

Product Summary

BV_{DSS}	$R_{DS(on) \max}$	I_D $T_C = +25^\circ C$
700V	1.3Ω @ $V_{GS} = 10V$	4.6A

Features and Benefits

- Low On-Resistance
- High BV_{DSS} rating for power application
- Low Input Capacitance
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

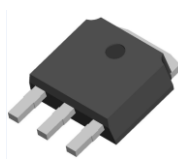
Description and Applications

This MOSFET is designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

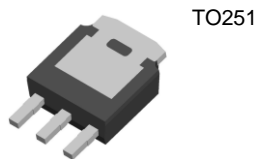
- Motor Control
- Backlighting
- AC-DC Converters

Mechanical Data

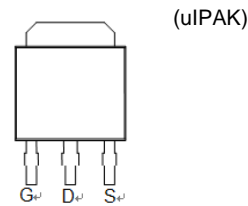
- Case: TO251
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 **(e3)**
- Weight: 0.33 grams (Approximate)



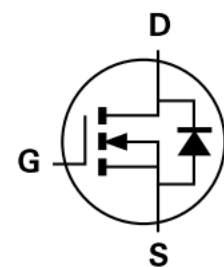
TO251
Top View



TO251
Bottom View



TO251
Top View
Pin Configuration



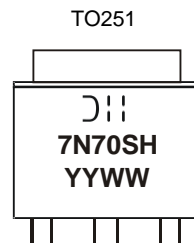
Internal Schematic

Ordering Information (Note 4)

Part Number	Case	Packaging
DMJ70H1D3SH3	TO251	75pieces / 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



= Manufacturer's Marking
 7N70SH = Product Type Marking Code
 YYWW = Date Code Marking
 YY or YY = Last Digit of Year (ex: 15 = 2015)
 WW or WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V _{DSS}	700	V
Gate-Source Voltage	V _{GSS}	±30	V
Continuous Drain Current (Note 5) V _{GS} = 10V	I _D	T _C = +25°C	4.6
		T _C = +100°C	2.9
Maximum Body Diode Forward Current (Note 6)	I _S	3.0	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I _{DM}	5.4	A
Avalanche Current (Note 7)	I _{AS}	1.1	A
Avalanche Energy (Note 7)	E _{AS}	40	mJ
Peak Diode Recovery dv/dt (Note 7)	dv/dt	5	V/ns

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

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P _D	T _C = +25°C	41
		T _C = +100°C	16
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	79	°C/W
Thermal Resistance, Junction to Case (Note 5)	R _{θJC}	3.0	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	700	—	—	V	V _{GS} = 0V, I _D = 250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 700V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±30V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(th)}	2	2.9	4	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	1.0	1.3	Ω	V _{GS} = 10V, I _D = 2.5A
Diode Forward Voltage	V _{SD}	—	0.9	1.3	V	V _{GS} = 0V, I _S = 5A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iSS}	—	351	—	pF	V _{DS} = 50V, f = 1MHz, V _{GS} = 0V
Output Capacitance	C _{oss}	—	66	—		
Reverse Transfer Capacitance	C _{rSS}	—	1.1	—		
Gate Resistance	R _G	—	3.5	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _g	—	13.9	—	nC	V _{DD} = 560V, I _D = 5A, V _{GS} = 10V
Gate-Source Charge	Q _{gs}	—	1.9	—		
Gate-Drain Charge	Q _{gd}	—	8.5	—		
Turn-On Delay Time	t _{D(on)}	—	8.5	—	ns	V _{DD} = 350V, V _{GS} = 10V, R _G = 4.7Ω, I _D = 2.5A
Turn-On Rise Time	t _r	—	11.6	—		
Turn-Off Delay Time	t _{D(off)}	—	24.5	—		
Turn-Off Fall Time	t _f	—	10	—		
Body Diode Reverse Recovery Time	t _{rr}	—	212	—	ns	I _S = 5A, di/dt = 100A/µs
Body Diode Reverse Recovery Time (T _J = +150°C)	t _{rr}	—	251	—	ns	
Body Diode Reverse Recovery Charge	Q _{rr}	—	1.8	—	µC	
Body Diode Reverse Recovery Charge (T _J = +150°C)	Q _{rr}	—	2.3	—	µC	

- Notes:
- Device mounted on infinite heatsink.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Guaranteed by design. Not subject to production testing.
 - Short duration pulse test used to minimize self-heating effect.

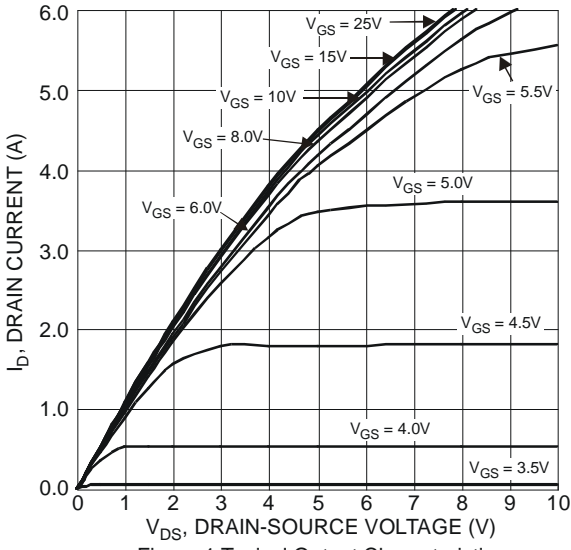


Figure 1 Typical Output Characteristics

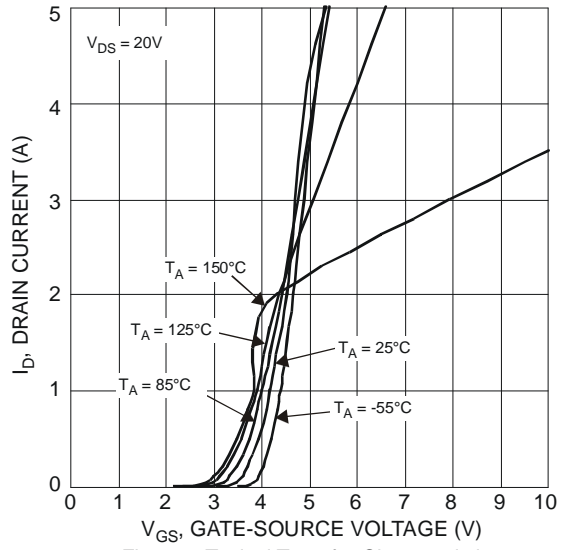


Figure 2 Typical Transfer Characteristics

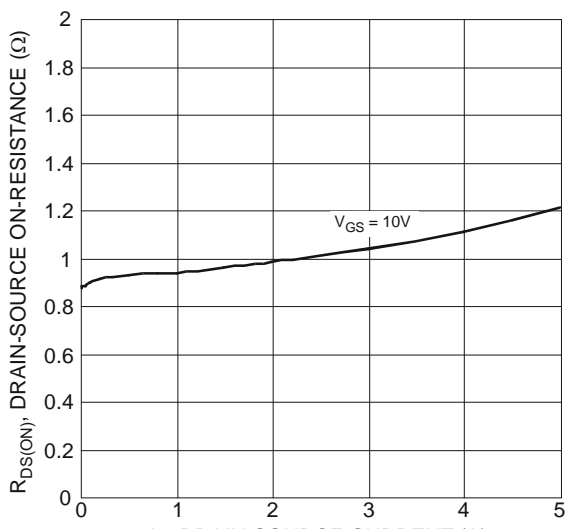


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

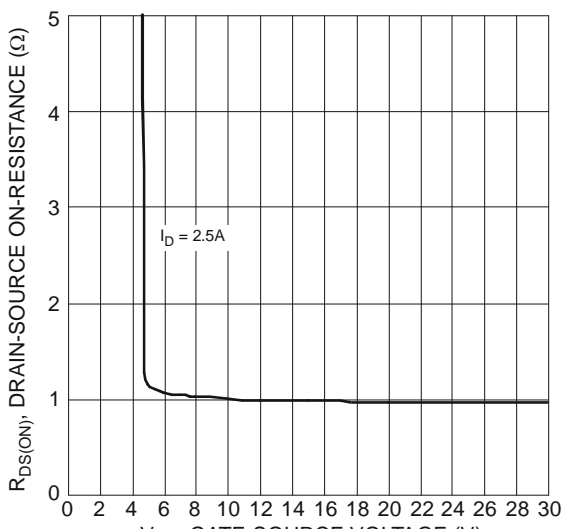


Figure 4 Typical Transfer Characteristics

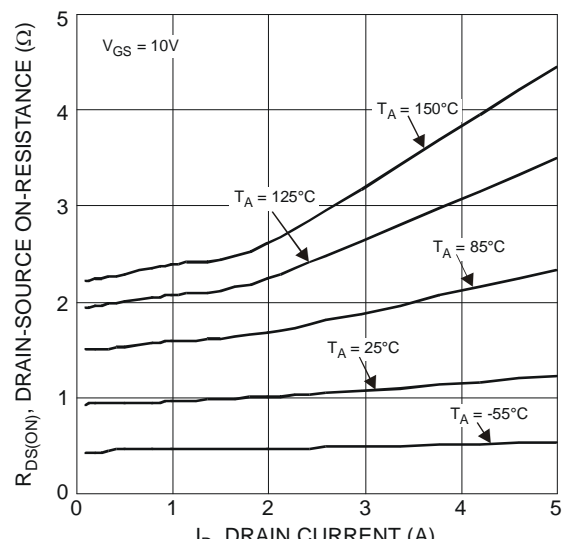


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

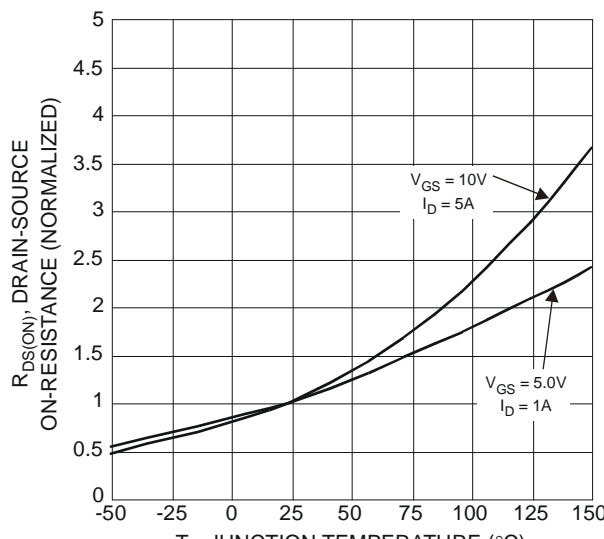


Figure 6 On-Resistance Variation with Temperature

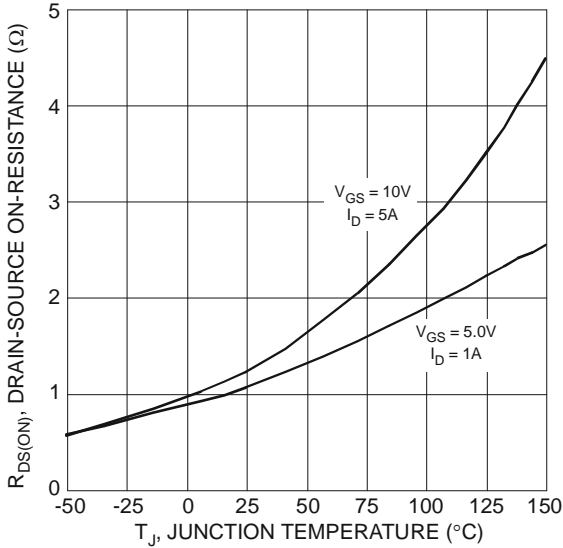


Figure 7 On-Resistance Variation with Temperature

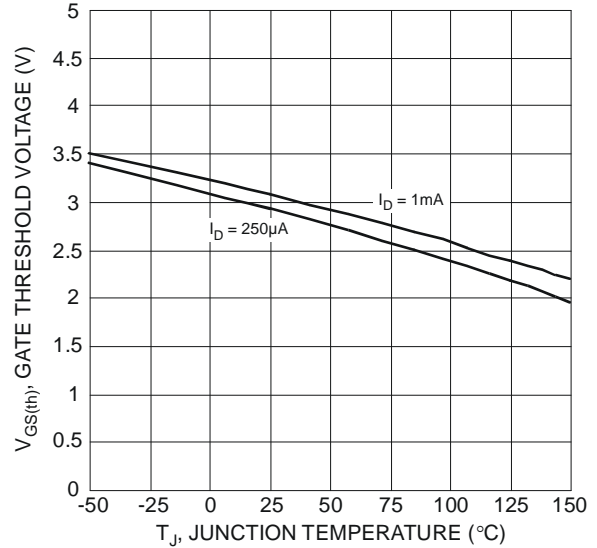


Figure 8 Gate Threshold Variation vs. Ambient Temperature

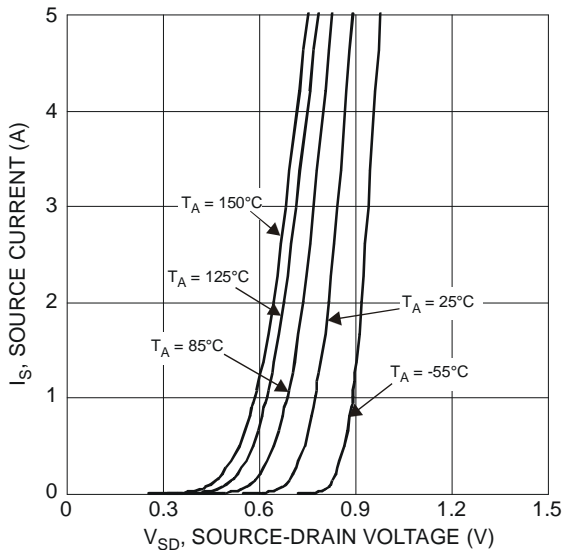


Figure 9 Diode Forward Voltage vs. Current

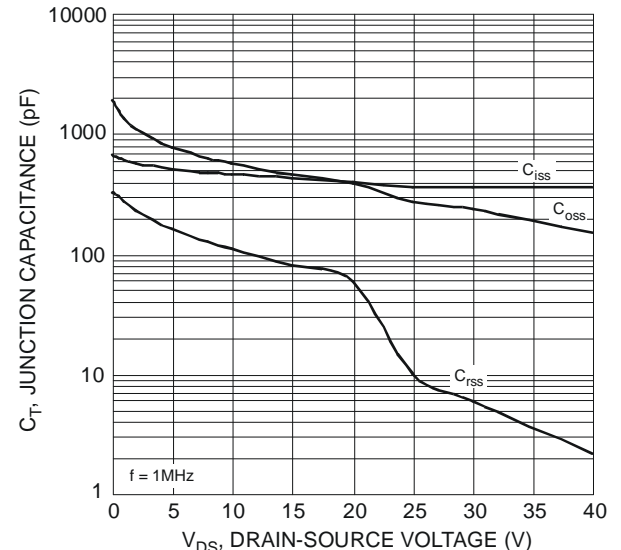


Figure 10 Typical Junction Capacitance

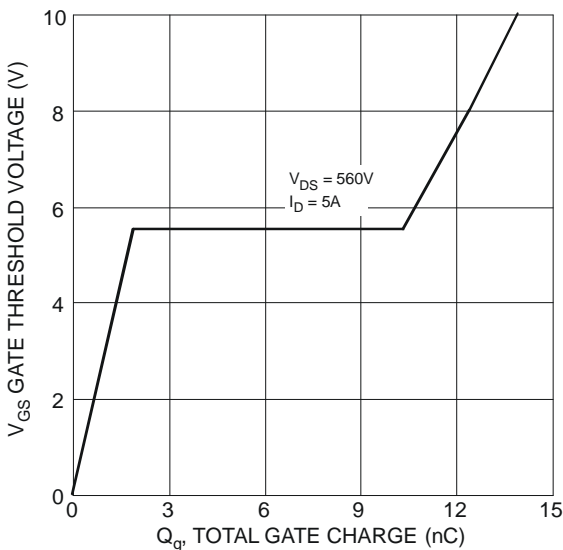


Figure 11 Gate Charge

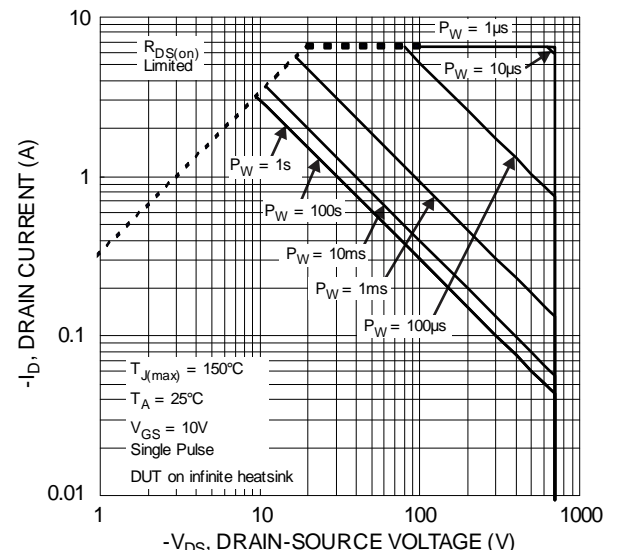
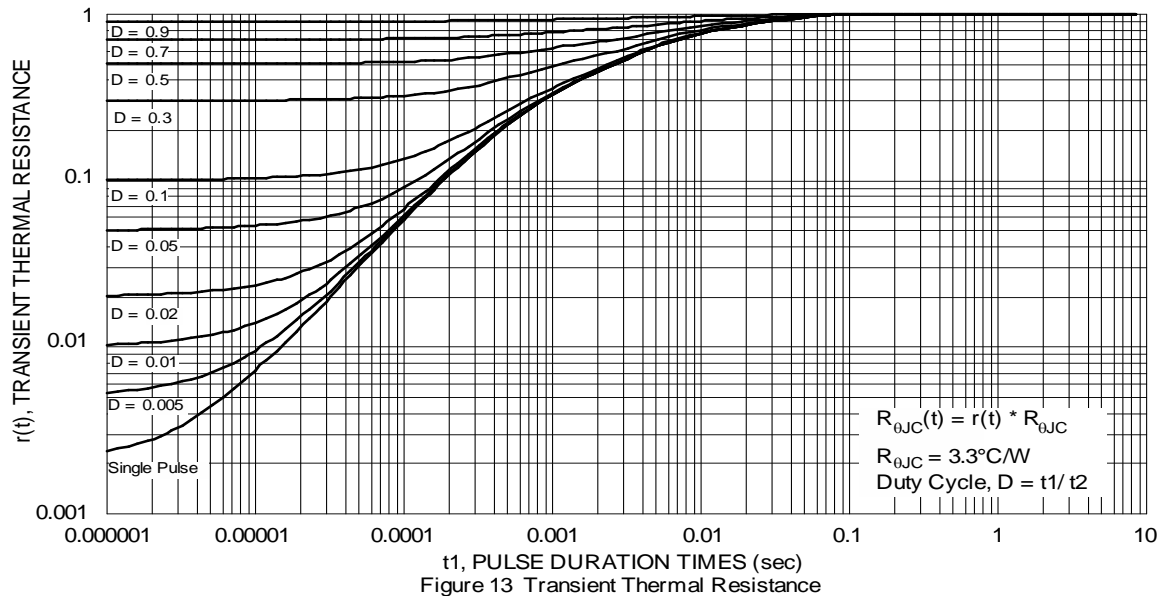
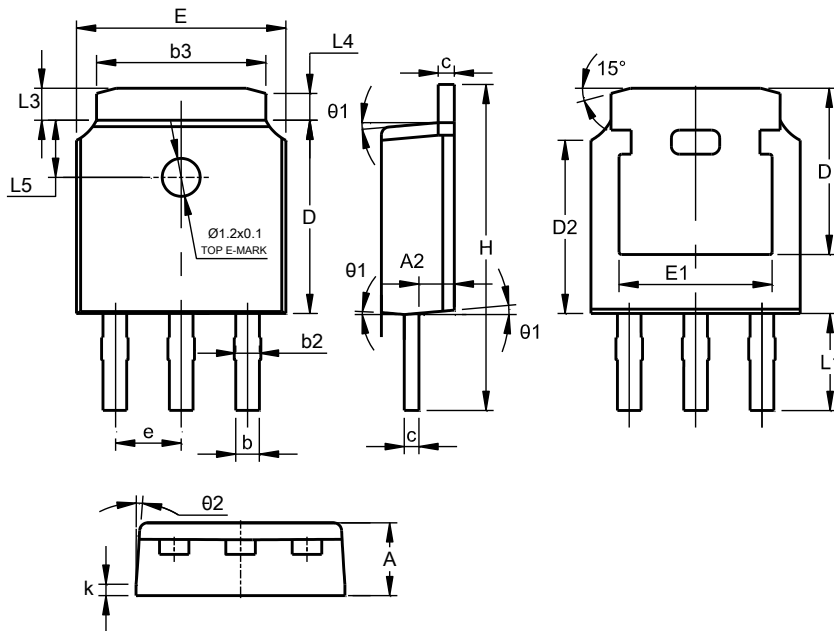


Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



TO251 (Type TH3)			
Dim	Min	Max	Typ
A	2.20	2.40	2.30
A2	0.97	1.17	1.07
b	0.68	0.90	0.78
b2	0.76	0.95	0.84
b3	5.20	5.50	5.33
c	0.43	0.63	0.53
D	5.98	6.22	6.10
D1	5.30 REF		
D2	5.26	5.66	5.46
e	2.286 BSC		
E	6.40	6.80	6.60
E1	4.63	5.03	4.83
H	9.40	9.85	9.62
k	0.40REF		
L1	2.30	2.70	2.50
L3	0.88	1.28	1.02
L4	0.75 REF		
L5	1.65	1.95	1.80
theta1	5°	9°	7°
theta2	5°	9°	7°
All Dimensions in mm			

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