HUASHUO SEMICONDUCTOR

HSS2N7002K

N-Ch 60V Fast Switching MOSFETs

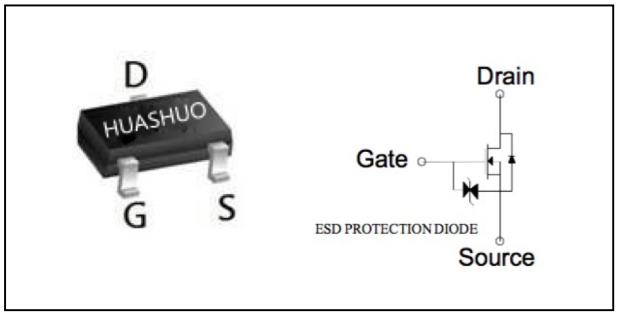
Description

We declare that the material of product compliance with Rohs requirements and Halogen Free.
ESD protected
Low RDS(on)

Product Summary

V_{DS}	60	V
$R_{DS(ON),max}$	2	Ω
I_D	0.3	A

SOT23 Pin Configuration



- Low side load switch
- Level shift circutis
- DC-DC converter
- Portable applications i.e. DSC, PDA, Cell Phone, etc.

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	300	mA
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 10V[1]	190	mA
I_{DM}	Pulsed Drain Current[2]	1	A
P_D@T_A=25°C	Total Power Dissipation[3]	0.35	W
T_{STG}	Storage Temperature Range	-40 to 150	°C
T_J	Operating Junction Temperature Range	-40 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	350	°C/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

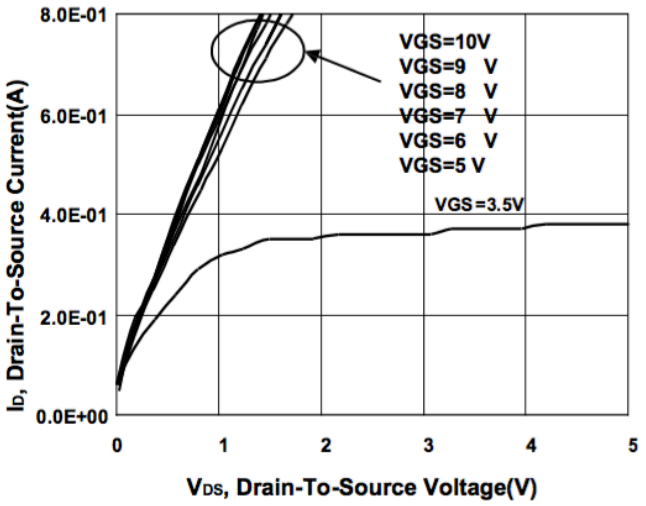
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	60	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.054	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=200mA	---	---	2	Ω
		V_{GS}=4.5V , I_D=100mA	---	---	3	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	---	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.96	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=48V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=48V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±16V , V_{DS}=0V	---	---	±30	uA
gfs	Forward Transconductance	V_{DS}=50V , I_D=200mA	---	0.18	---	S
Q_g	Total Gate Charge (4.5V)	V_{DS}=0.5V , V_{GS}=10V , I_D=200mA	---	1.0	---	nC
Q_{gs}	Gate-Source Charge		---	0.4	---	
Q_{gd}	Gate-Drain Charge		---	1	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=30V , V_{GEN}=10V , R_G=25Ω, I_D=500mA, RL=60Ω,	---	2.7	---	ns
T_r	Rise Time		---	2.5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	13	---	
T_f	Fall Time		---	8	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	38	---	pF
C_{oss}	Output Capacitance		---	5	---	
C_{rss}	Reverse Transfer Capacitance		---	2	---	

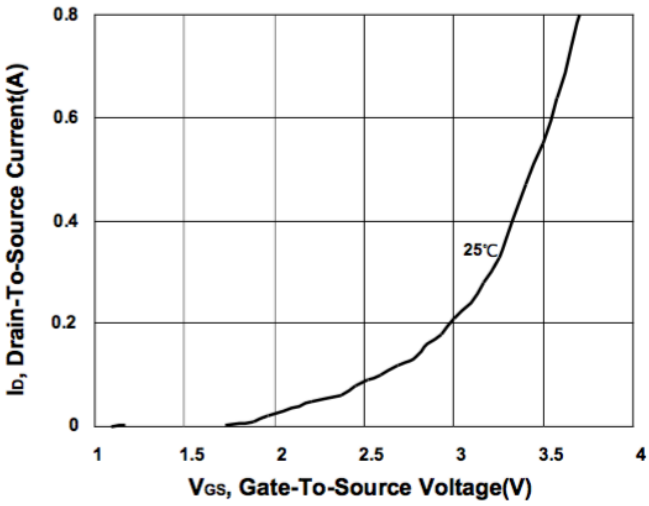
Diode Characteristics

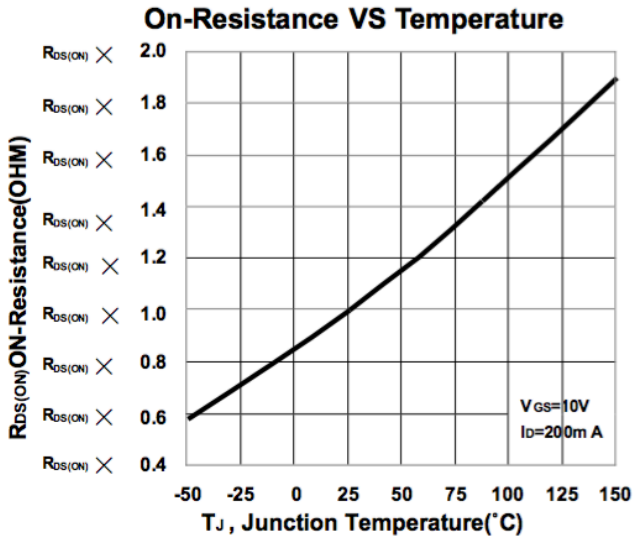
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	300	mA
I_{SM}	Pulsed Source Current[2,4]		---	---	1	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=0.5A , T_J=25℃	---	---	0.85	V

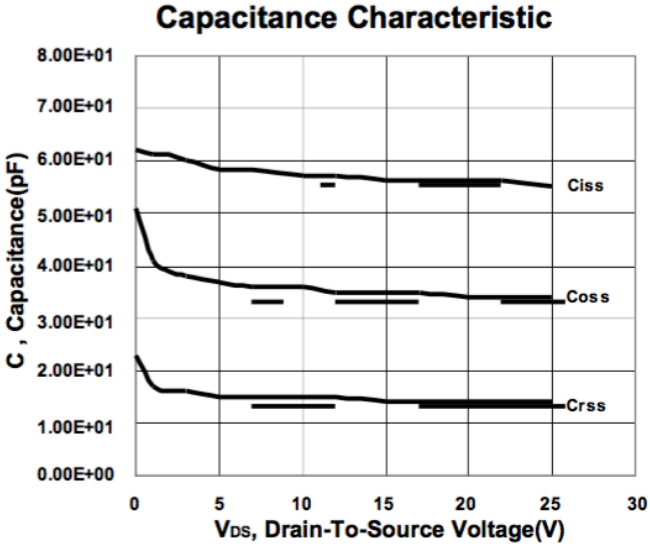
Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The power dissipation is limited by 150℃ junction temperature.
4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

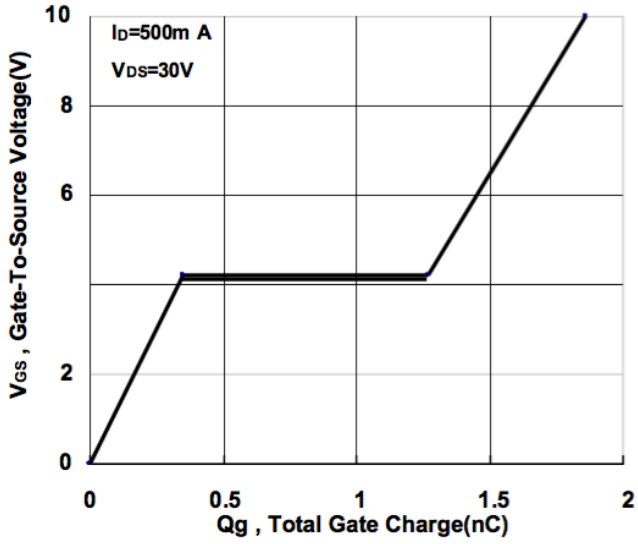
Typical Characteristics

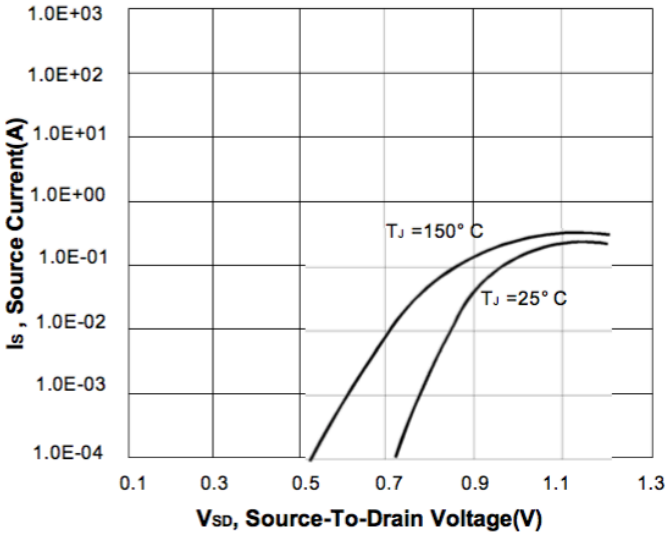


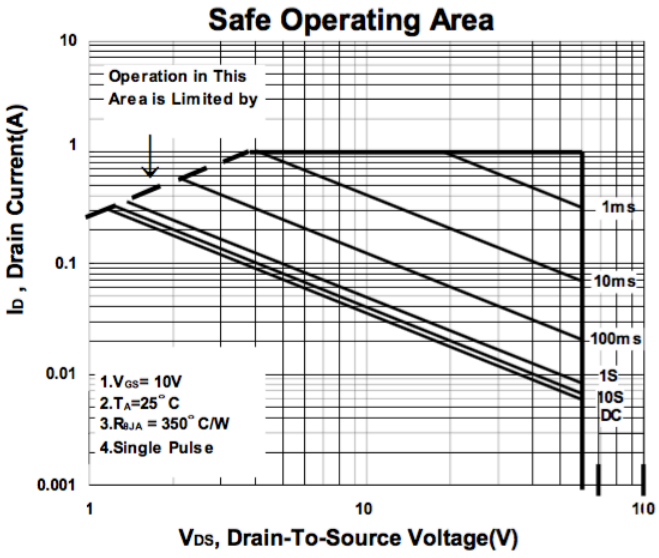


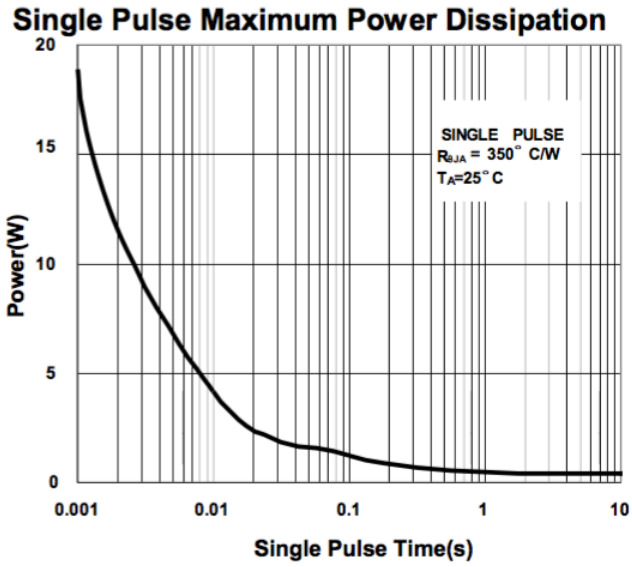


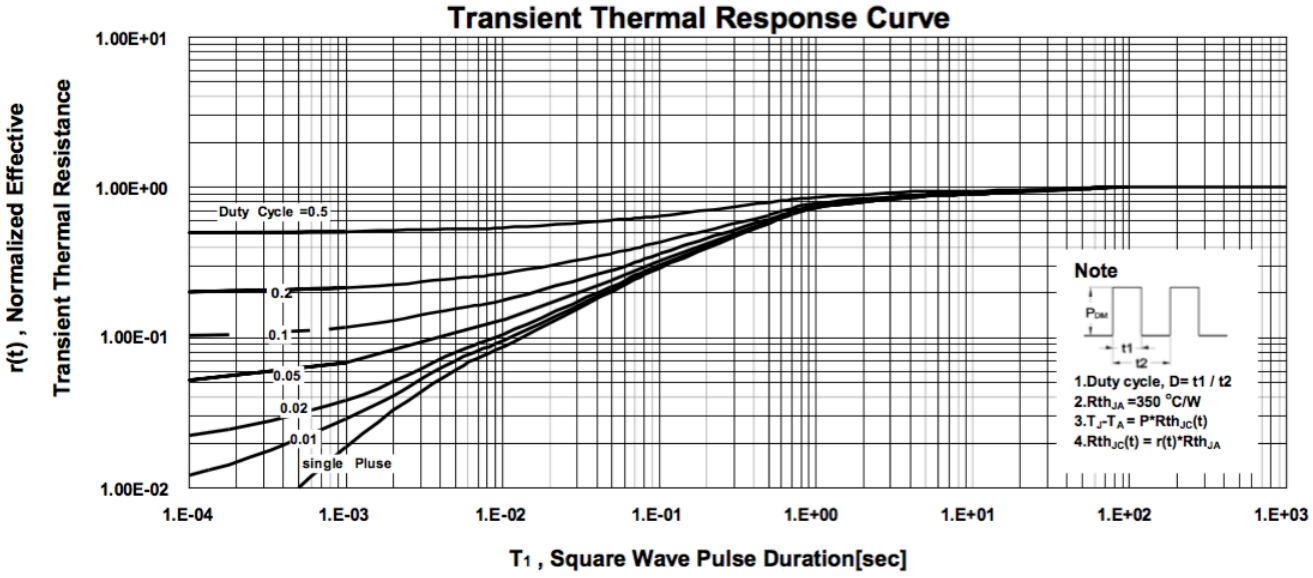






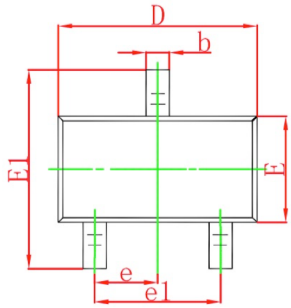

Safe Operating Area
Operation in This
Area is Limited by
1ms
10ms
100ms
1S
10S
DC
1.VGS= 10V
2.TA=25° C
3.RθJA = 350° C/W
4.Single Pulse
ID , Drain Current(A)
VDS, Drain-To-Source Voltage(V)

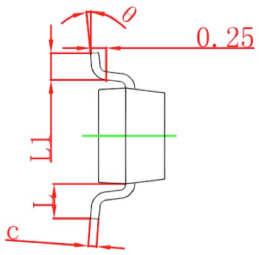

Single Pulse Maximum Power Dissipation
SINGLE PULSE
RθJA = 350° C/W
TA=25° C
Power(W)
Single Pulse Time(s)

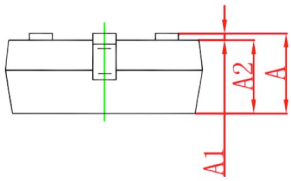

Transient Thermal Response Curve
Duty Cycle =0.5
0.2
0.1
0.05
0.02
0.01
single Pluse
Note
1.Duty cycle, D= t1 / t2
2.RthJA =350 °C/W
3.TJ-TA = P*RthJC(t)
4.RthJC(t) = r(t)*RthJA
r(t) , Normalized Effective Transient Thermal Resistance
T1 , Square Wave Pulse Duration[sec]

Ordering Information

Part Number	Package code	Packaging
HSS2N7002K	SOT-23	3000/Tape&Reel







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°