

2N7002KT

S-2N7002KT

Small Signal MOSFET
380 mAmps, 60 Volts N-Channel

1. FEATURES

- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- S- prefix for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.
- ESD Protected

2. DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
2N7002KT	RK	3000/Tape&Reel

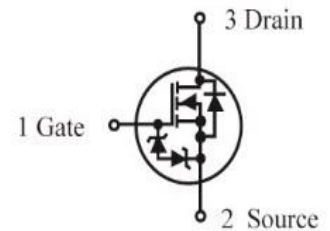
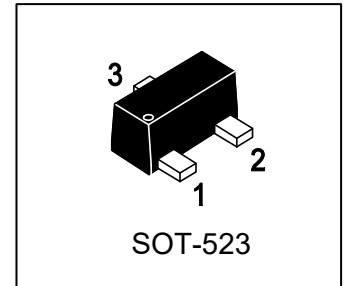
3. MAXIMUM RATINGS(Ta = 25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	VDSS	60	V
Gate-Source Voltage	VGS	±20	V
Drain Current	ID		mA
– Steady State TA = 25°C		320	
TA = 85°C		230	
– t<5s TA = 25°C		380	
TA = 85°C		270	
Pulsed Drain Current (tp=10µs)	IDM	1.5	A
Source Current (Body Diode)	IS	300	mA

4. THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Total Device Dissipation(Note 1)	PD		mW
– Steady State		300	
– t<5s		420	
Junction-to-Ambient(Note 1)	RθJA		°C/W
– Steady State		417	
– t<5s		300	
Lead Temperature for Soldering Purposes (1/8 " from case for 10 s)	TL	260	°C
Junction and Storage temperature	TJ,Tstg	-55~+150	°C
Gate-Source ESD Rating(HBM, Method 3015)	ESD	2000	V

1. FR-5 = 1.0×0.75×0.062 in.



5. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain–Source Breakdown Voltage (VGS = 0, ID = 250μA)	VBRDSS	60	-	-	V
Drain-to–Source Breakdown Voltage Temperature Coefficient	VBRDSS/TJ	-	71	-	mV/°C
Zero Gate Voltage Drain Current (VGS = 0, VDS = 60 V)	IDSS	TJ = 25°C	-	1.0	μA
		TJ = 125°C	-	500	
(VGS = 0, VDS = 50 V)		-	-	100	nA
Gate–Body Leakage Current, Forward (VGS = 20 V)	IGSSF	-	-	10	μA
Gate–Body Leakage Current, Reverse (VGS = - 20 V)	IGSSR	-	-	-10	μA

ON CHARACTERISTICS (Note 2)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Gate Threshold Voltage (VDS = VGS, ID = 250μA)	VGS(th)	1.0	1.5	2	V
Negative Threshold Temperature Coefficient	VGS(TH)/TJ	-	4	-	mV/°C
Static Drain–Source On–State Resistance (VGS = 10 V, ID = 500 mA)	RDS(on)	-	-	2.3	Ohm
		(VGS = 5.0 V, ID = 50 mA)	-	-	
Forward Transconductance (VDS = 5.0 V, ID = 200 mA)	gfs	80	-	-	mS

DYNAMIC CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Total Gate Charge (VDS = 10V, VGS = 4.5V, ID = 0.5A)	Qg	-	360	-	pC
Gate-Source Charge (VDS = 10V, VGS = 4.5V, ID = 0.5A)	Qgs	-	90	-	
Gate-Drain Charge (VDS = 10V, VGS = 4.5V, ID = 0.5A)	Qgd	-	210	-	
Input Capacitance (VDS = 25 V, VGS = 0, f = 1.0 MHz)	Ciss	-	34	-	pF
Output Capacitance (VDS = 25 V, VGS = 0, f = 1.0 MHz)	Coss	-	3	-	pF
Reverse Transfer Capacitance (VDS = 25 V, VGS = 0, f = 1.0 MHz)	Crss	-	2.2	-	pF

SWITCHING CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Turn-On Delay Time	td(on)	-	3.8	-	ns
Rise Time	tr	-	3.4	-	
Turn-Off Delay Time	td(off)	-	19	-	
Fall Time	tf	-	12	-	

VDS = 10 V, VGEN = 10 V,
ID = 500 mA

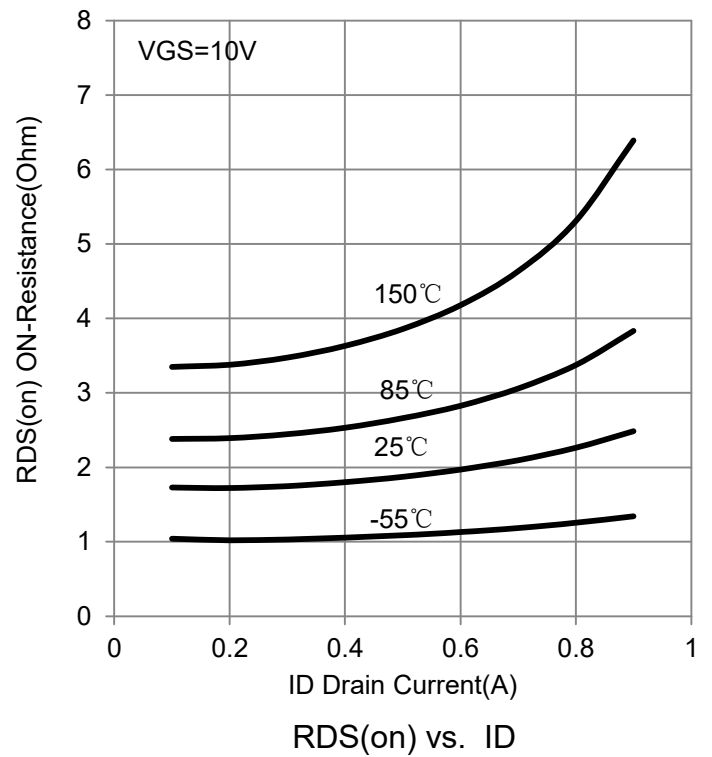
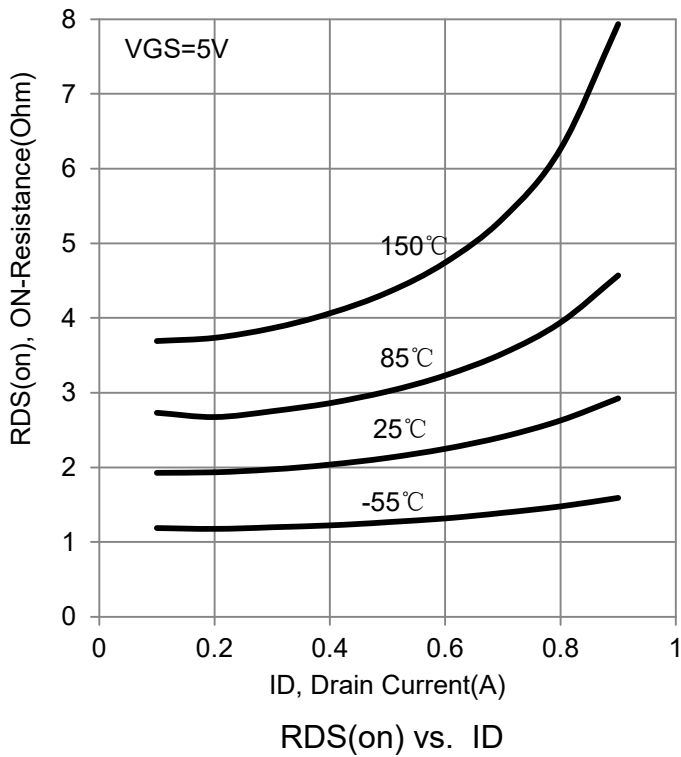
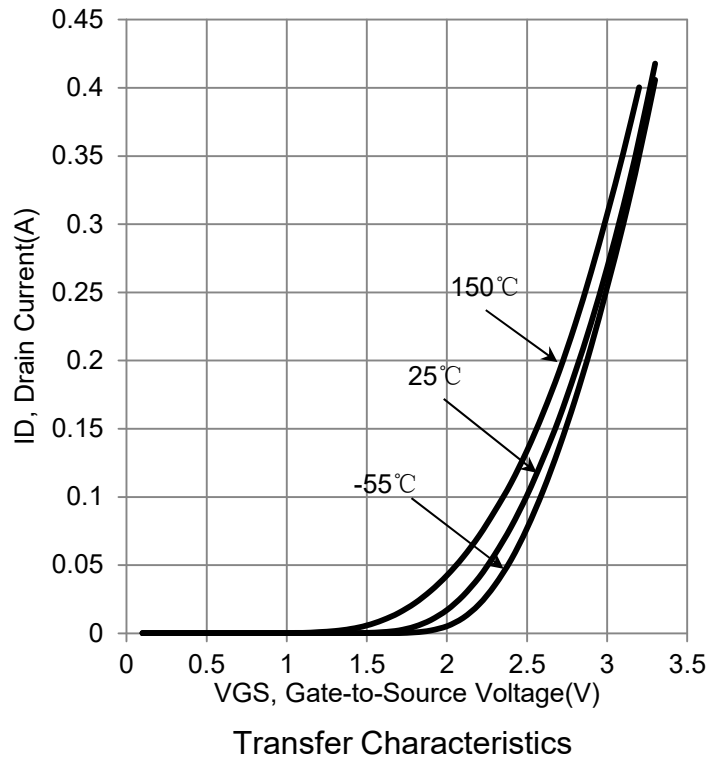
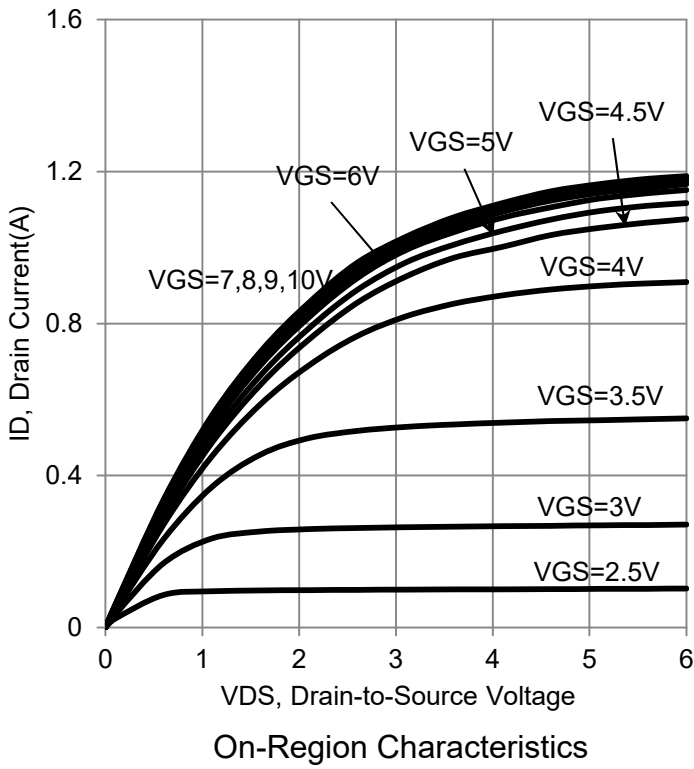
BODY–DRAIN DIODE RATINGS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Forward On–Voltage (IS = 115 mA, VGS = 0 V)	VSD	-	-	1.4	V
		-	0.7	-	

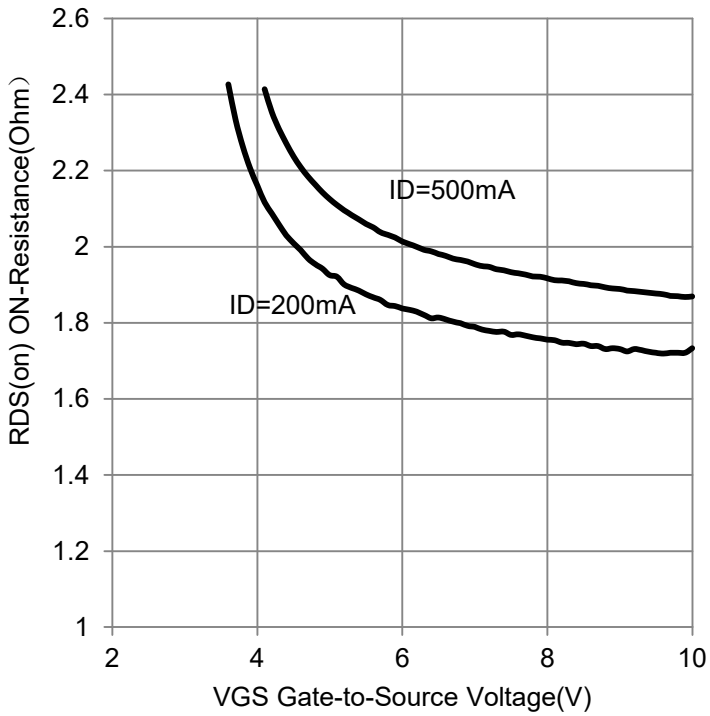
2.Pulse Test: Pulse Width ≤300 μs, Duty Cycle ≤2.0%.



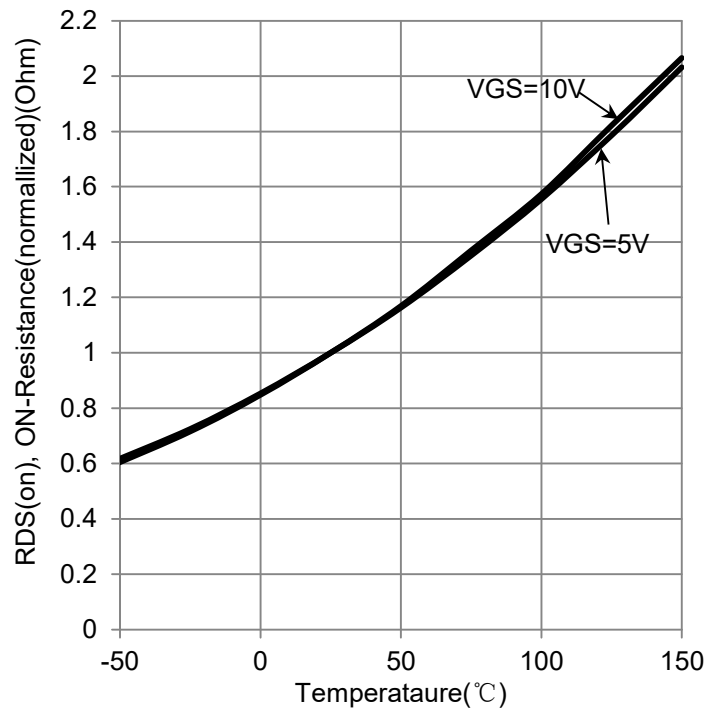
6. ELECTRICAL CHARACTERISTICS CURVES



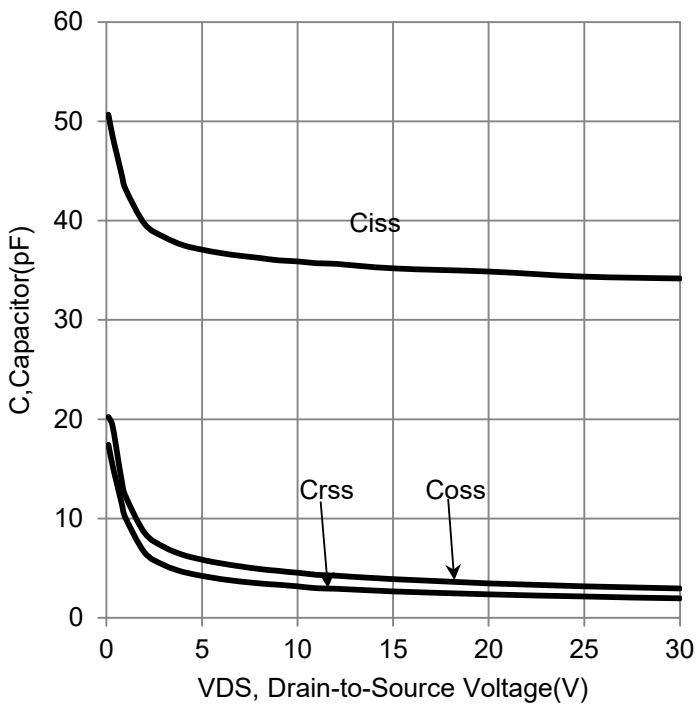
6. ELECTRICAL CHARACTERISTICS CURVES (Con.)



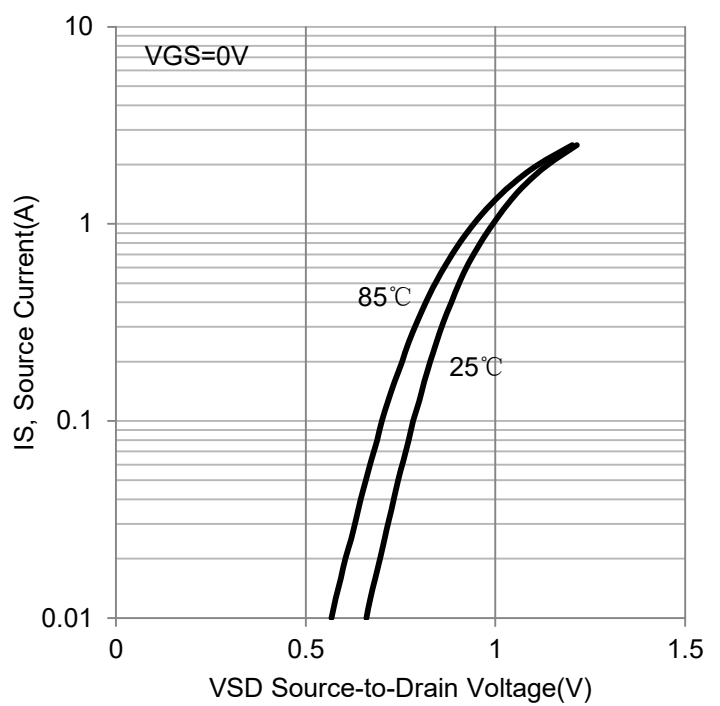
RDS(on) vs. VGS



RDS(on) vs. Temperature



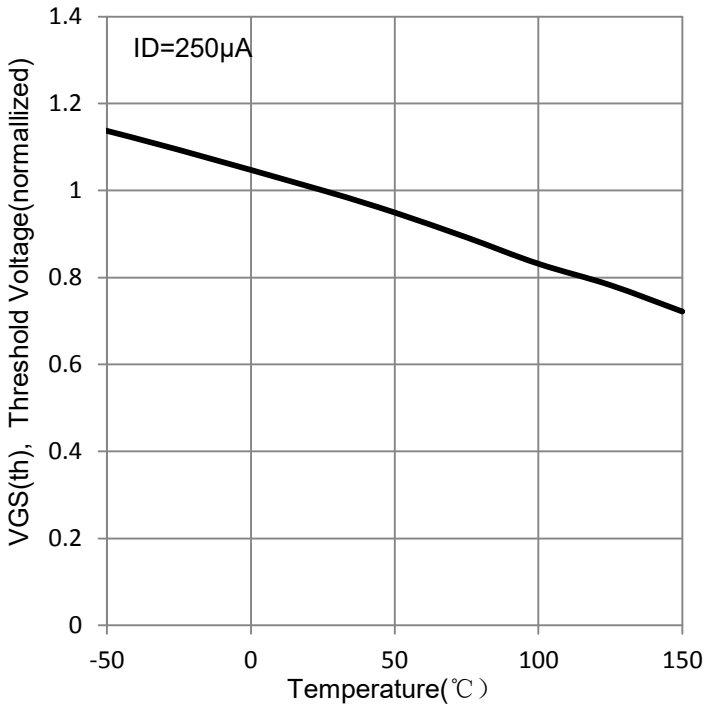
Capacitor vs. VDS



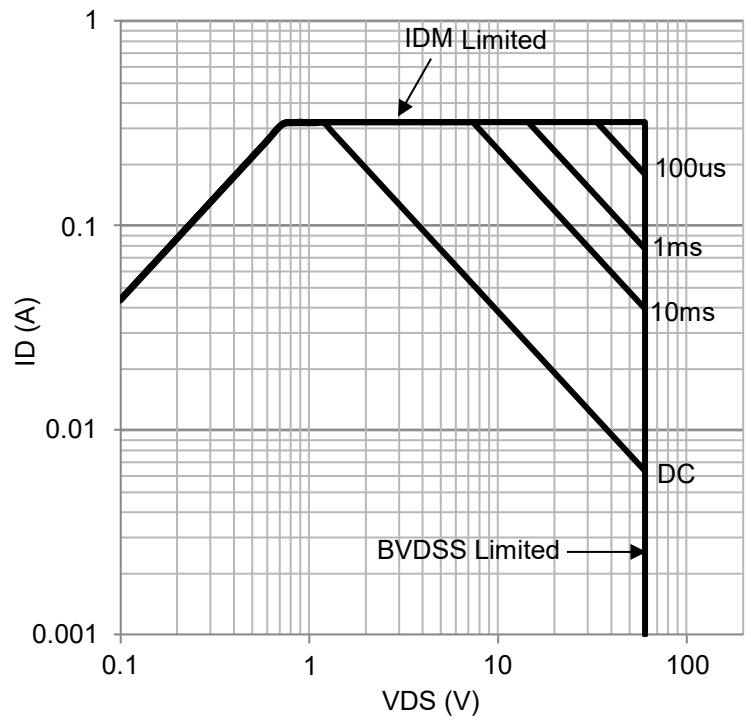
IS vs. VSD



6. ELECTRICAL CHARACTERISTICS CURVES (Con.)



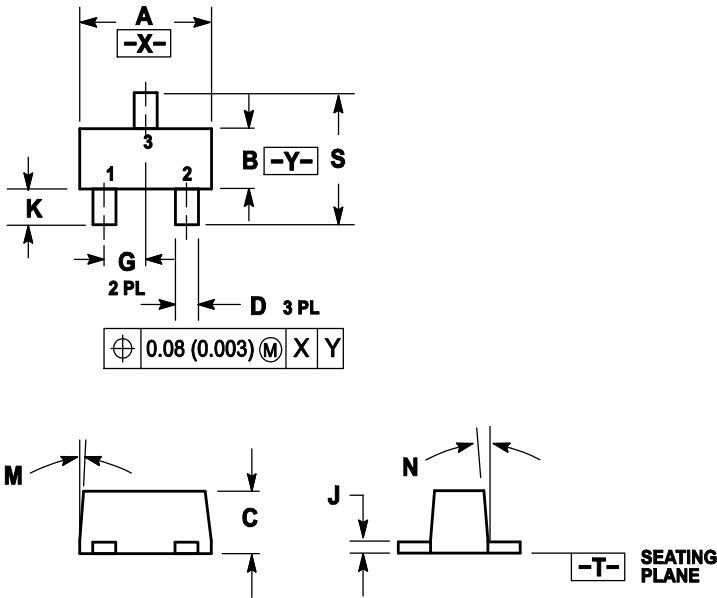
VGS(th) vs. Temperature



Safe Operating Area



7. 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 A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.50	1.60	1.70	0.059	0.063	0.067
B	0.75	0.85	0.95	0.030	0.034	0.040
C	0.60	0.70	0.80	0.024	0.028	0.031
D	0.23	0.28	0.33	0.009	0.011	0.013
G	0.50BSC			0.020BSC		
H	0.53REF			0.021REF		
J	0.10	0.15	0.20	0.004	0.006	0.008
K	0.30	0.40	0.50	0.012	0.016	0.02
L	1.10REF			0.043REF		
M	---	---	10°	---	---	10°
N	---	---	10°	---	---	10°
S	1.50	1.60	1.70	0.059	0.063	0.067

8. SOLDERING FOOTPRINT

