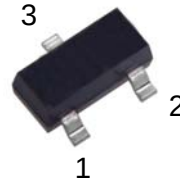


2N7002K

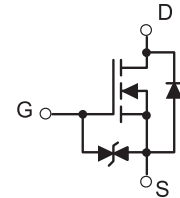
Features:

- Advanced Trench Process Technology
- High Density Cell Design For Ultra Low On-Resistance
- Very Low Leakage Current In Off Condition
- Specially Designed for Battery Operated Systems, Solid-State Relays Drivers: Relay, Displays, Memories, etc
- ESD Protected 2KV HBM
- $R_{DS(ON)}, V_{GS}@10V, I_D@500mA < 2.8\Omega$
- $R_{DS(ON)}, V_{GS}@4.5V, I_D@200mA < 3.6\Omega$

SOT-23



Marking: 7002



1. Gate (G)
2. Source (S)
3. Drain (D)

MOSFET MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNITS
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ^(Note 4)	I_D	300	mA
Pulsed Drain Current ^(Note 1)	I_{DM}	2000	
Power Dissipation	$T_A = 25^\circ\text{C}$	500	mW
	Derate above 25°C	4	mW/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ\text{C}$
Typical Thermal Resistance	$R_{\theta JA}$	250	$^\circ\text{C/W}$
- Junction to Ambient ^(Note 3,4)			

Electrical Characteristics (T_C=25°C unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =10uA	60	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1	1.5	2.5	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =500mA	-	2.1	2.8	Ω
		V _{GS} =4.5V, I _D =200mA	-	2.1	3.6	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±10	
Forward Transconductance	g _{fs}	V _{DS} =15V, I _D =250mA	100	-	-	mS
Dynamic ^(Note 5)						
Total Gate Charge	Q _g	V _{DS} =15V, I _D =250mA, V _{GS} =5V ^(Note 1,2)	-	0.8	-	nC
Gate-Source Charge	Q _{gs}		-	0.35	-	
Gate-Drain Charge	Q _{gd}		-	0.2	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHZ	-	35	-	pF
Output Capacitance	C _{oss}		-	13	-	
Reverse Transfer Capacitance	C _{rss}		-	8	-	
Turn-On Delay Time	t _{d(on)}	V _{DD} =30V, I _D =200mA, V _{GS} =10V, R _G =10Ω ^(Note 1,2)	-	2.7	-	ns
Turn-On Rise Time	t _r		-	19	-	
Turn-Off Delay Time	t _{d(off)}		-	15	-	
Turn-Off Fall Time	t _f		-	23	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I _S	---	-	-	300	mA
Diode Forward Voltage	V _{SD}	I _S =200mA, V _{GS} =0V	-	0.82	1.3	V

NOTES:

1. Pulse width ≤ 300us, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature typical characteristics.
3. R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins mounted on a 1 inch FR-4 with 2oz. square pad of copper.
4. The maximum current rating is package limited.
5. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTIC CURVES

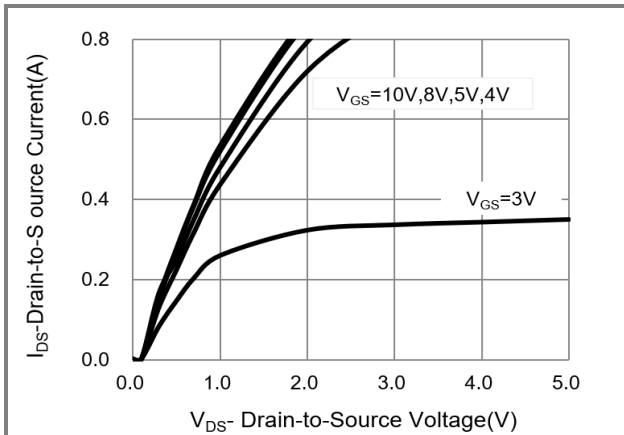


Fig.1 On-Region Characteristics

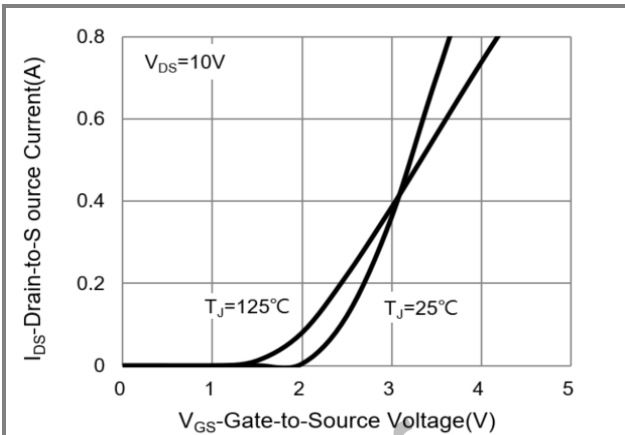


Fig.2 Transfer Characteristics

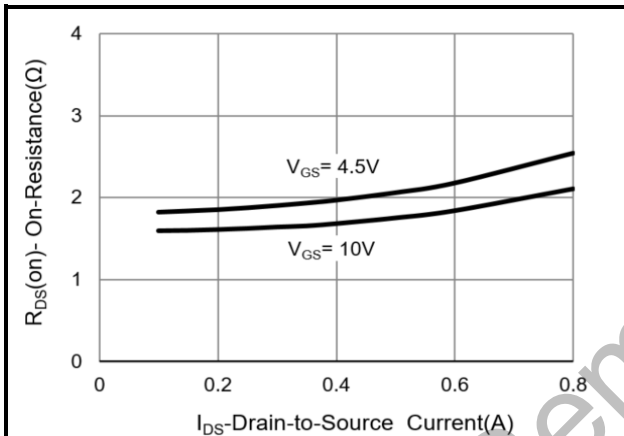


Fig.3 On-Resistance vs. Drain Current

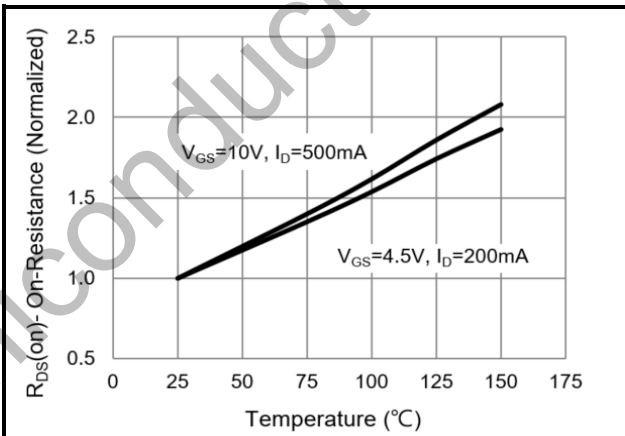


Fig.4 On-Resistance vs. Junction temperature

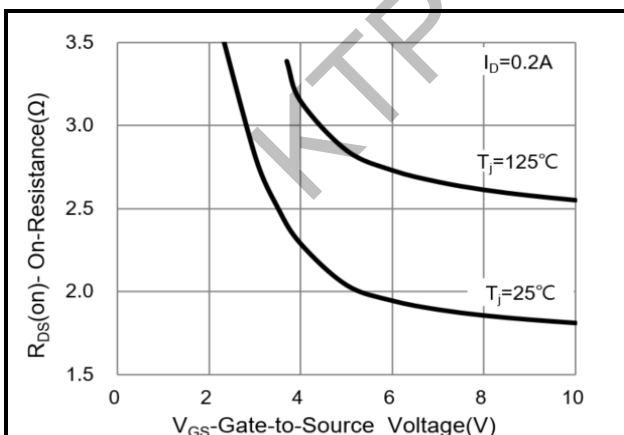
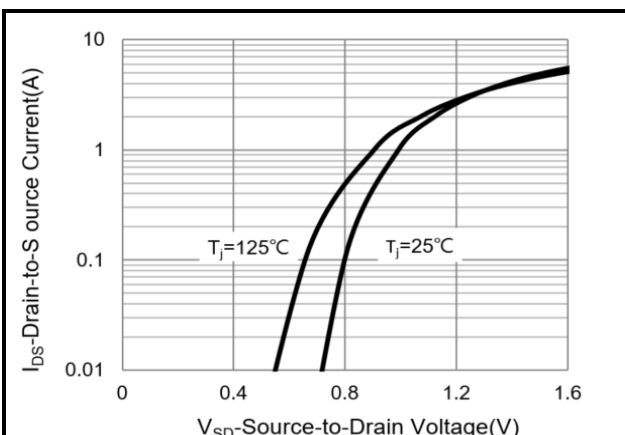
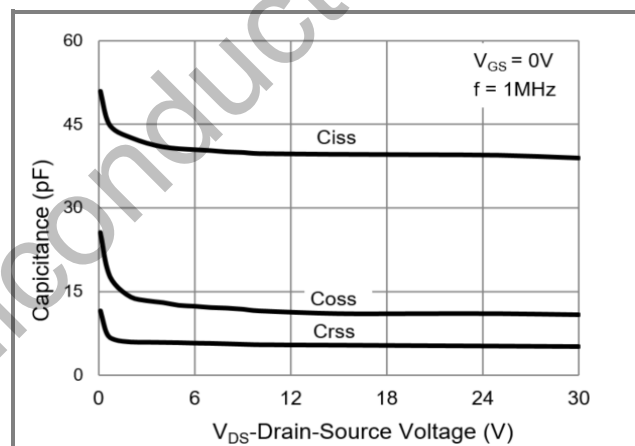
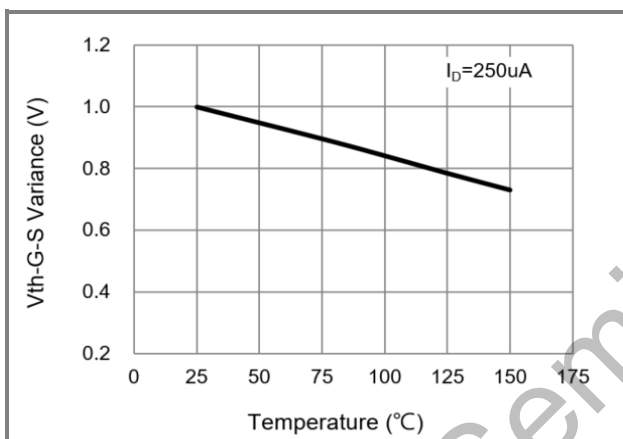
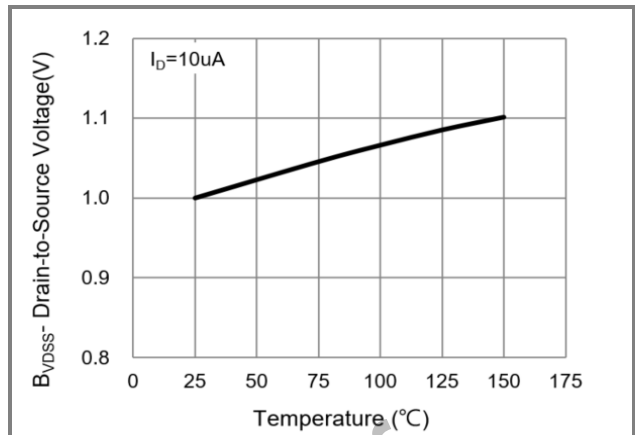
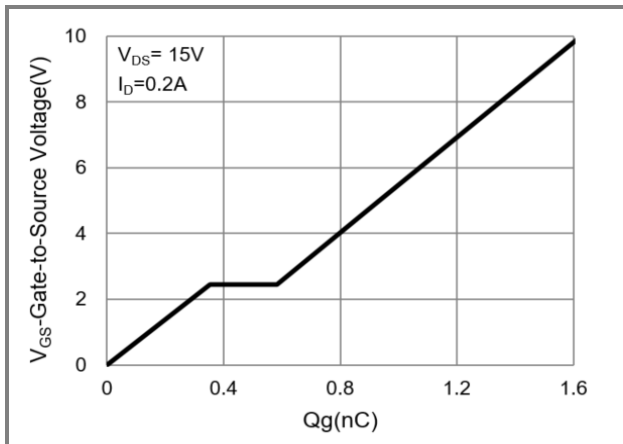
Fig.5 On-Resistance Variation with V_{GS} 

Fig.6 Body Diode Characteristics

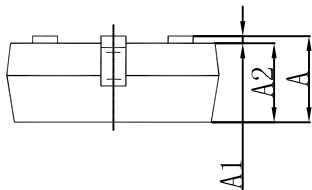
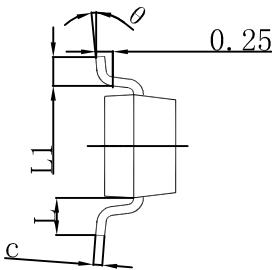
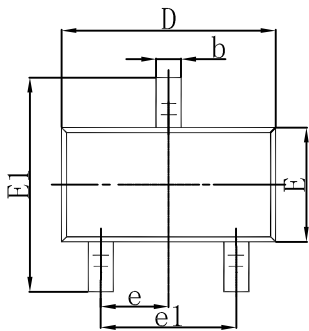
TYPICAL CHARACTERISTIC CURVES



Package Dimension

SOT-23

Unit: mm



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
θ	0°	8°	0°	8°