

Small Signal MOSFET 115mAmps, 60 Volts N–Channel

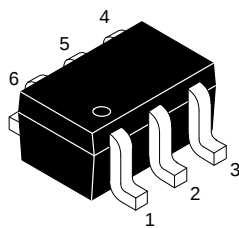
FEATURES:

- ESD Protected : 1000V
- We declare that the material of product compliance with RoHS requirements and Halogen Free.

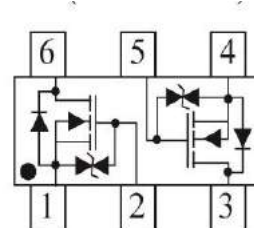
APPLICATIONS:

- Low Side Load Switch
- Level Shift Circuits
- DC–DC Converter

Circuit Diagram & Pin Configuration:



SOT363/SC-88



DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
2N7002DW1-S03T	702	3000/Tape&Reel

MAXIMUM RATINGS(Ta = 25°C)

Parameter	Symbol	Limits	Unit
Drain–Source Voltage	VDSS	60	Vdc
Drain–Gate Voltage (RGS = 1.0 MΩ)	VDGR	60	Vdc
Drain Current	ID	±115	mAdc
– Continuous TC = 25°C		±75	
TC = 100°C			
– Pulsed (Note 1)	IDM	±800	
Gate–Source Voltage	VGS	±20	Vdc
– Continuous			
– Non–repetitive (tp ≤ 50μs)	VGSM	±40	Vdc

THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Total Device Dissipation, Per Device FR-5 Board (Note 2) @ TA = 25°C Derate above 25°C	PD	380 250 3.0	mW mW/°C
Thermal Resistance, Junction-to-Ambient(Note 2)	R θ JA	328	°C/W
Junction and Storage temperature	TJ,Tstg	-55~+150	°C

1. Pulse Test: Pulse Width $\leq$ 300 μ s, Duty Cycle $\leq$ 2.0%.
2. FR-5 = 1.0×0.75×0.062 in.

ELECTRICAL CHARACTERISTICS (Ta= 25°C)
OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain–Source Breakdown Voltage (VGS = 0, ID = 10 μ Adc)	VBRDSS	60	-	-	Vdc
Zero Gate Voltage Drain Current (VGS = 0, VDS = 60 Vdc)	IDSS	-	-	1.0	μ Adc
		-	-	500	
Gate–Body Leakage Current, Forward (VGS = 20 Vdc)	IGSSF	-	-	1.0	μ Adc
Gate–Body Leakage Current, Reverse (VGS = - 20 Vdc)	IGSSR	-	-	-1.0	μ Adc

ON CHARACTERISTICS (Note 3)

Gate Threshold Voltage (VDS = VGS, ID = 250 μ Adc)	VGS(th)	1.0	-	2.0	Vdc
On–State Drain Current (VDS $\geq$ 2.0 VDS(on), VGS = 10 Vdc)	ID(on)	500	-	-	mA
Static Drain–Source On–State Voltage (VGS = 10 Vdc, ID = 500 mAdc) (VGS = 5.0 Vdc, ID = 50 mAdc)	VDS(on)	-	-	3.75	Vdc
		-	-	0.375	
Static Drain–Source On–State Resistance (VGS = 10 Vdc, ID = 500 mAdc) TC = 25°C TC = 125°C (VGS = 5.0 Vdc, ID = 50 mAdc) TC = 25°C TC = 125°C	RDS(on)	-	-	7.5	Ohms
		-	-	13.5	
		-	-	7.5	
		-	-	13.5	
Forward Transconductance (VDS $\geq$ 2.0 VDS(on), ID = 200 mAdc)	gfs	80	-	-	mmhos

DYNAMIC CHARACTERISTICS

Input Capacitance (VDS = 25 Vdc, VGS = 0, f = 1.0 MHz)	Cibo	-	-	50	pF
Output Capacitance (VDS = 25 Vdc, VGS = 0, f = 1.0 MHz)	Cobo	-	-	25	pF
Reverse Transfer Capacitance (VDS = 25 Vdc, VGS = 0, f = 1.0 MHz)	Cibo	-	-	5.0	pF

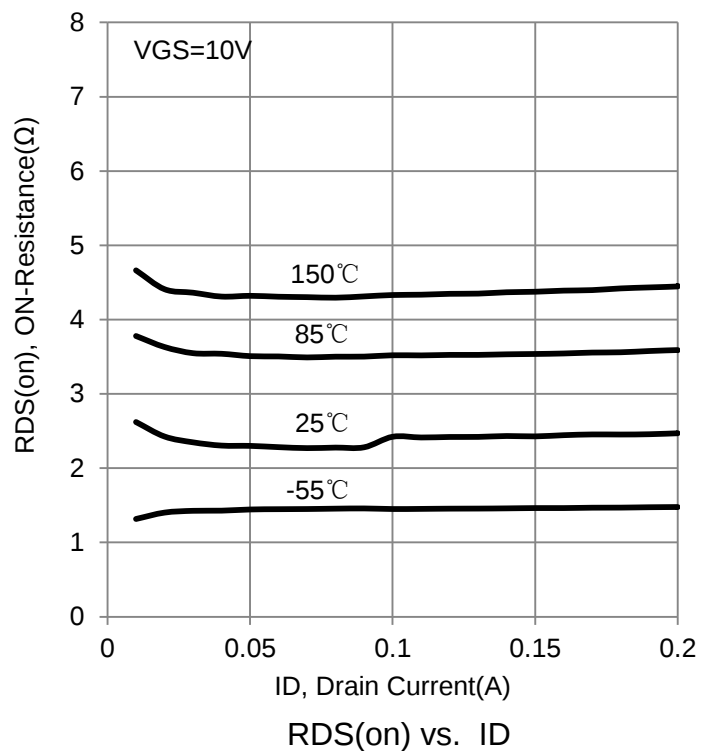
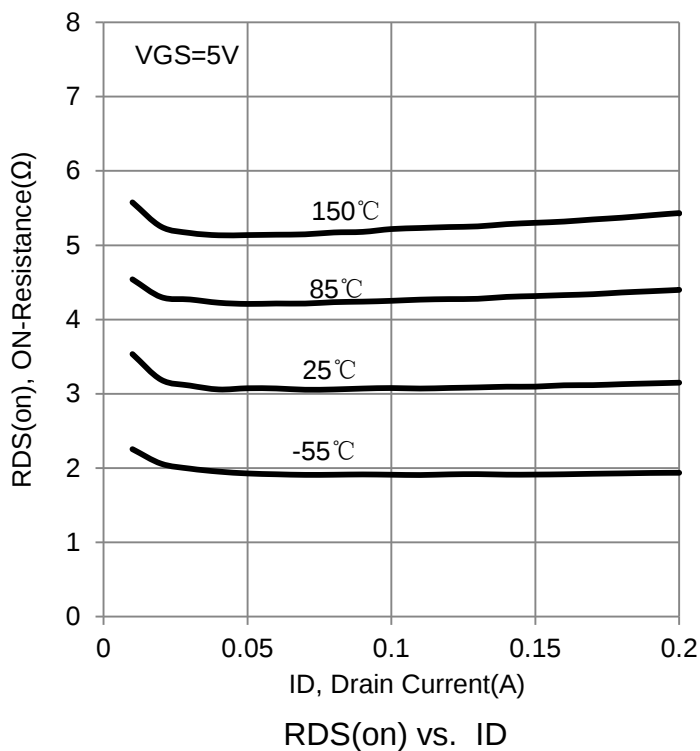
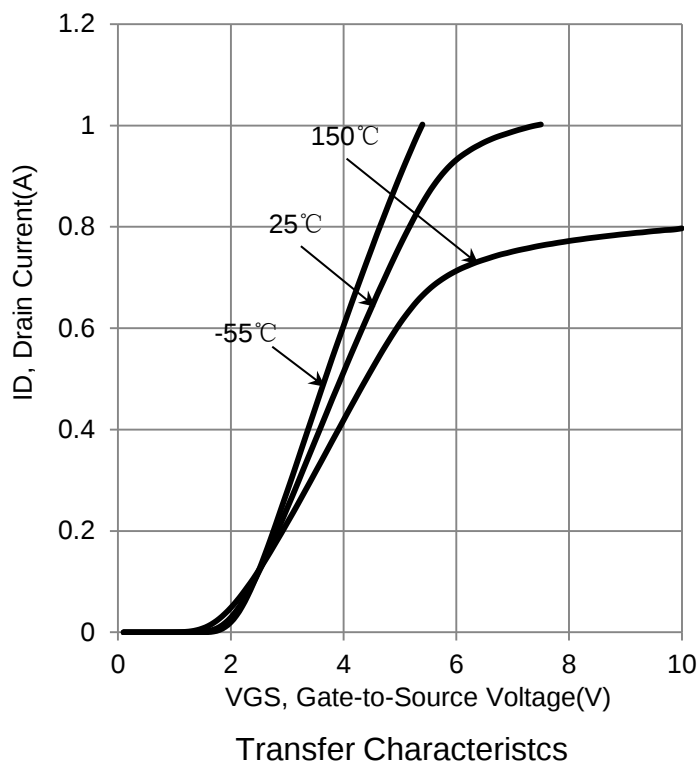
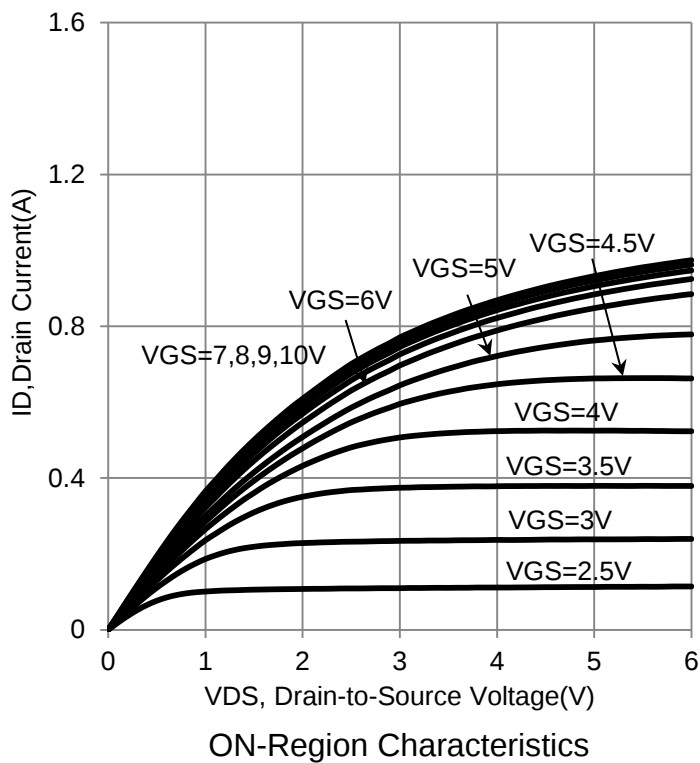
SWITCHING CHARACTERISTICS

Turn-On Delay Time	(VDD = 25 Vdc, ID = 500 mAdc, RG = 25 Ω , RL = 50 Ω , Vgen = 10 V)	td(on)	-	-	20	ns
Turn-Off Delay Time		td(off)	-	-	40	

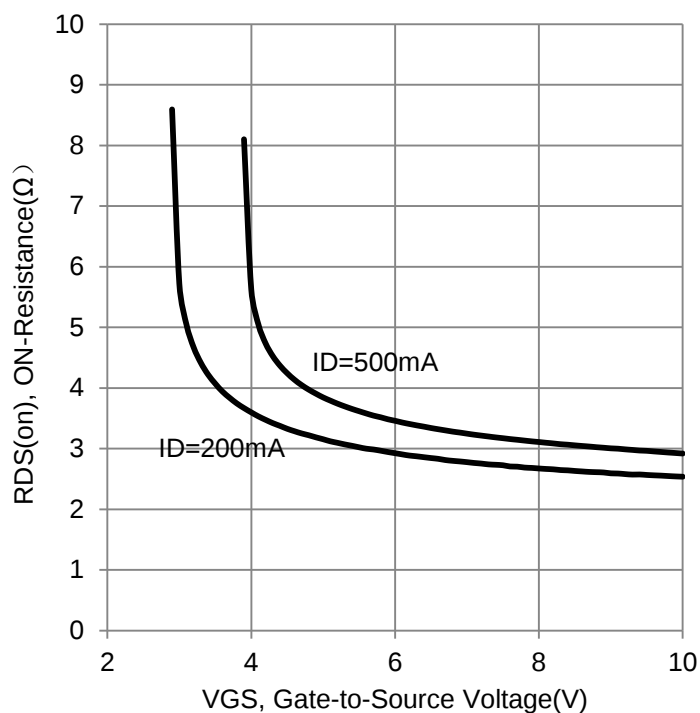
BODY–DRAIN DIODE RATINGS

Diode Forward On–Voltage (IS = 115 mAdc, VGS = 0 V)	VSD	-	-	-1.5	Vdc
Source Current Continuous (Body Diode)	IS	-	-	-115	mAdc
Source Current Pulsed	ISM	-	-	-800	mAdc

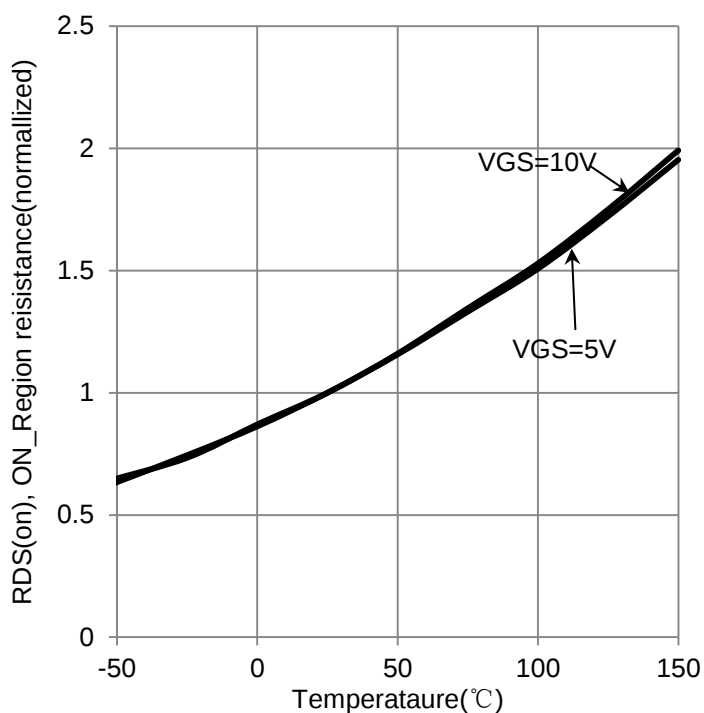
3. Pulse Test: Pulse Width $\leq$ 300 μ s, Duty Cycle $\leq$ 2.0%.

ELECTRICAL CHARACTERISTICS CURVES


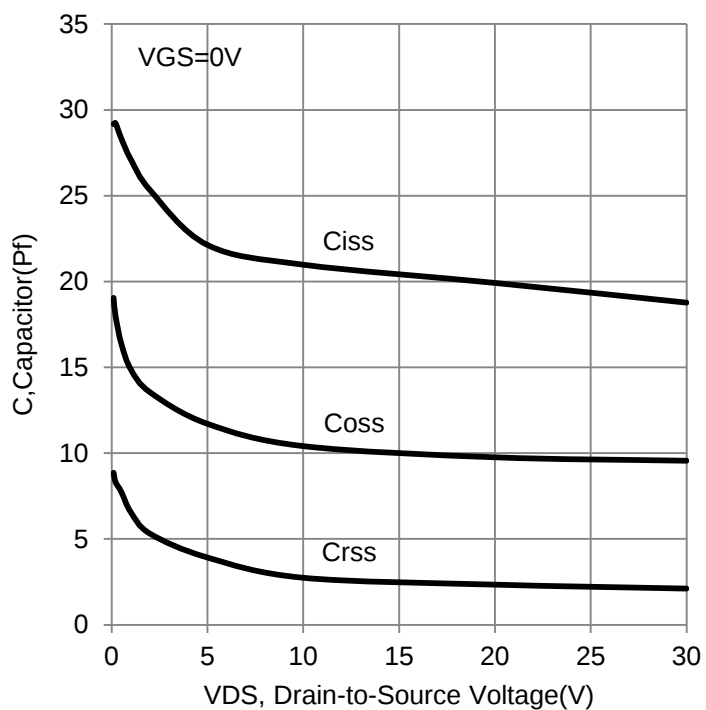
ELRCTRICAL CHARACTERISTICS CURVES (Con.)



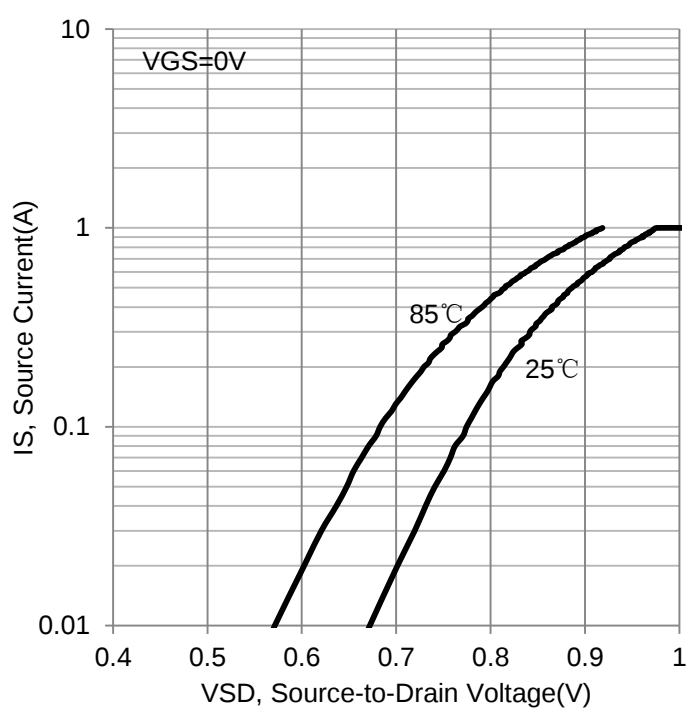
RDS(on) vs. VGS



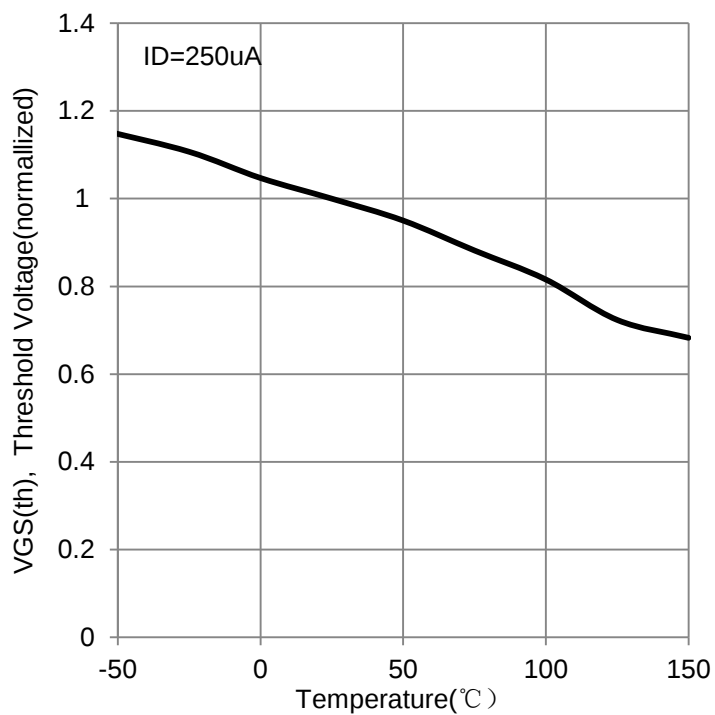
RDS(on) vs. Temperature



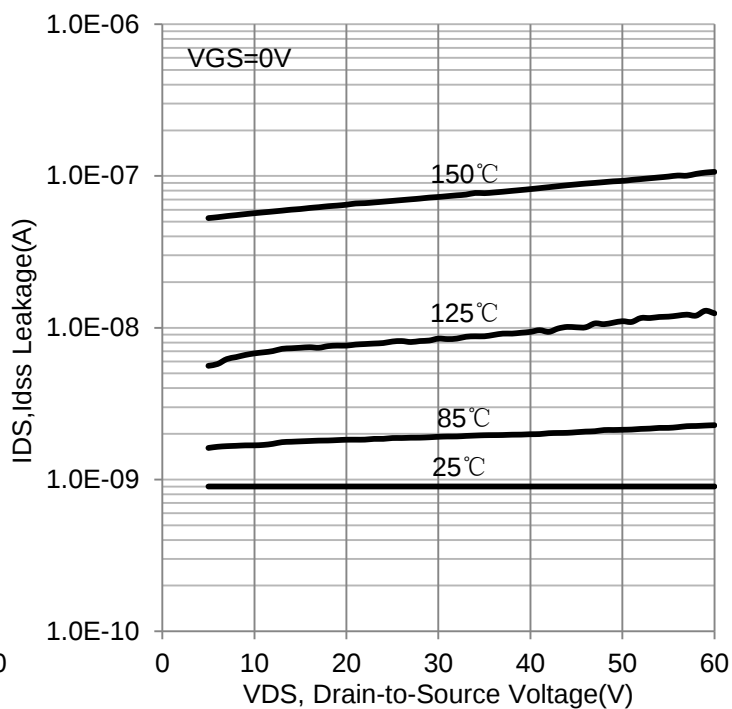
Capacitor vs. VDS



I_S vs. VSD

ELECTRICAL CHARACTERISTICS CURVES (Con.)


$V_{GS(th)}$ vs. Temperature

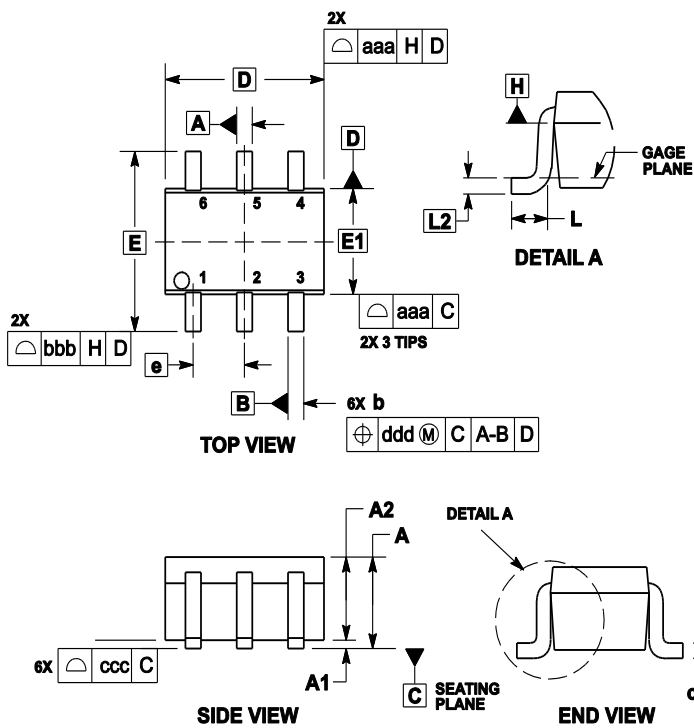


I_{DS} vs. V_{DS}

OUTLINE AND DIMENSIONS

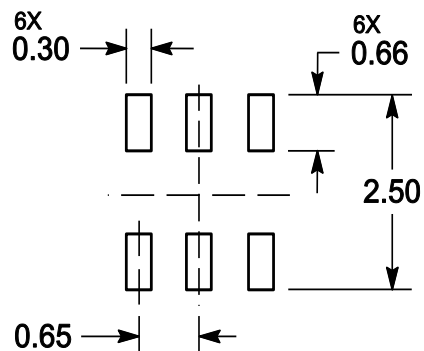
Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.



DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.10	---	---	0.043
A1	0.00	---	0.10	0	---	0.004
A2	0.70	0.90	1.00	0.027	0.035	0.039
b	0.15	0.20	0.25	0.006	0.008	0.01
C	0.08	0.15	0.22	0.003	0.006	0.009
D	1.80	2.00	2.20	0.07	0.078	0.086
E	2.00	2.10	2.20	0.078	0.082	0.086
E1	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.26	0.36	0.46	0.010	0.014	0.018
L2	0.15 BSC			0.006 BSC		
aaa	0.15			0.01		
bbb	0.30			0.01		
ccc	0.10			0.00		
ddd	0.10			0.00		

SOLDERING FOOTPRINT



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