YK2N7002K

N-Channel Enhancement Mode MOSFET

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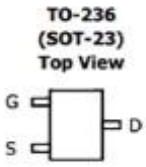
HORNBY ELECTRONIC

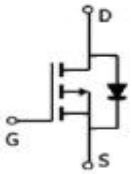
Application

- ●Direct logic-level interface: TTL/CMOS
- ●Drivers: relays, solenoids, lamps, hammers,display, memories, transistors, etc.
- ●Battery operated systems
- ●Solid-state relays

General Description

- VDS = 60V,ID = 0.3A
  RDS(ON) < 3Ω @ VGS=5V
  RDS(ON) < 2.5Ω @ VGS=10V
- ESD Rating: HBM 2000V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package





Package and Ordering Information

Device	Device Package	Reel Size	Tape width	Quantity
7002K	SOT-23	Ø180mm	8mm	3000 units

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	VDS	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current	I_D	0.3	A
Maximum Power Dissipation	P_D	0.35	W
Operating Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 To 150	℃

Thermal Characteristics

Thermal Resistance,Junction-to-Ambient[Note2]	$R_{\theta JA}$	416	°C/W

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D =250μA	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =60V, V_{GS} = 0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V,V_{DS} =0V	-	-	±10	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250μA	1	1.5	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_{DS}=0.2A	-	2	3	Ω
		V_{GS}=10V, I_{DS}=0.3A	-	1.8	2.5	
Dynamic Characteristics						
Input Capacitance	C_{iss}	VDS=30V,VGS=0V,f=1MHZ	-	23	-	pF
Output Capacitance	C_{oss}		-	11	-	
Reverse Transfer Capacitance	C_{rss}		-	5	-	
Switching Characteristics (Note 4)						
Turn-on Delay Time	$T_{d(on)}$	VGS=10V,VDD=50V, ID=200mA, RGEN=50Ω	-	7		ns
Turn-on Rise Time	T_r		-	19		
Turn-Off Delay Time	$T_{d(OFF)}$		-	20		
Turn-Off Fall Time	T_f		-	84		
Total Gate Charge	Q_g	VDS=10V,ID=0.3A,VGS=4.5V	-	1.22	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V I_S=0.2A Tj = 25°C	-	-	1.3	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

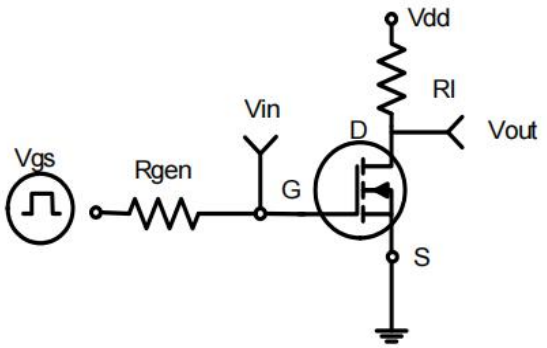


Figure 1:Switching Test Circuit

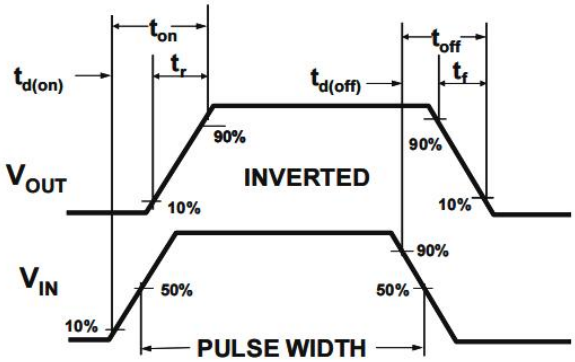


Figure 2:Switching Waveforms

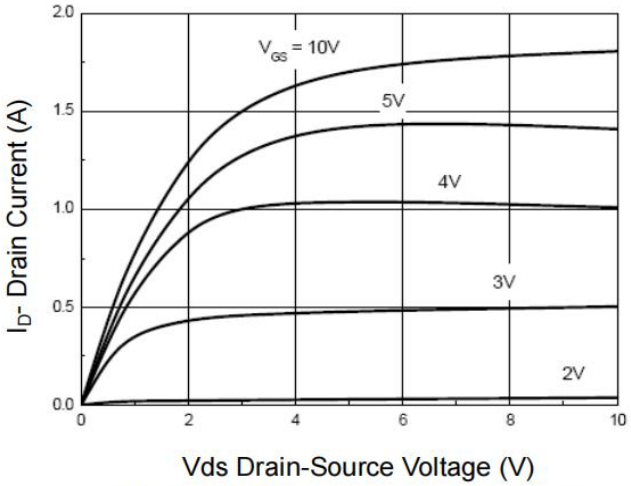


Figure 3 Output Characteristics

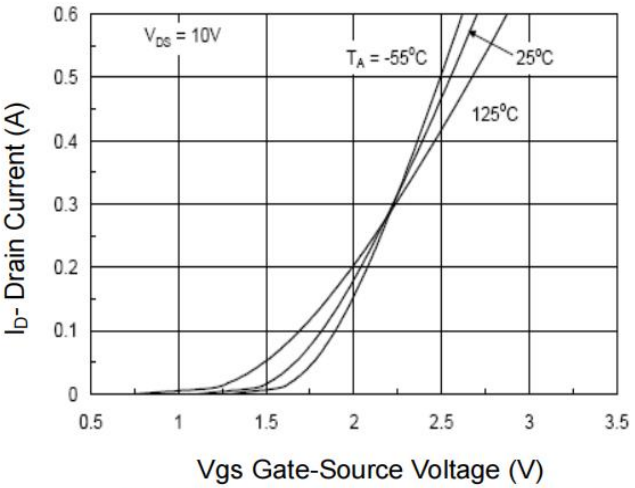


Figure 4 Transfer Characteristics

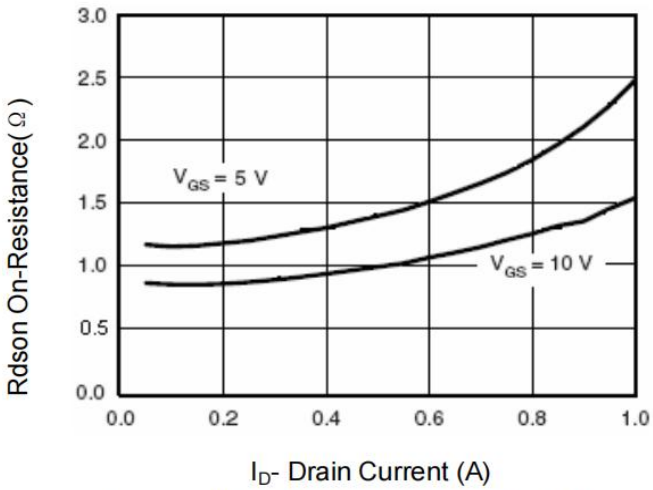


Figure 5 Drain-Source On-Resistance

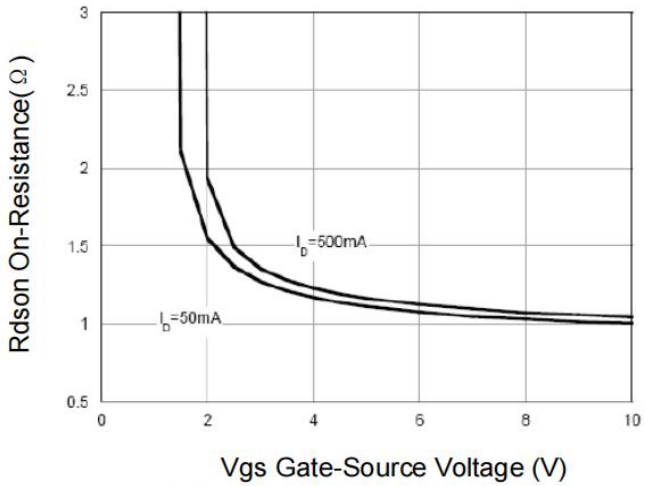


Figure 6 Rdson vs Vgs

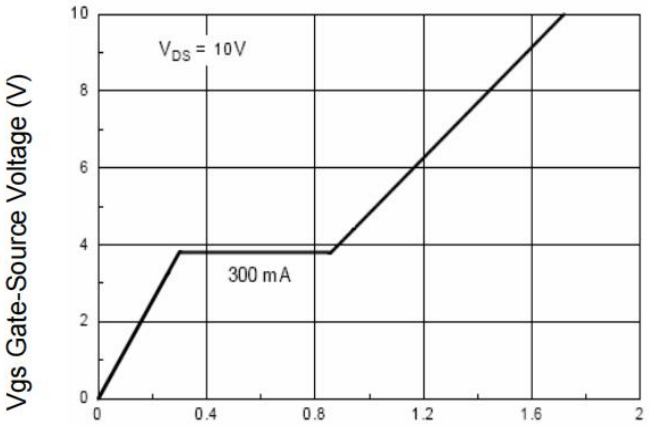


Figure 7 Gate Charge

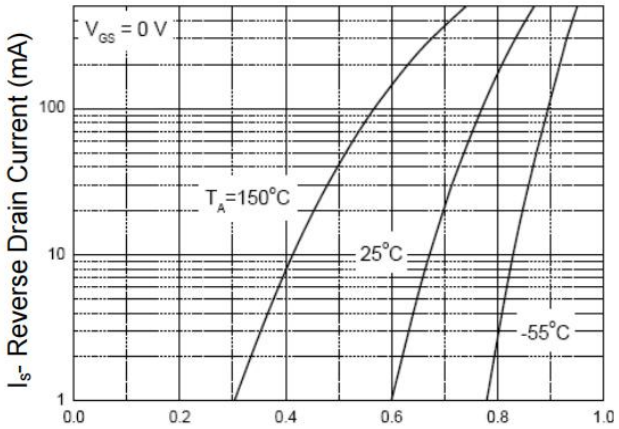


Figure 8 Source-DrainDiode Forward

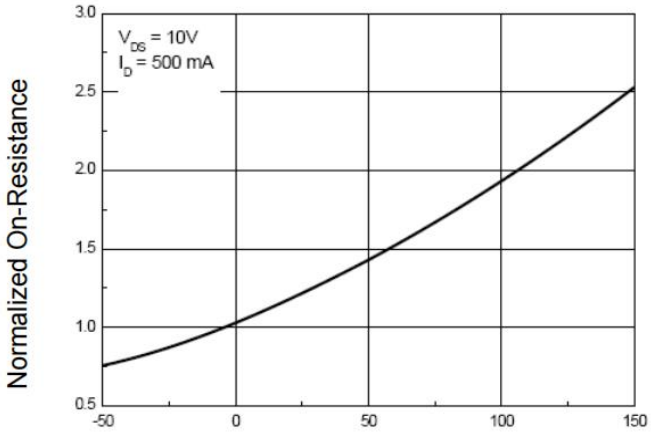


Figure 9 Drain-Source On-Resistance

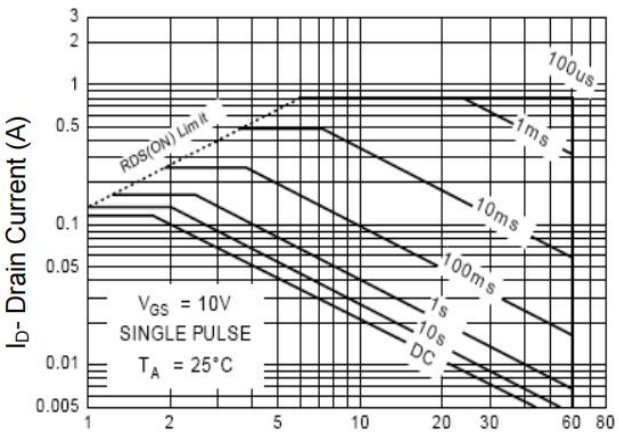


Figure 10 Safe Operation Area

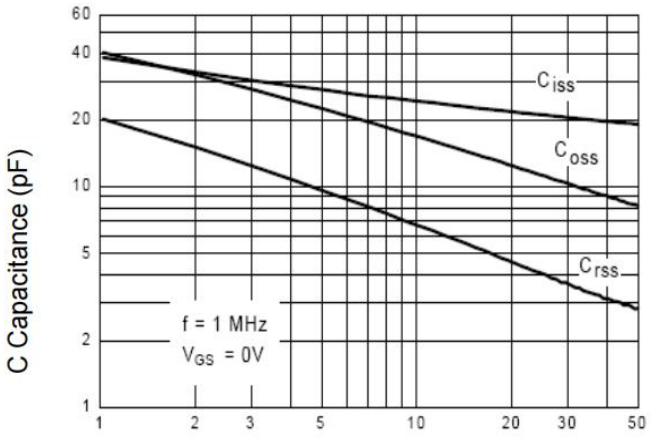


Figure 11 Capacitance vs Vds

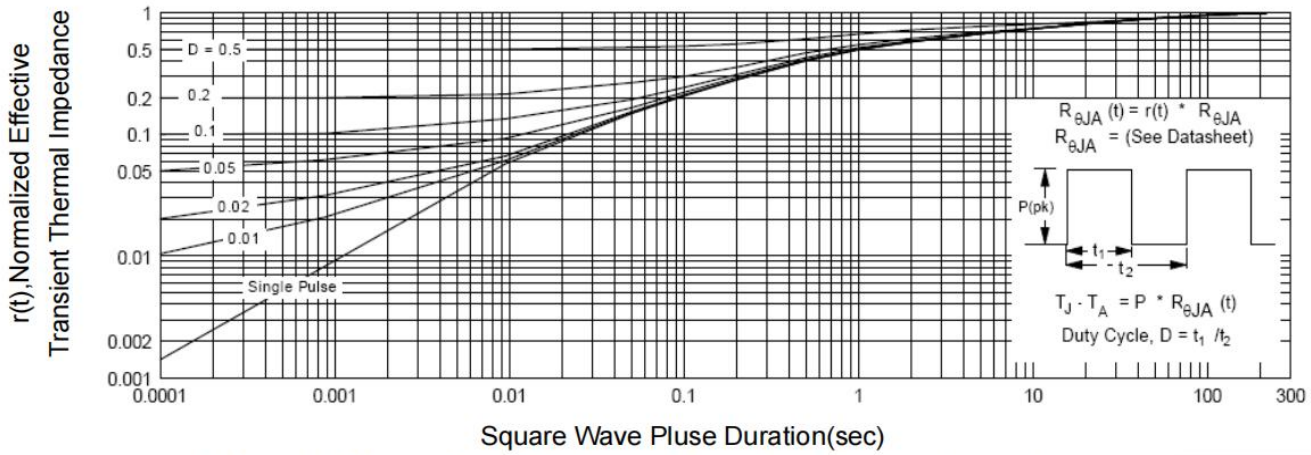
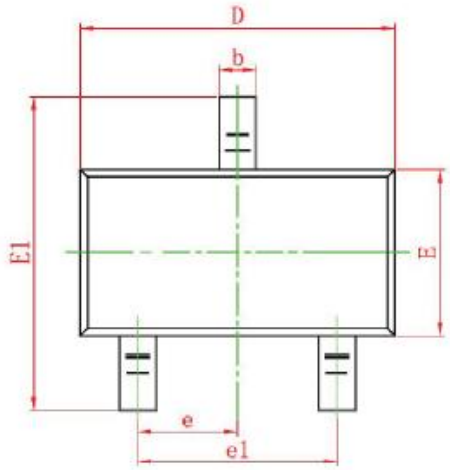
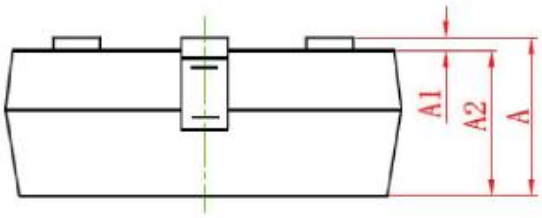
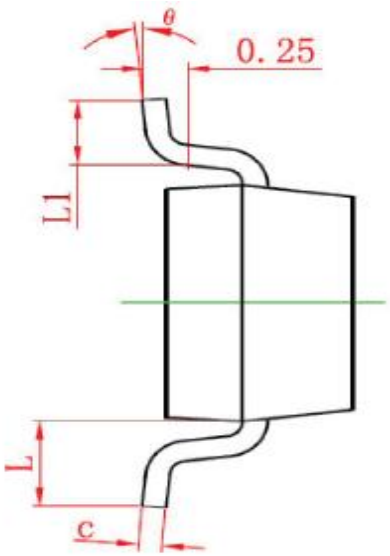


Figure 12 Normalized Maximum Transient Thermal Impedance

SOT-23 Package Information







Symbol	Dimensions in Millimeters	
	MIN	MAX
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
C	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950 TYP	
e1	1.800	2.000
L	0.550 REF	
L1	0.300	0.500
θ	0°	8°