

# L2N7002KN3T5G

## S-L2N7002KN3T5G

Small Signal MOSFET

380 mAmps, 60V N-Channel SOT-883

### 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
- Low RDS(on)
- Surface Mount Package

### 2. APPLICATIONS

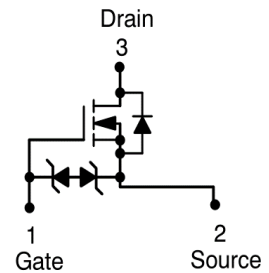
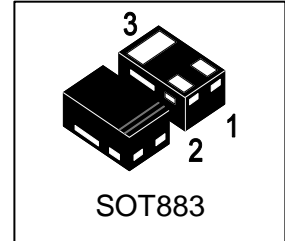
- Low Side Load Switch
- Level Shift Circuits
- DC-DC Converter
- Portable Applications i.e. DSC, PDA, Cell Phone, etc.

### 3. DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Shipping
L2N7002KN3T5G	RK	10000/Tape&Reel

### 4. 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



**5. THERMAL CHARACTERISTICS**

Parameter	Symbol	Limits	Unit
Power Dissipation (Note 1) – Steady State	PD	250	mW
Junction-to-Ambient(Note 1) – Steady State	R $\theta$ JA	500	°C/W
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. Surface-mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces)

**6. 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, TJ = 25°C)	IDSS	-	-	1.0	μA
(VGS = 0, VDS = 60 V, TJ = 125°C)		-	-	500	μA
(VGS = 0, VDS = 50 V, TJ = 25°C)		-	-	100	nA
Gate-to–Source Leakage Current (VDS = 0 V, VGS = ±20 V)	IGSS	-	-	±10	μA

**ON CHARACTERISTICS (Note 2)**

Gate Threshold Voltage (VDS = VGS, ID = 250μA)	VGS(th)	1.0	-	2.5	V
Negative Threshold Temperature Coefficient	VGS(TH)/TJ	-	4	-	mV/°C
Drain–Source On–State Resistance (VGS = 10 V, ID = 500 mA)	RDS(on)	-	-	2.3	Ω
(VGS = 5.0 V, ID = 50 mA)		-	-	2.7	
Forward Transconductance (VDS = 5.0 V, ID = 200 mA)	gfs	-	80	-	S

**CHARGES AND CAPACITANCES**

Input Capacitance	(VGS = 0 V, f = 1 MHz, VDS = 25 V)	Ciss	-	32.8	-	pF
Output Capacitance		Coss	-	5.4	-	
Reverse Transfer Capacitance		Crss	-	2.9	-	
Total Gate Charge	(VGS = 4.5 V, VDS = 10 V, ID = 200 mA)	QG(TOT)	-	0.7	-	nC
Threshold Gate Charge		QG(TH)	-	0.1	-	
Gate-to–Source Charge		QGS	-	0.3	-	
Gate-to–Drain Charge		QGD	-	0.1	-	

**SWITCHING CHARACTERISTICS**

Turn-On Delay Time	(VGS = 10 V, VDD = 10 V, ID = 500 mA)	td(on)	-	9.9	-	ns
Rise Time		tr	-	5	-	
Turn-Off Delay Time		td(off)	-	39.4	-	
Fall Time		tf	-	17.9	-	

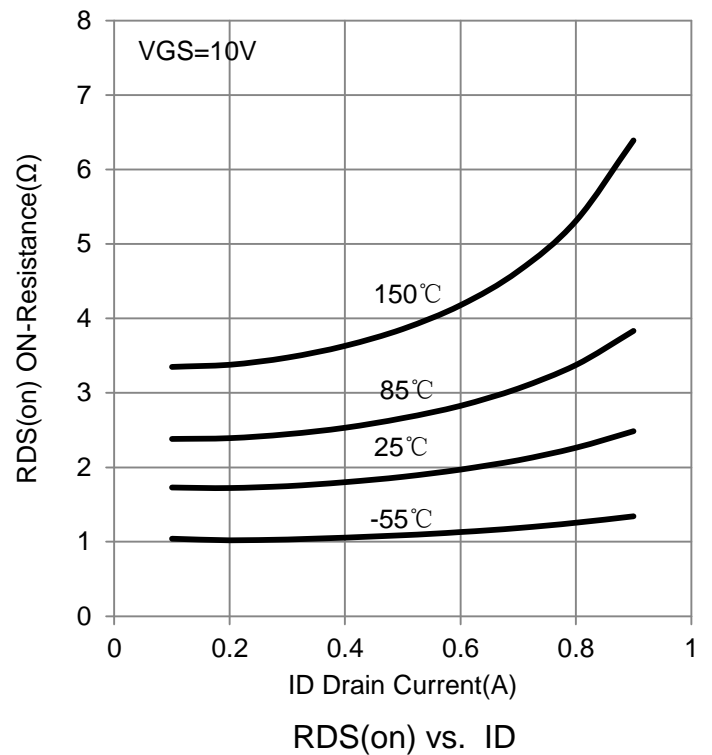
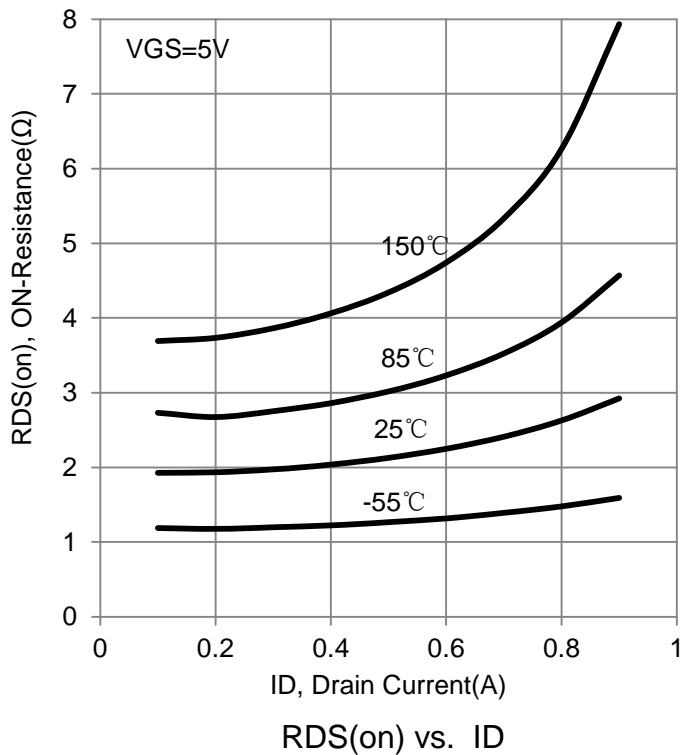
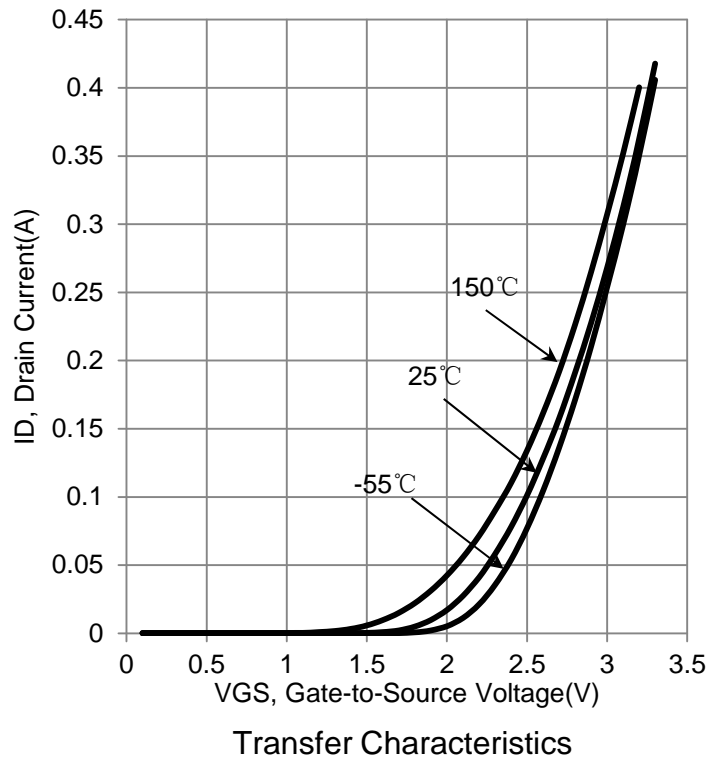
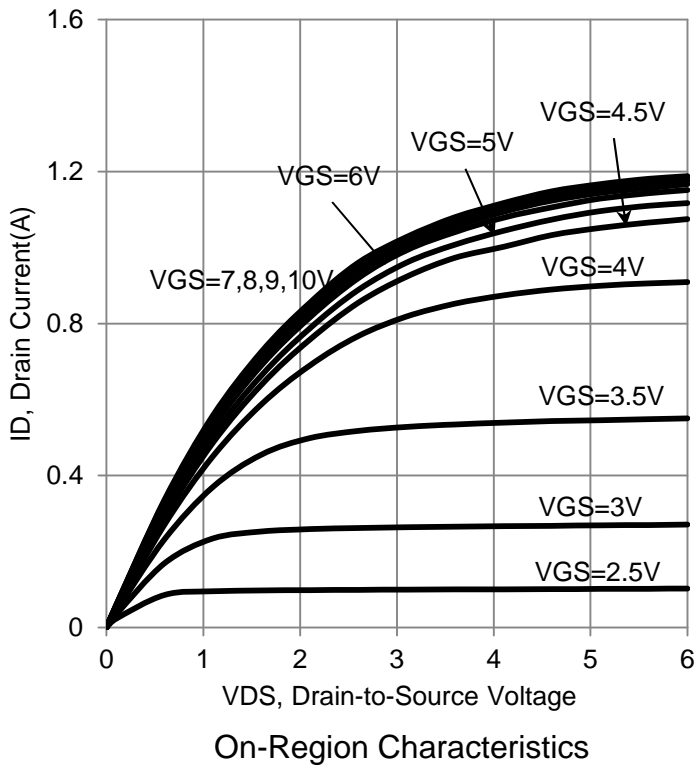
**DRAIN–SOURCE DIODE CHARACTERISTICS**

Diode Forward On–Voltage (IS = 115 mA, VGS = 0 V)	TJ = 25°C	VSD	-	-	1.4	V
	TJ = 85°C		-	0.7	-	

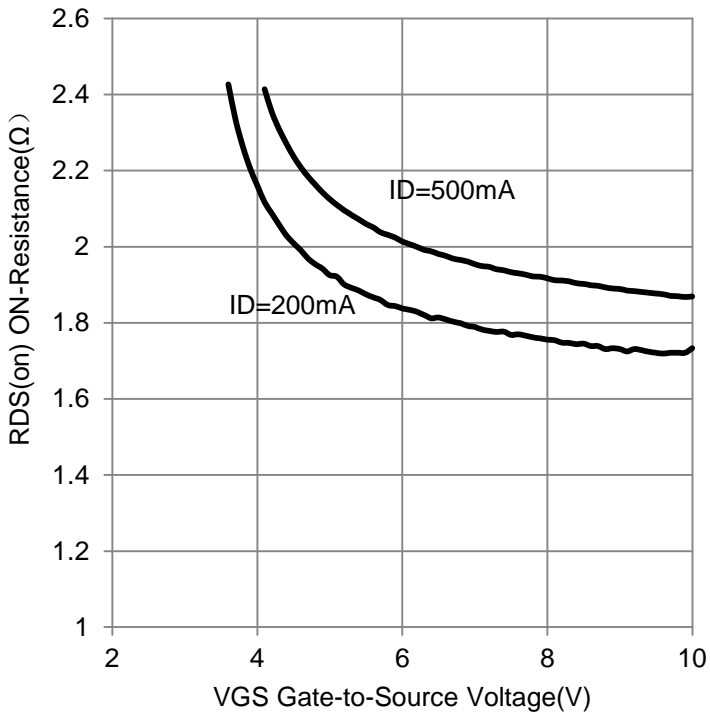
2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

3. Switching characteristics are independent of operating junction temperatures

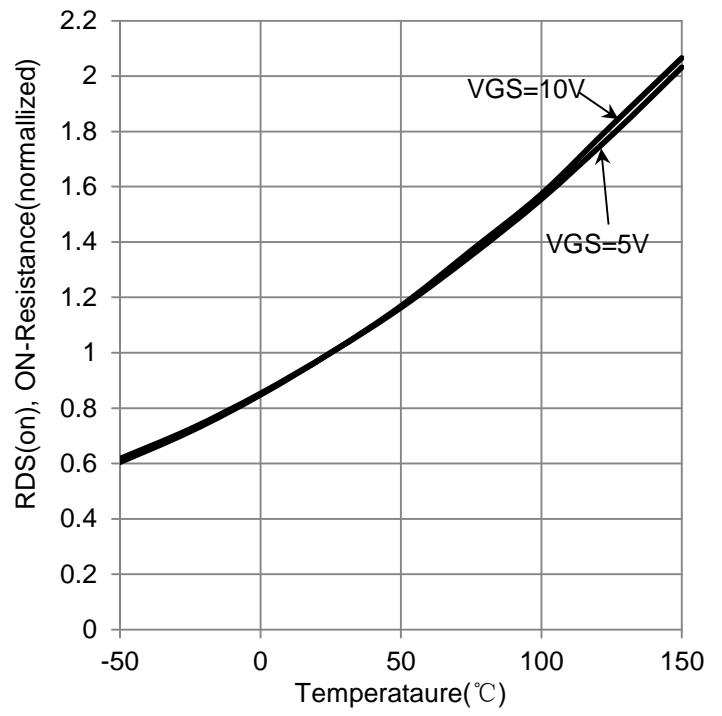
**7.ELECTRICAL CHARACTERISTICS CURVES**



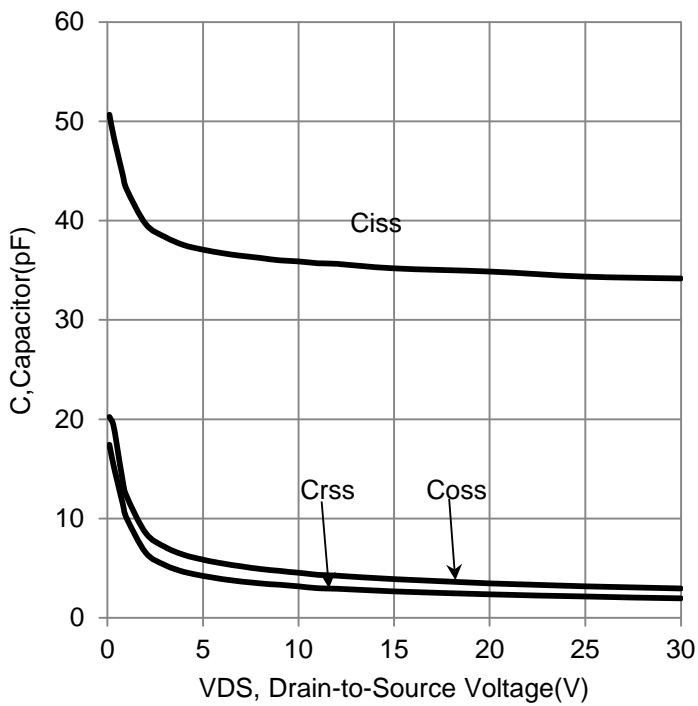
7.ELECTRICAL CHARACTERISTICS CURVES (Con.)



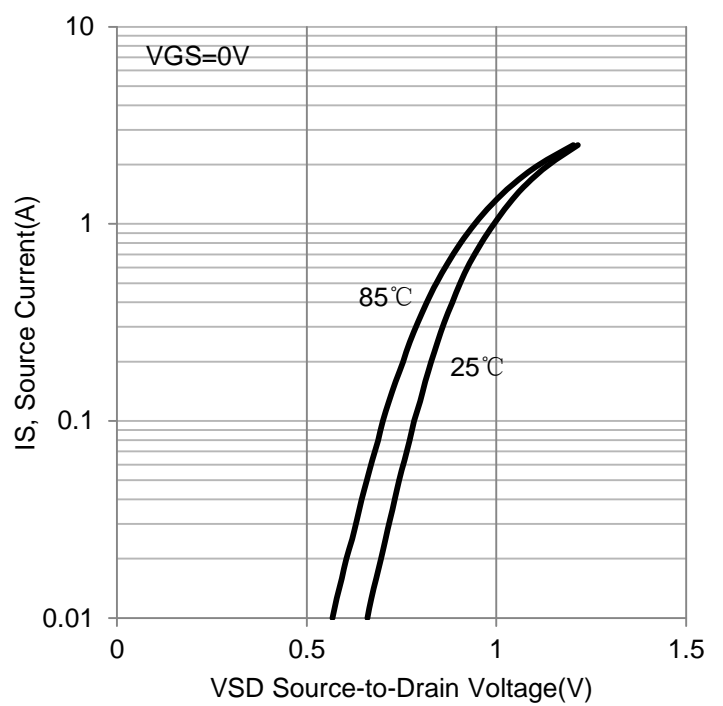
RDS(on) vs. VGS



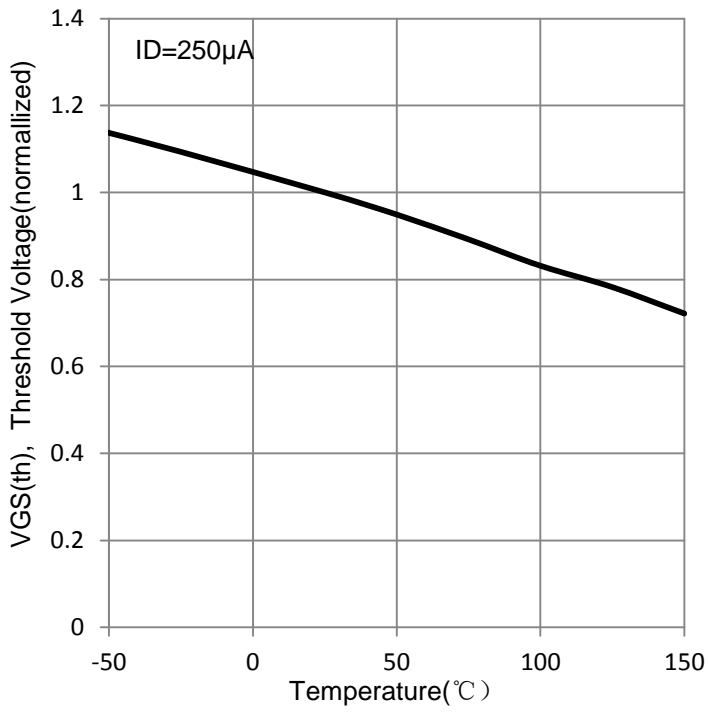
RDS(on) vs. Temperature



Capacitor vs. VDS

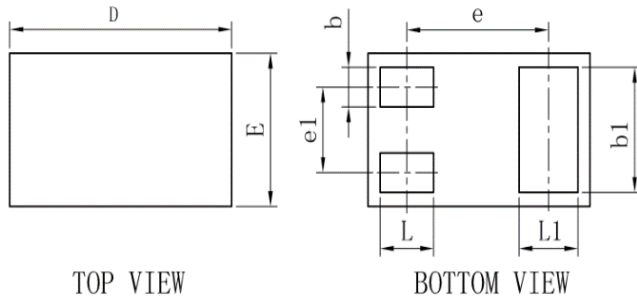


$I_S$  vs.  $V_{SD}$

**7.ELECTRICAL CHARACTERISTICS CURVES (Con.)**

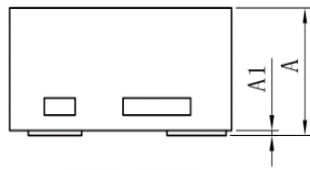
VGS(th) vs. Temperature

### 8. OUTLINE AND DIMENSIONS



TOP VIEW

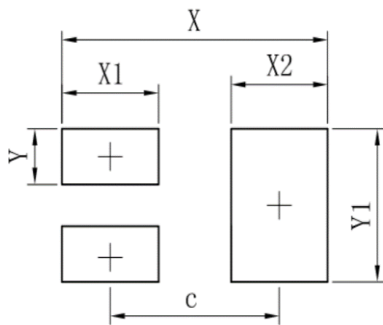
BOTTOM VIEW



SIDE VIEW

SOT883			
DIM	MIN	TYP	MAX
D	0.95	1.00	1.05
E	0.55	0.60	0.65
e	-	0.64	-
e1	-	0.34	-
L	0.19	0.24	0.29
L1	0.22	0.27	0.32
b	0.10	0.15	0.20
b1	0.44	0.49	0.54
A	0.43	0.48	0.53
A1	0	-	0.05
All Dimensions in mm			

### 9. SOLDERING FOOTPRINT



Dimensions	(mm)
c	0.70
X	1.10
X1	0.40
X2	0.40
Y	0.20
Y1	0.55