Prisemi®

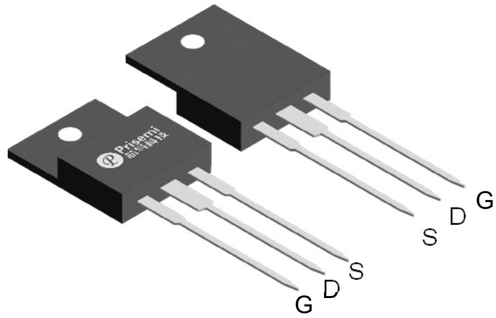
PSJMTOF65R180

N-Channel MOSFET

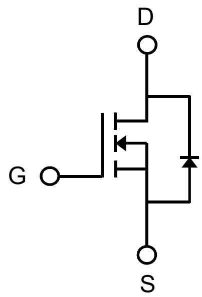
Description

The PSJMTOF65R180 is a high voltage MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics. This power MOSFET is usually used at high speed switching applications in power supplies, PWM motor controls, high efficient DC to DC converters and bridge circuits.

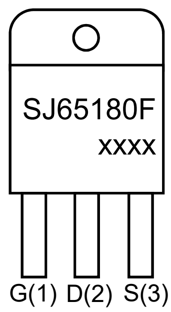
MOSFET Product Summary		
V_{DS}(V)	$R_{DS(on)}$(mΩ)(Typ)	I_D(A)
650	140@ V_{GS} = 10V	19



TO-220F



Circuit Diagram



Marking (Top View)

Feature

- Fast Switching Capability
- Lead free product is acquired.
- Avalanche Energy Tested

Applications

- PWM applications
- Load Switch
- Power Management
- DC-DC Converters

Absolute maximum rating@25℃

Rating		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	V
Drain Current-Continuous[1)]	T_C=25℃	I_D	19	A
	T_C=100℃		12	
Pulsed Drain Current[2)]		I_{DM}	55	A
Total Power Dissipation[3)]		P_D	171	W
Avalanche Current[4)]		I_{AS}	3.7	A
Avalanche Energy[4)]		E_{AS}	142	mJ
Thermal Resistance , Junction-to-Case[6)]		$R_{\theta JC}$	0.7	℃/W
Thermal Resistance , Junction-to-Ambient[5)]		$R_{\theta JA}$	49.7	℃/W
Junction and Storage Temperature Range		$T_{J,}T_{STG}$	-55~+150	℃

Electrical characteristics per line@25℃ (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V,I_D = 250μA	650	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 600V,V_{GS} = 0V	-	-	1.0	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±30V,V_{DS} = 0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS},I_D = 250μA	2.5	2.8	3.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS} = 10V,I_D = 1A	-	140	180	mΩ
Dynamic Characteristics[7)]						
Input Capacitance	C_{iss}	V_{DS} = 100V,V_{GS} = 0V, f = 1.0MHz	-	1508	-	pF
Output Capacitance	C_{oss}		-	56	-	
Reverse Transfer Capacitance	C_{rss}		-	1.2	-	
Switching Characteristics[7)]						
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = 400V, V_{GS} = 10V, I_D = 1A,R_G = 10Ω	-	16	-	ns
Turn-on Rise Time	t_r		-	10	-	
Turn-Off Delay Time	$t_{d(off)}$		-	149	-	
Turn-Off Fall Time	t_f		-	58	-	
Total Gate Charge	Q_g	V_{DS} = 480V, V_{GS} = 10V, I_D = 1A	-	32.7	-	nC
Gate-Source Charge	Q_{gs}		-	4.2	-	
Gate-Drain Charge	Q_{gd}		-	5.1	-	
Gate Resistance	R_g	f=1MHz , Open Drain	-	2.7	-	Ω
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V,I_S = 1A	-	0.7	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=1A, V_R=200V, dI_F/d_t=100A/μs	-	115	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	0.6	-	μC
Peak Reverse Recovery Current	I_{rrm}		-	10.7	-	A

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. Repetitive Rating: Pulse width limited by maximum junction temperature(T_{J_Max}=150℃).
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. This single-pulse measurement was taken under the following condition [L=20mH,V_{GS}=10V,V_{DS}=150V]while it's value is limited by T_{J_Max}=150℃.
5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
6. Device mounted on infinite heatsink.
7. Guaranteed by design, not subject to production.

Typical Characteristics

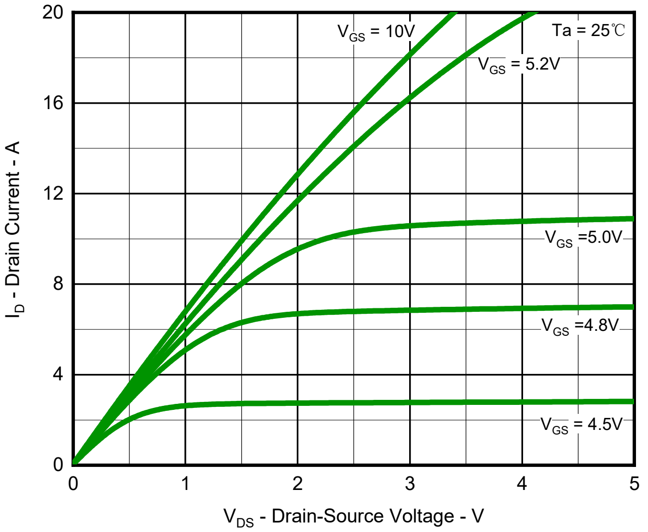


Fig.1 Output Characteristics

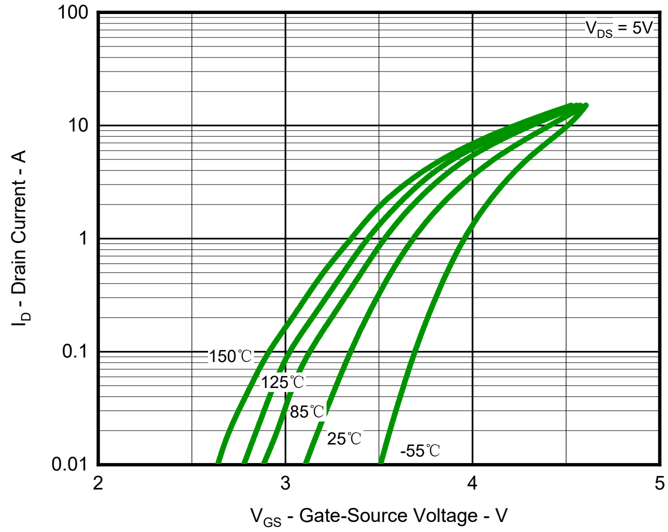


Fig.2 Typical Transfer Characteristic

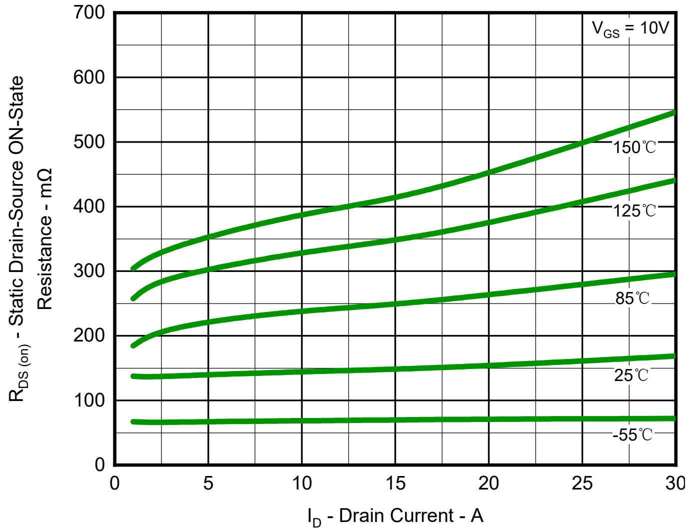


Fig.3 Typical On-Resistance vs Drain Current and Temperature

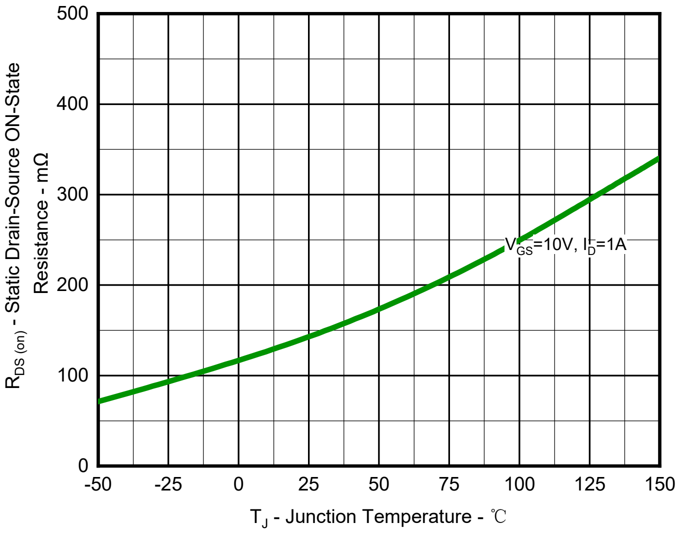


Fig.4 On-Resistance Variation with Temperature

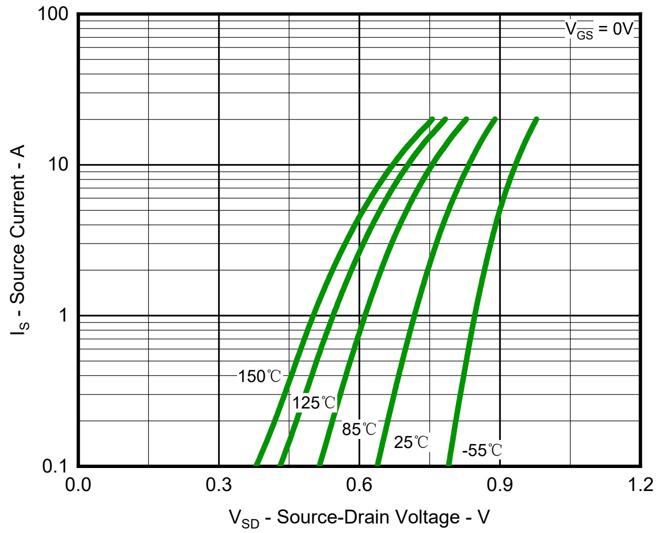


Fig.5 Diode Forward Voltage vs. Current

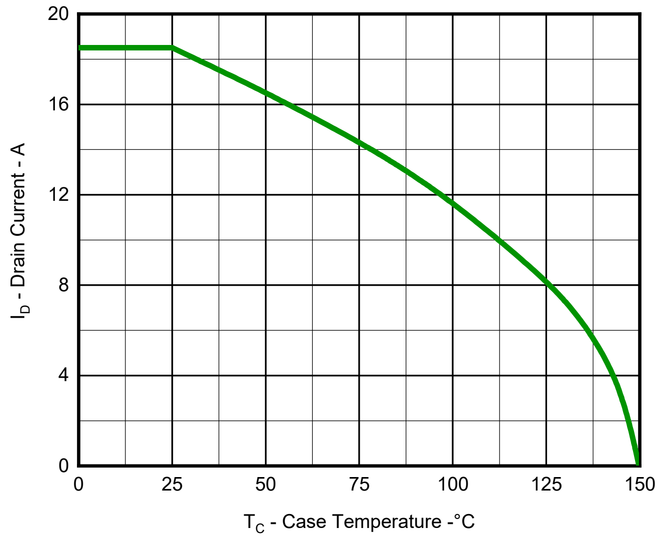


Fig.6 Maximum Drain Current vs. Case Temperature

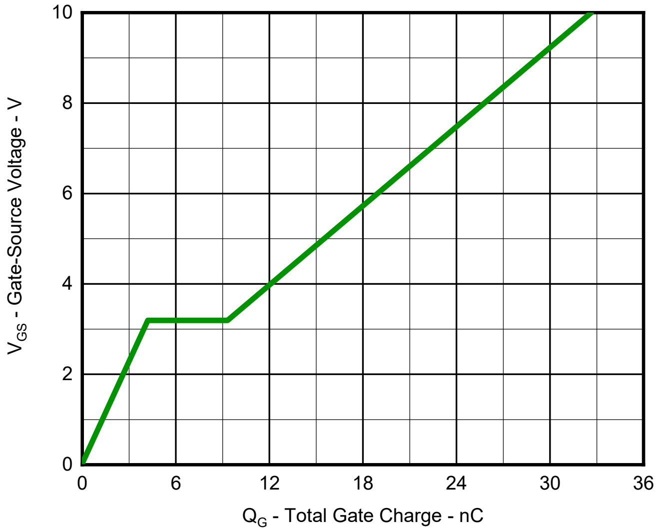


Fig.7 Gate Charge Characteristics

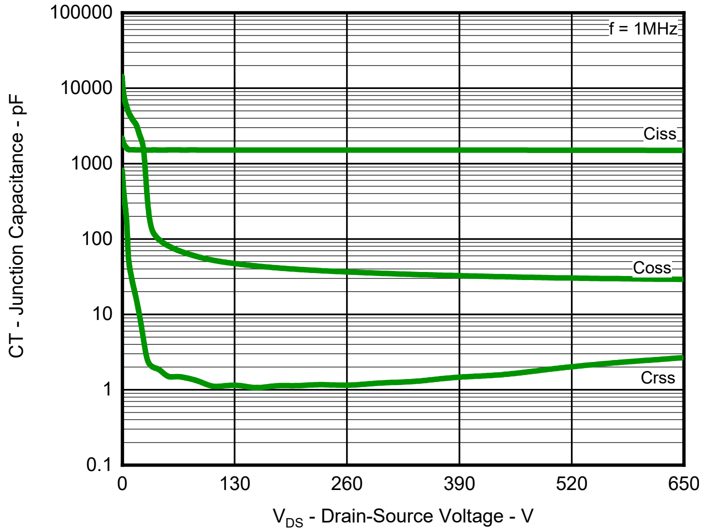


Fig.8 Typical Junction Capacitance

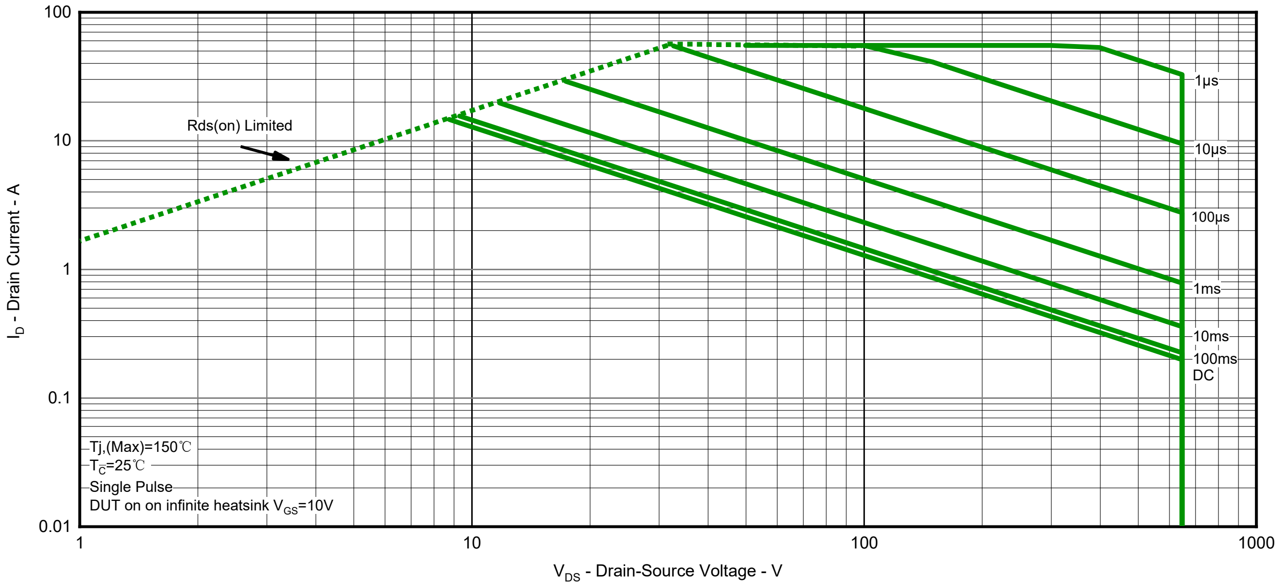


Fig.9 Safe Operation Area

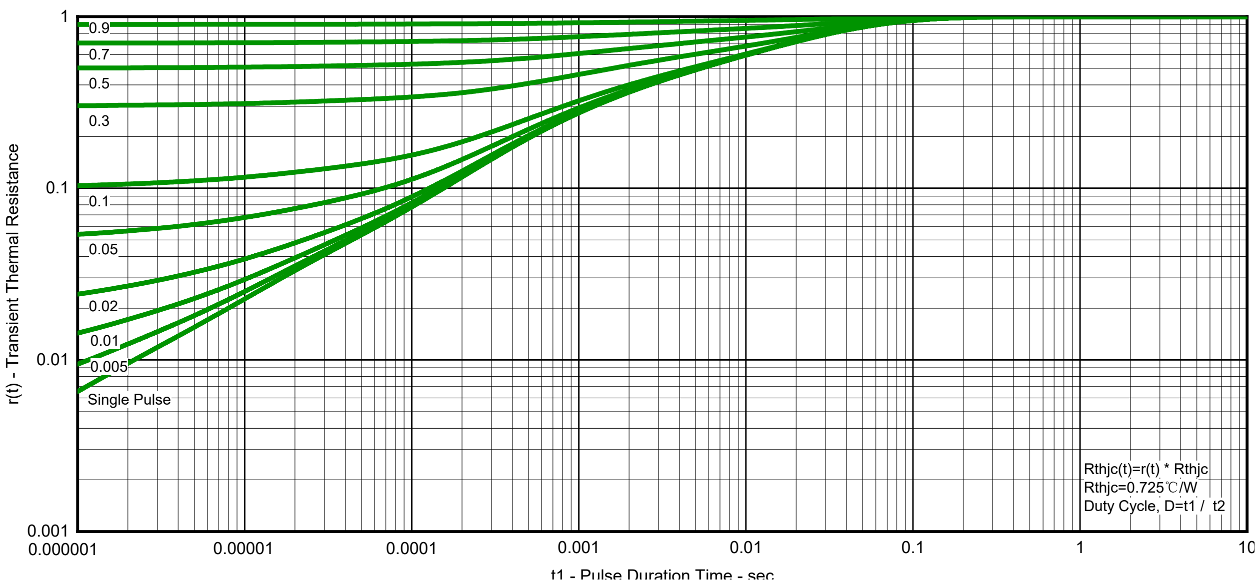
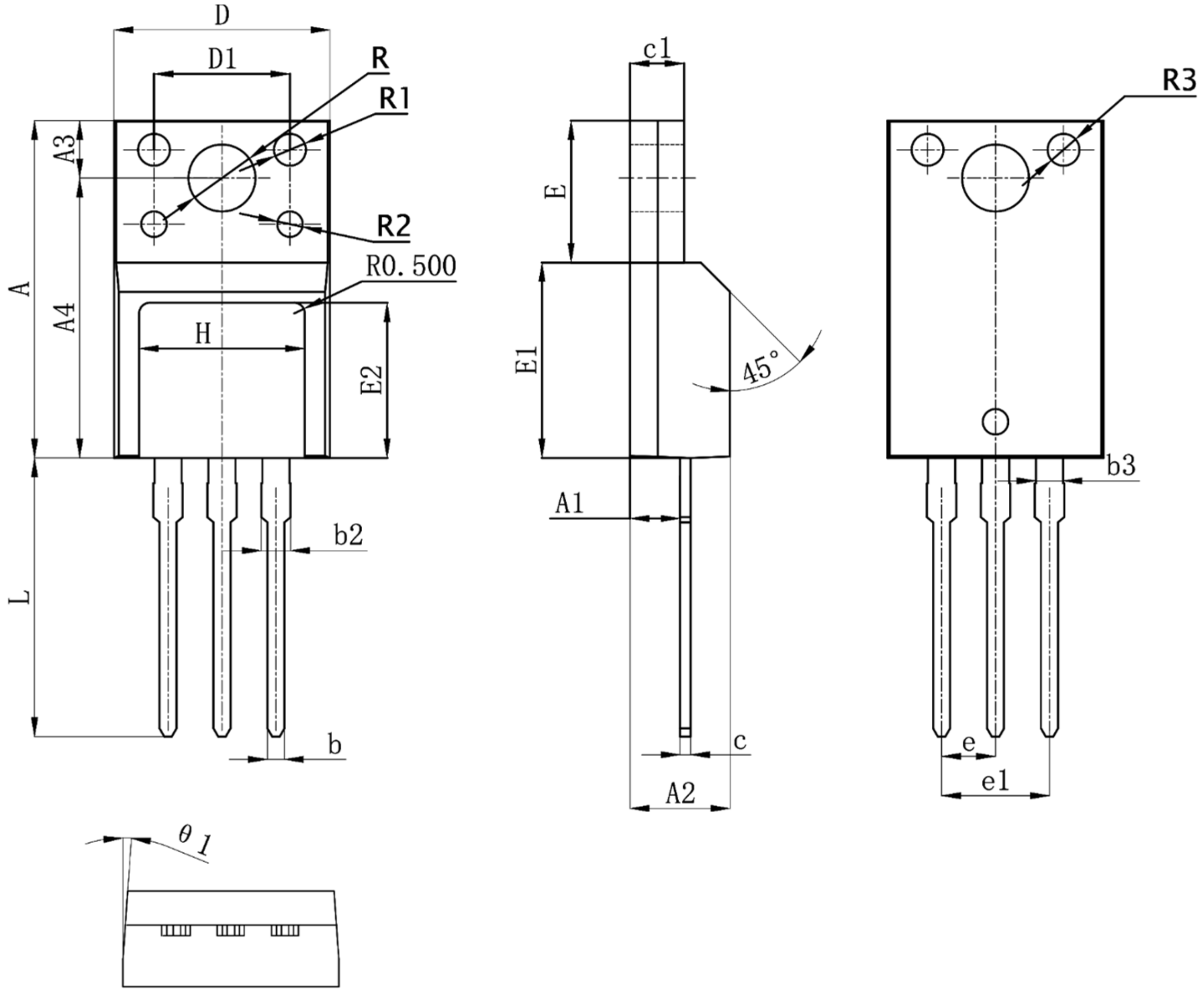


Fig.10 Transient Thermal Resistance

Product Dimension (TO-220F)



Dim	Millimeters		Inches		Dim	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	15.67	16.07	0.617	0.633	E	6.48	6.88	0.255	0.271
A1	2.15	2.55	0.085	0.100	E1	8.99	9.39	0.354	0.370
A2	4.50	4.90	0.177	0.193	E2	7.10	7.50	0.280	0.295
A3	3.10	3.50	0.122	0.138	e	2.54 BSC		0.100 BSC	
A4	12.27	12.87	0.483	0.507	e1	5.08 BSC		0.200 BSC	
b	0.77	0.83	0.030	0.033	L	13.14	13.54	0.517	0.533
b2	1.20	1.40	0.047	0.055	R	3.10	3.50	0.122	0.138
b3	1.20 BSC		0.047 BSC		R1	1.50 Ref.		0.059 Ref.	
c	0.40	0.60	0.016	0.024	R2	1.20 Ref.		0.047 Ref.	
c1	2.44	2.64	0.096	0.104	R3	1.50 Ref.		0.059 Ref.	
D	9.86	10.46	0.388	0.412	H	7.60	8.00	0.299	0.315
D1	6.90	7.10	0.272	0.280	θ1	4°	5°	4°	5°

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