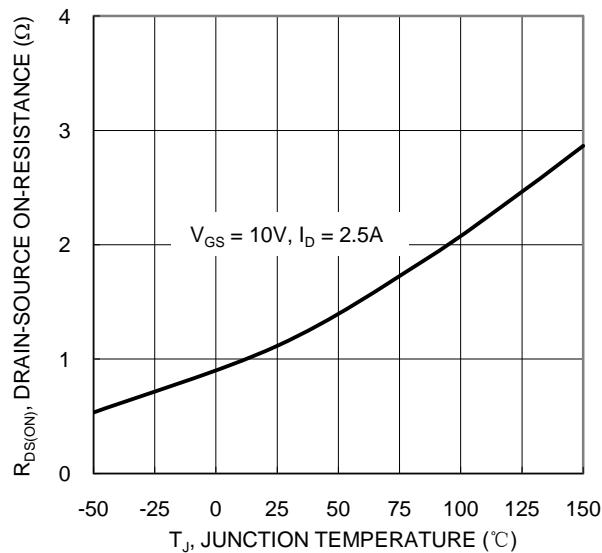


Figure 7. On-Resistance Variation with Junction Temperature

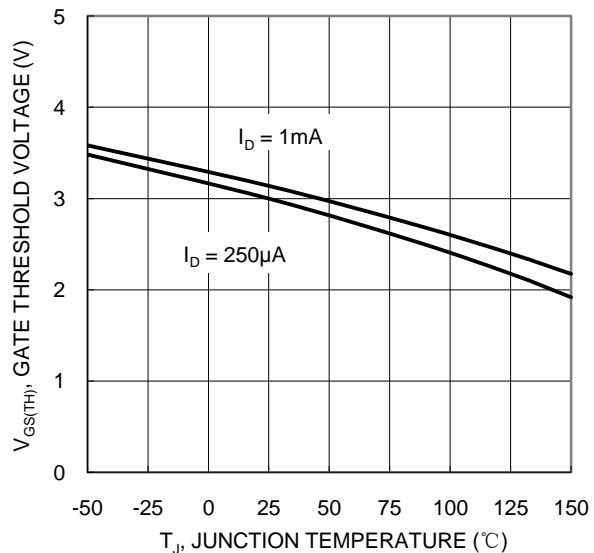


Figure 8. Gate Threshold Variation vs. Junction Temperature

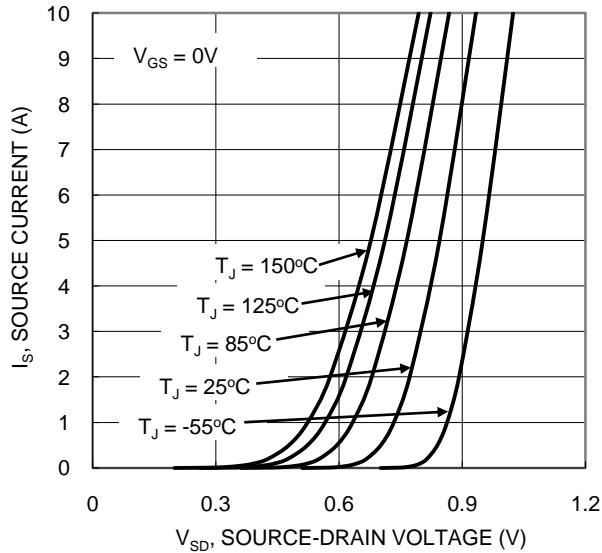


Figure 9. Diode Forward Voltage vs. Current

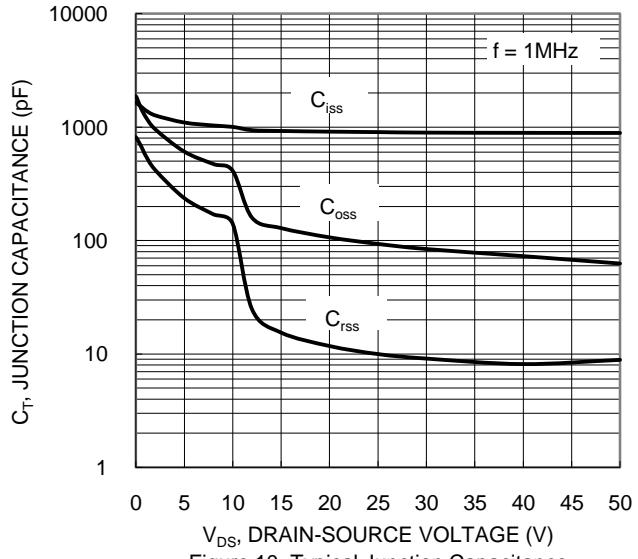


Figure 10. Typical Junction Capacitance

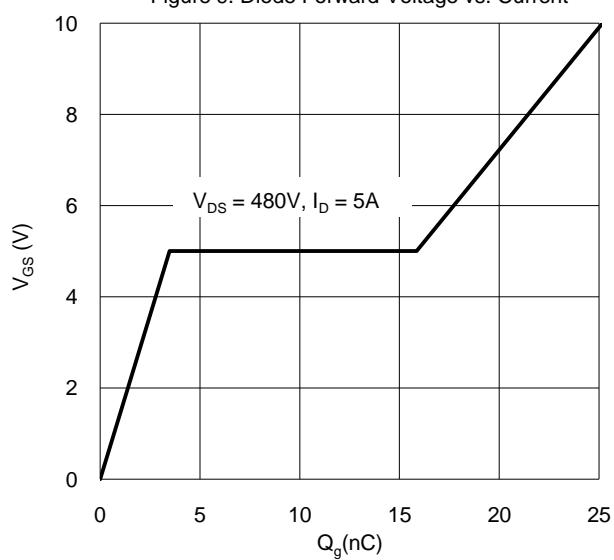


Figure 11. Gate Charge

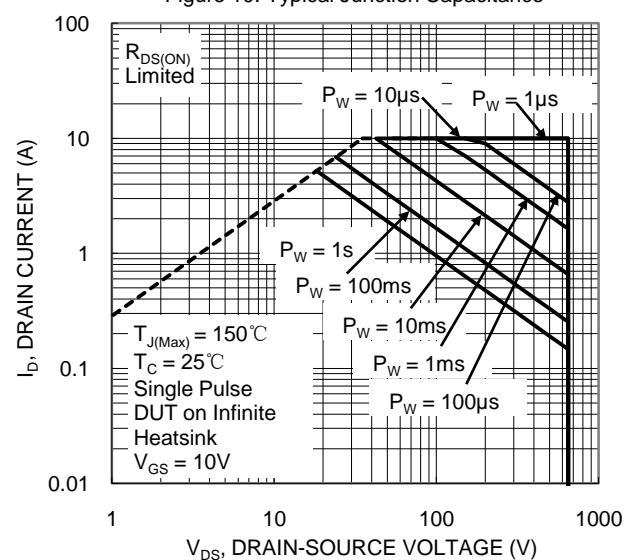


Figure 12. SOA, Safe Operation Area

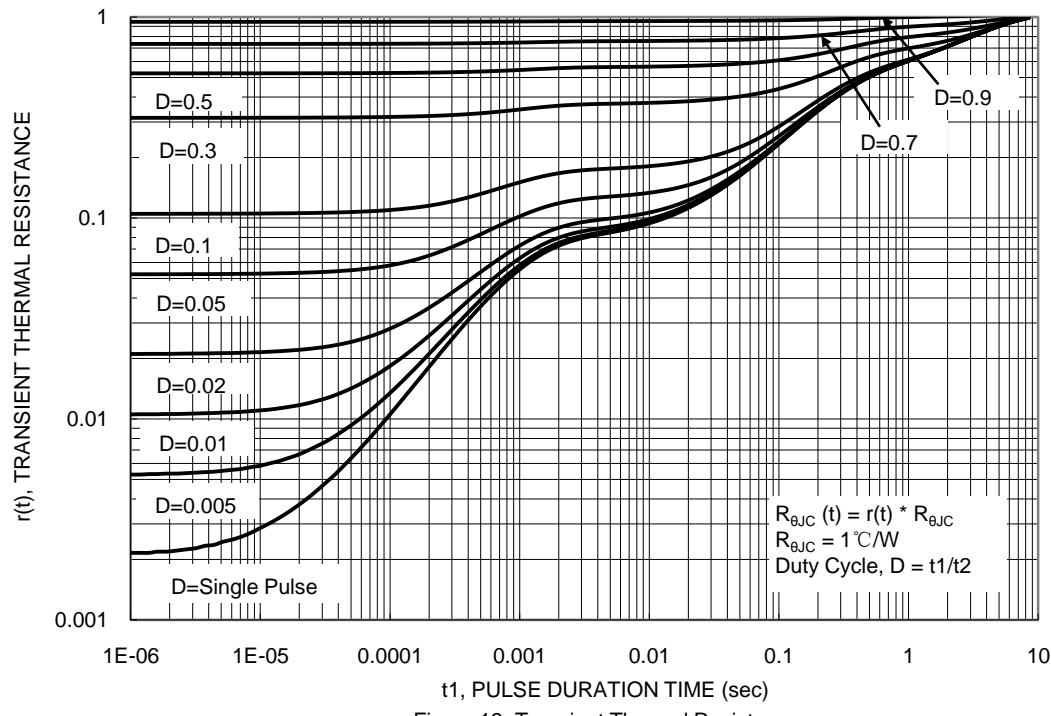
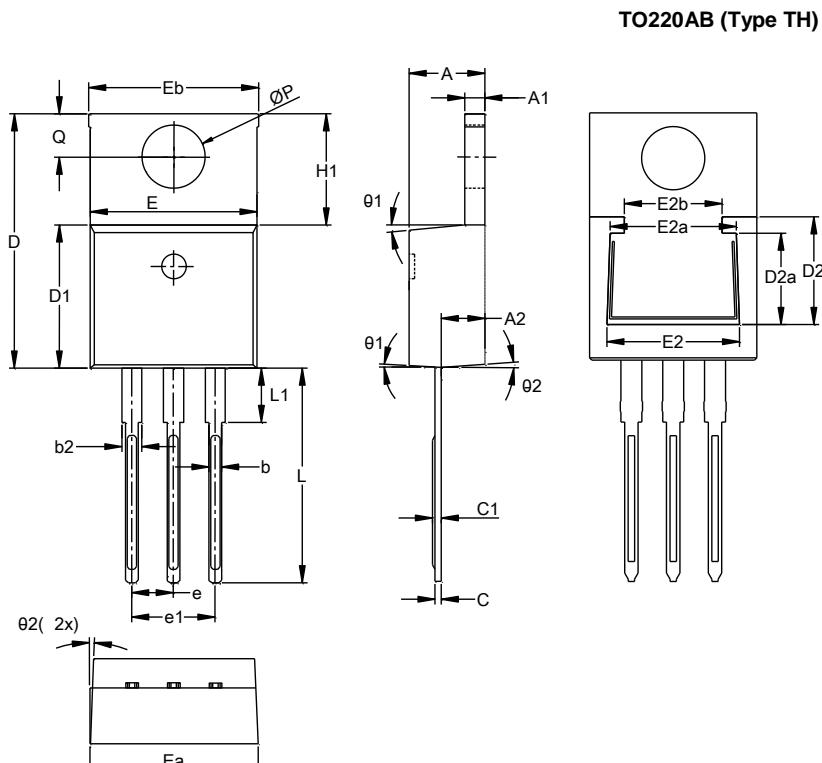


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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



TO220AB (Type TH)

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Dim	Min	Max	Typ
A	4.27	4.87	4.57
A1	1.12	1.42	1.27
A2	2.39	2.99	2.69
b	0.70	1.01	0.81
b2	1.17	1.50	1.27
c	0.30	0.53	0.38
c1	0.38	0.72	0.56
D	14.60	15.40	15.00
D1	8.40	9.00	8.70
D2	5.33	6.63	6.33
D2a	4.54	5.84	5.54
e	2.54 BSC		
e1	5.08 BSC		
E	9.88	10.50	10.16
Ea	9.90	10.45	10.10
Eb	9.90	10.65	10.25
E2	7.06	8.36	8.06
E2a	6.67	7.97	7.67
E2b	4.94	6.24	5.94
H1	5.70	6.65	6.30
L	13.00	13.80	13.40
L1	-	4.10	3.75
Q	2.50	2.99	2.74
ØP	3.70	3.99	3.84
θ1	4°	10°	7°
θ2	0°	6°	3°

All Dimensions in mm

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