Prisemi®

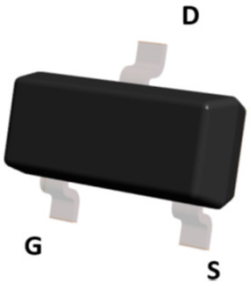
PNMT20V3A

N-Channel MOSFET

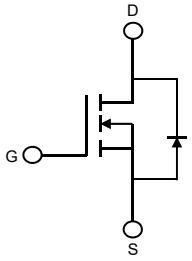
Description

The MOSFET provide the best combination of fast switching , low on-resistance and cost-effectiveness.

- Trench Power MV MOSFET technology
- Voltage controlled small signal switch
- Low input Capacitance
- Fast Switching Speed
- Low Input / Output Leakage



Top View

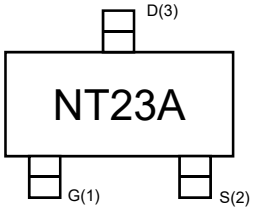


Circuit Diagram

MOSFET Product Summary		
V_{DS}(V)	$R_{DS(on)}$(mΩ)	I_D(A)
20	29@V_{GS}=4.5V	3.0

Applications

- Battery operated systems
- Solid-state relays
- Direct logic-level interface: TTL/CMOS



Marking (Top View)

Absolute maximum rating@25℃

Rating	Symbol	Value	Units
Drain-source Voltage	V_{DS}	20	V
Gate-source Voltage	V_{GS}	±10	V
Drain Current	I_D	3.0	A
Pulsed Drain Current	I_{DM}	13	A
Total Power Dissipation[1)]	P_D	0.8	W
Junction and Storage Temperature Range	T_J,T_{STG}	-55~+150	℃

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case[2)]	$R_{\theta JC}$	-	29	-	℃/W
Thermal Resistance, Junction-to-Ambient[2)]	$R_{\theta JA}$	-	124	-	℃/W

Notes:
1. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout
2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout

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	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20V,V_{GS} = 0V	-	-	1.0	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±10V, V_{DS} = 0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.45	0.6	1.1	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 4A	-	29	40	mΩ
		V_{GS} = 2.5V, I_D = 3A	-	36	50	
Gate resistance	R_g	V_{DS}=0V,V_{GS}=0V,f=1MHz	-	4.5	-	Ω
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_S = 1A	-	0.76	1.2	V
Maximum Body-Diode Continuous Current	I_S	-	-	-	1.6	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS} = 10V,V_{GS} = 0V, f = 1MHz	-	312	-	pF
Output Capacitance	C_{oss}		-	63	-	
Reverse Transfer Capacitance	C_{rss}		-	59	-	
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = 10V, I_D= 1A, V_{GS} = 4.5V,R_G = 6Ω	-	4.8	-	ns
Turn-on Rise Time	t_r		-	6.4	-	
Turn-Off Delay Time	$t_{d(off)}$		-	23	-	
Turn-Off Fall Time	t_f		-	10	-	
Total Gate Charge	Q_g	V_{DS}= 10V,I_D= 3.6A, V_{GS}= 4.5V	-	9.0	-	nC
Gate-Source Charge	Q_{gs}		-	0.4	-	
Gate-Drain Charge	Q_{gd}		-	1.3	-	

Typical Characteristics

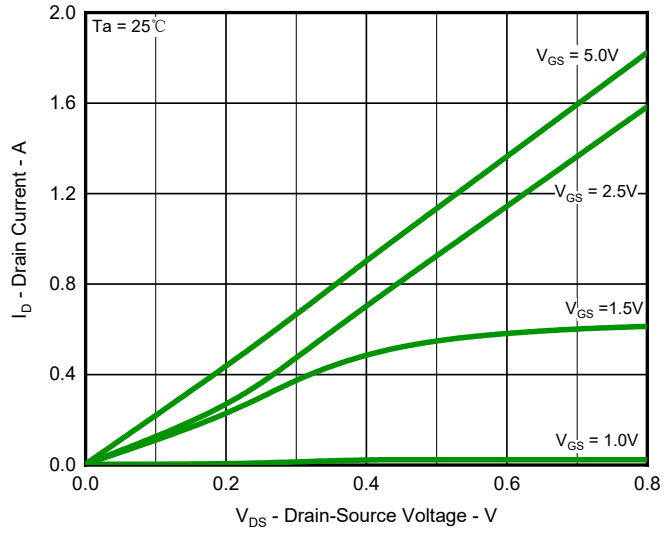


Fig.1 Output Characteristics

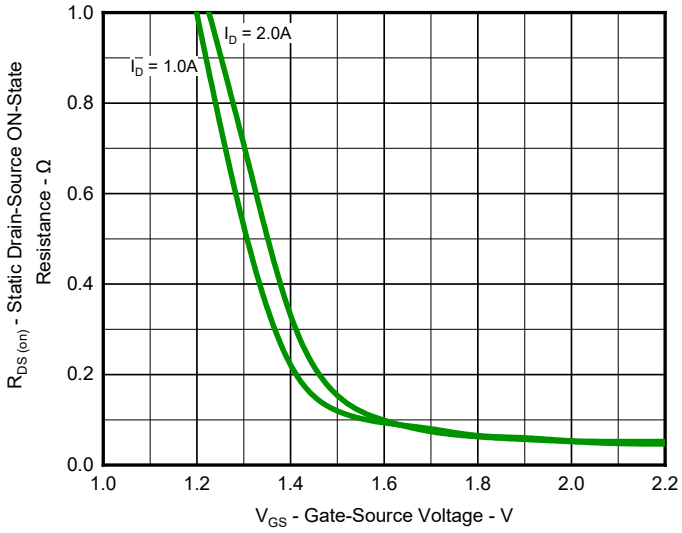


Fig.2 On-Resistance vs. Gate-Source Voltage(I)

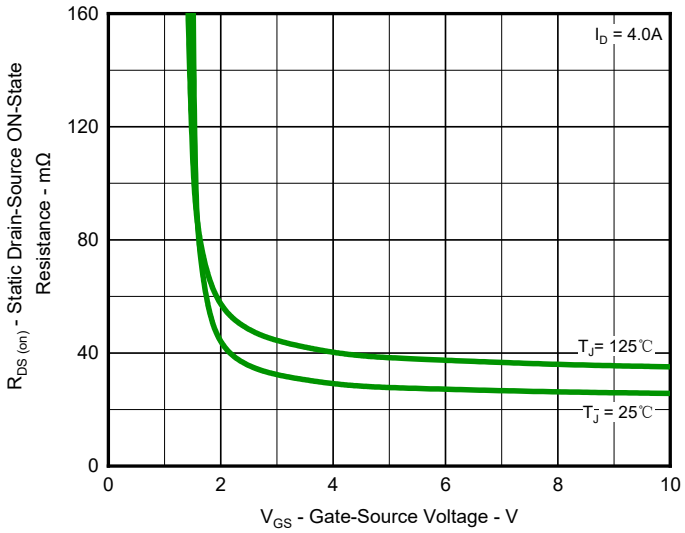


Fig.3 On-Resistance vs. Gate-Source Voltage(II)

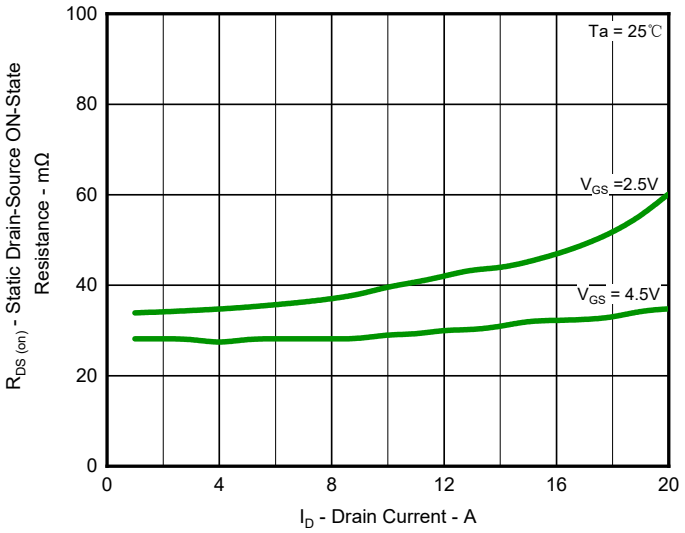


Fig.4 On-Resistance vs. Drain Current

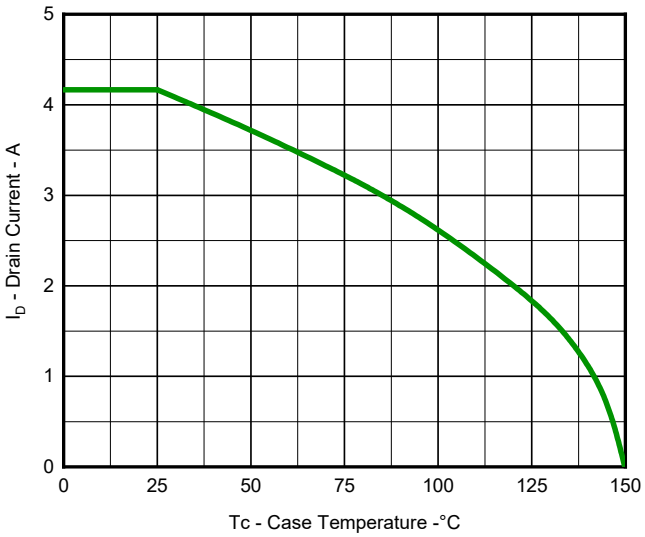


Fig.5 Maximun Drain Current vs. Case Temperature

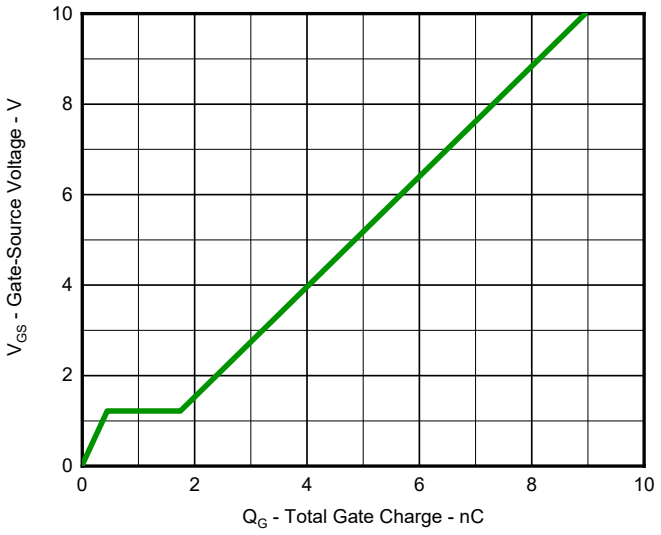


Fig.6 Gate Charge Characteristics

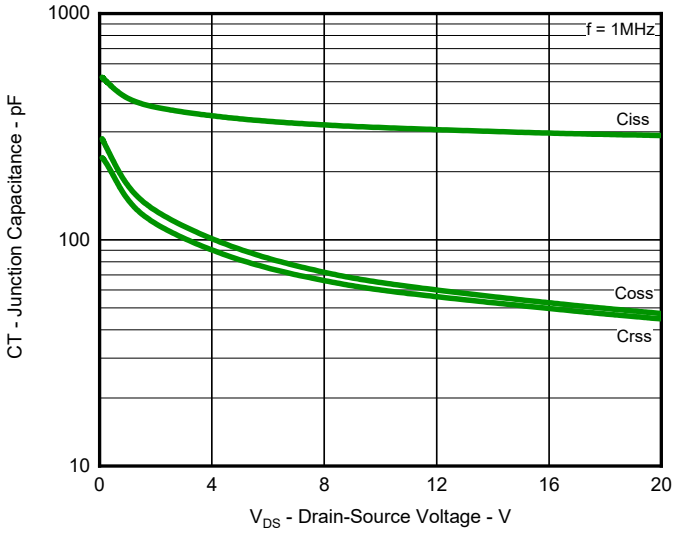


Fig.7 Typical Junction Capacitance

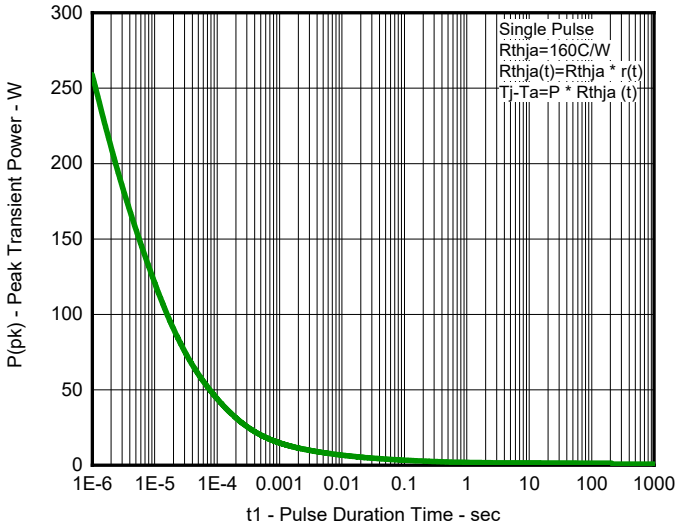


Fig.8 Single Pulse Maximum Power Dissipation

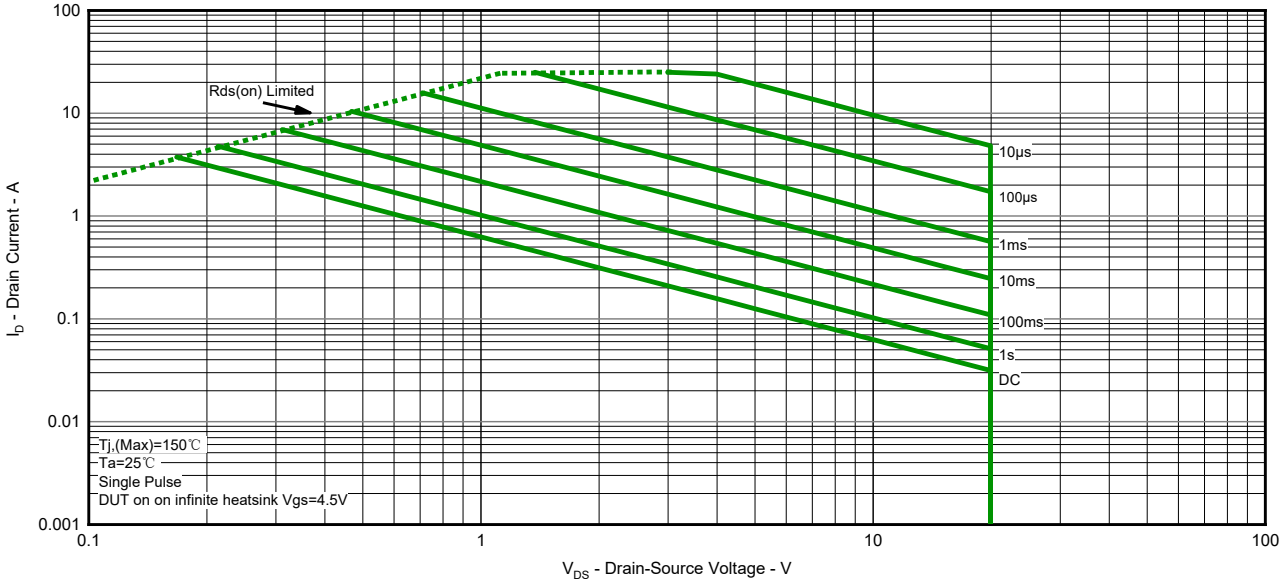


Fig.9 Safe Operation Area

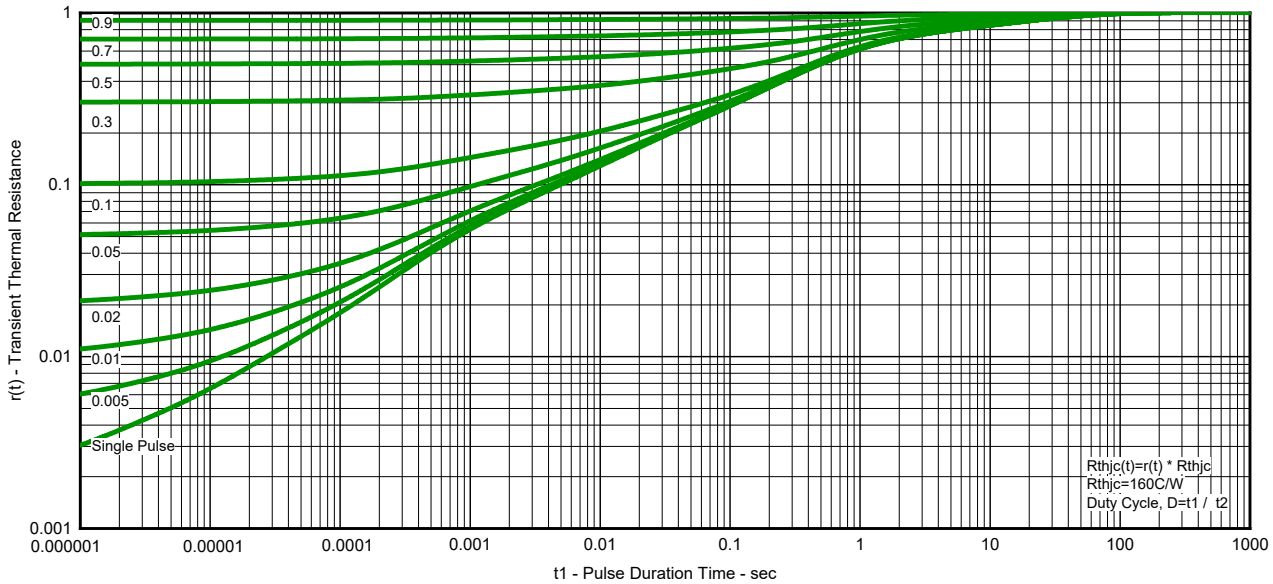
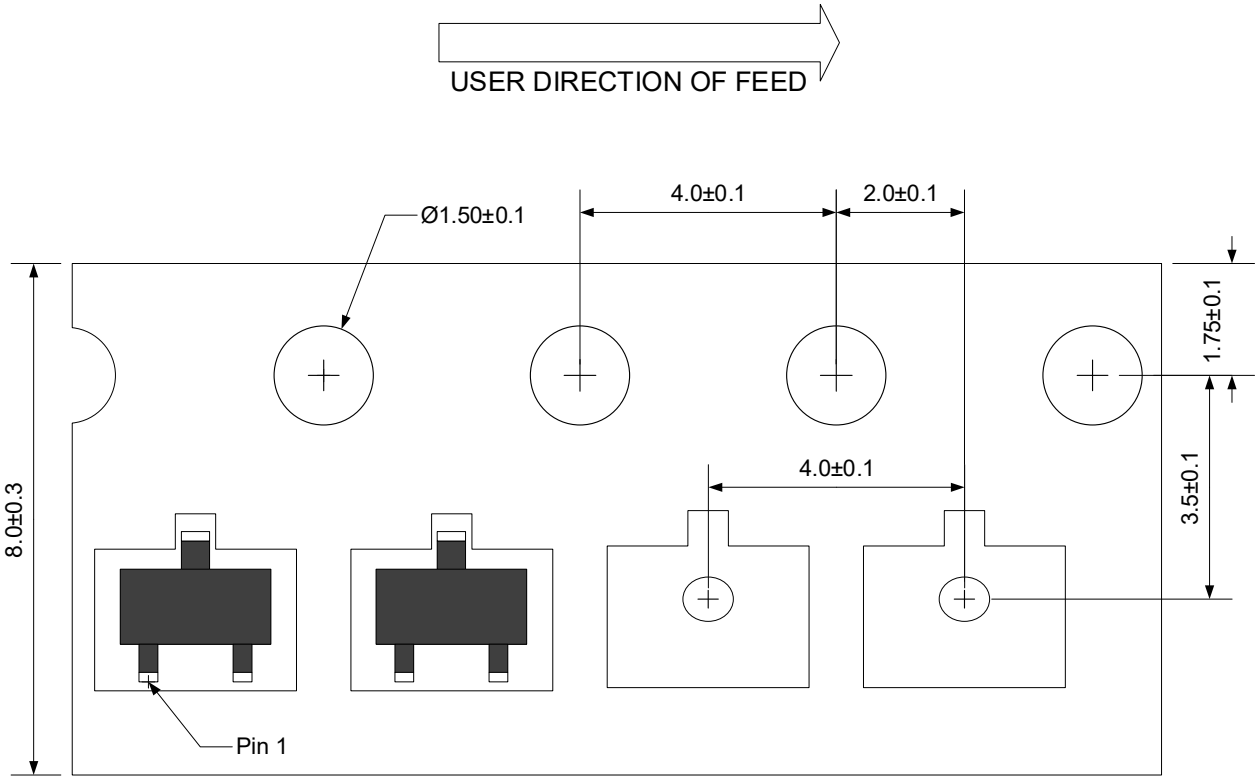


Fig.10 Transient Thermal Resistance

Ordering information

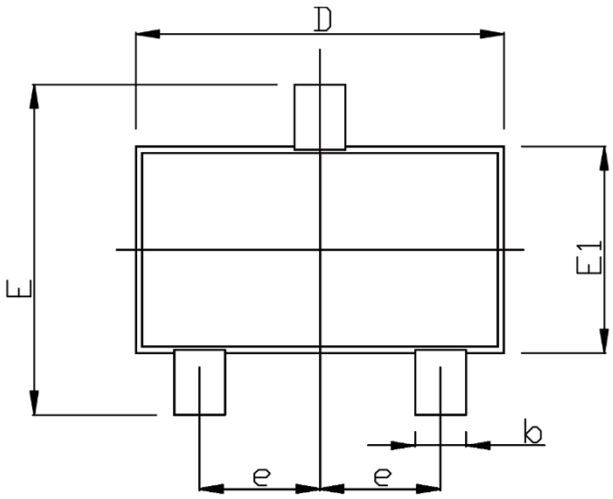
Device	Package	Reel	Shipping
PNMT20V3A	SOT-23 (Pb-Free)	7"	3000 / Tape & Reel

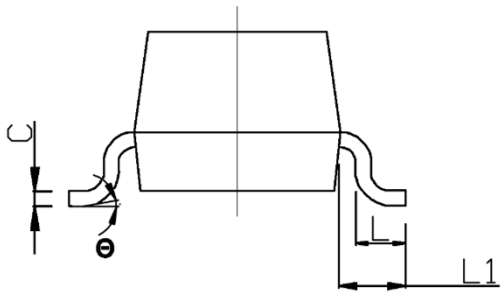
Load with information

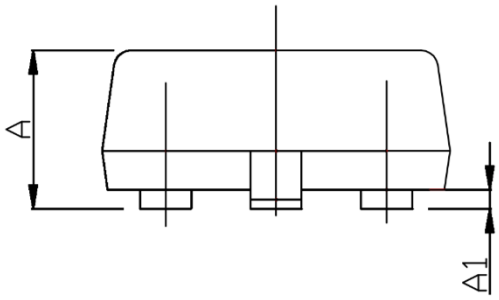


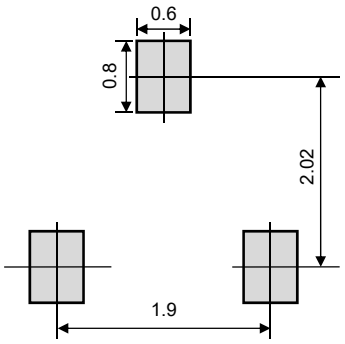
Unit:mm

Product dimension (SOT-23)









Suggested PCB Layout

Unit:mm

Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	-	1.35	-	0.053
A1	0.04	0.15	0.002	0.006
b	0.30	0.50	0.012	0.020
c	0.08	0.21	0.003	0.008
D	2.72	3.12	0.107	0.123
E	2.10	2.64	0.083	0.104
E1	1.10	1.50	0.043	0.059
e	0.95 BSC		0.037 BSC	
L	0.20	0.48	0.008	0.019
L1	0.50	0.60	0.020	0.024
θ	0°	8°	0°	8°

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