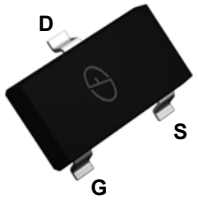
GOOD-ARK SEMICONDUCTOR

GS2N7002KL

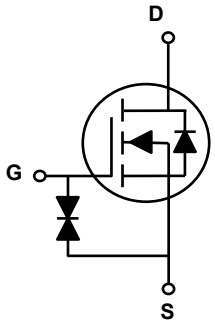
60V N-Channel MOSFET

Main Product Characteristics

V_{DS}	60V
$R_{DS(ON)}$	1.6Ω (Max.)
I_D	0.34A



SOT-23



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

Description

The GS2N7002KL utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State[1] (T_A=25°C)	I_D	0.34	A
Continuous Drain Current, @ Steady-State (T_A=70°C)		0.272	
Drain Current-Pulsed[2]	I_{DM}	1.5	A
Power Dissipation (T_A=25°C)	P_D	350	mW
Linear Derating Factor (T_A=25°C)		2.8	mW/°C
Junction-to-Ambient (PCB Mounted, Steady-State)[3]	$R_{\theta JA}$	357	°C/W
Operating Junction Temperature	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	60	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	-	-	1	μA
		T_J=125°C	-	-	50	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V	-	-	±100	nA
		V_{GS}=±10V	-	-	±50	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=0.3A	-	0.9	1.6	Ω
		V_{GS}=4.5V, I_D=0.2A	-	1	2	Ω
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	1	1.35	2.4	V
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}=30V, I_D=0.3A V_{GS}=10V	-	1.7	2.4	nC
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=30V, R_G=6Ω V_{GS}=10V, I_D=0.3A	-	5.5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	17.2	-	
Input Capacitance	C_{lss}	V_{DS}=30V, V_{GS}=0V, F=1MHz	-	16.4	-	pF
Output Capacitance	C_{oss}		-	10.5	-	
Reverse Transfer Capacitance	C_{rss}		-	5.6	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing theintegral reverse p-n junction diode.	-	-	0.34	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	0.68	A
Diode Forward Voltage	V_{SD}	VGS=0V, IS=0.3A	-	0.82	1.2	V
Reverse Recovery Time	trr	T_J=25°C, I_F=0.3A, di/dt=100A/μs,V_R=25V	-	30.2	-	ns

Note:

1. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

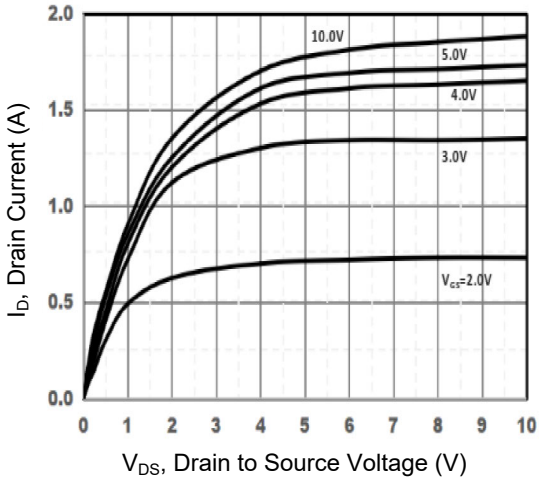


Figure 1. Output Characteristics

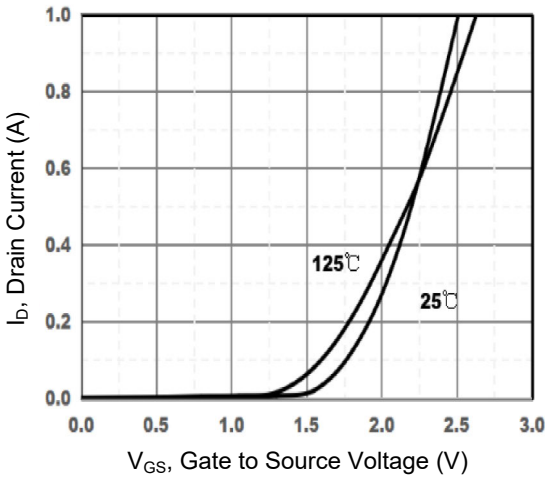


Figure 2. Transfer Characteristics

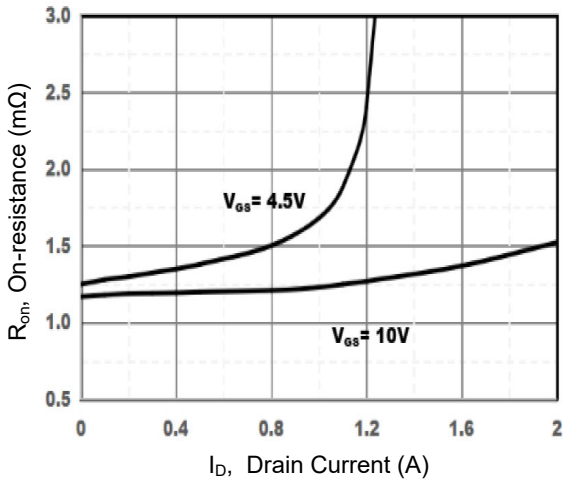


Figure 3. On-Resistance vs. I_D

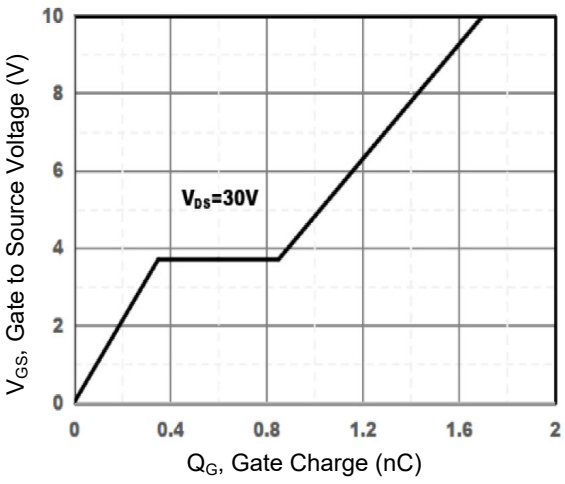


Figure 4. Gate Charge

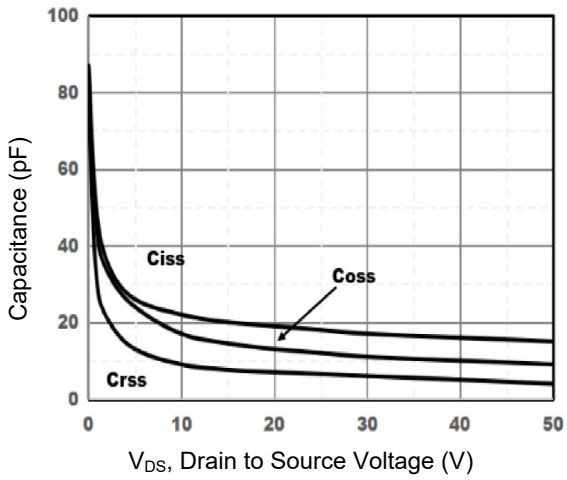


Figure 5. Capacitance Characteristics

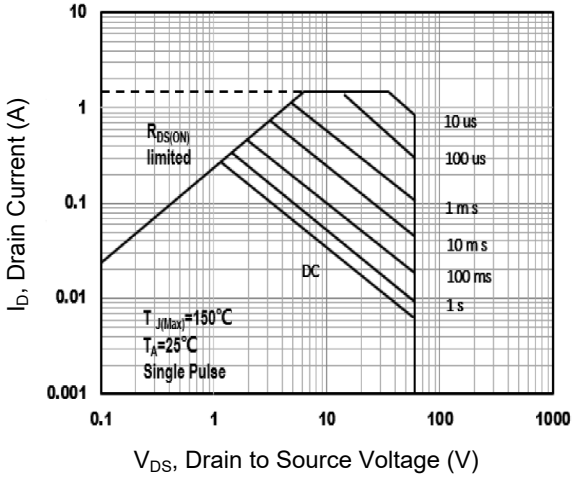
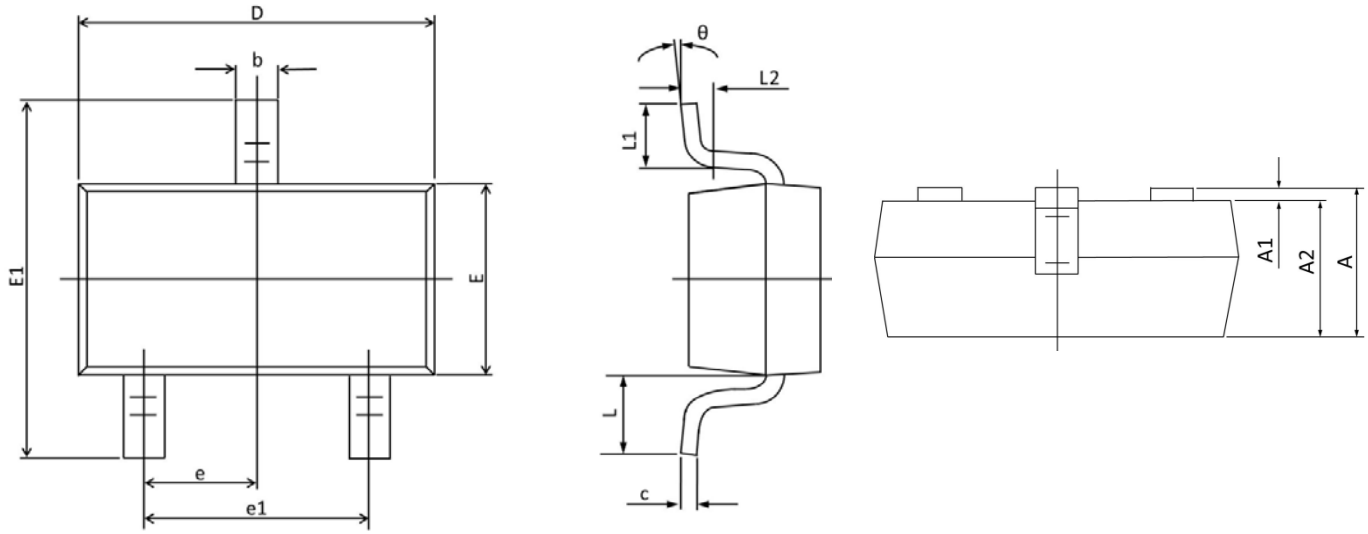


Figure 6. Safe Operation Area

Package Outline Dimensions (SOT-23)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
L2	0.250 TYP.		0.010 TYP.	
θ	0°	8°	0°	8°