N-Channel Enhancement Mode MOSFET

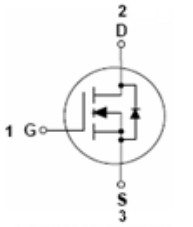
康 比 電 子 HORNBY ELECTRONIC

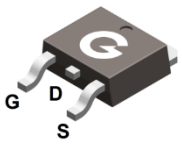
YK2N20D

Features

HF

- Advanced Trench technology
- Low gate drive voltage (Logic level capable)
- Low input capacitance
- Low on-resistance
- Fast switching speed
- RoHS compliant with Halogen-free





TO-252

Mechanical Data

- Case: TO-252
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
YK2N20D	TO-252	80 pcs / Tube or 2500 pcs / Tape & Reel	2N20D

Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	200	V
Gate-to-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current(T_C = 25°C)	I_D	5	A
Continuous Drain Current(T_A = 25°C) *1		1.6	A
Pulsed Drain Current (t_p =10μs, T_C = 25°C)	I_{DM}	20	A
Single Pulse Avalanche Energy *3	E_{AS}	1	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T_C = 25°C)	P_D	30	W
Thermal Resistance Junction-to-Csae	$R_{\theta JC}$	4.2	°C/W
Thermal Resistance Junction-to-Air *1	$R_{\theta JA}$	40.3	°C/W
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

YK2N20D

Electrical Characteristics (@ T_A = 25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	200	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 200V, V_{GS} = 0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
On Characteristics						
$R_{DS(ON)}$	Drain-Source On-resistance *2	V_{GS} = 10V, I_D = 2A	-	0.65	0.75	Ω
		V_{GS} = 5V, I_D = 2A	-	0.67	0.78	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1	1.6	2.5	V
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz	-	580	-	pF
C_{OSS}	Output Capacitance		-	90	-	
C_{RSS}	Reverse Transfer Capacitance		-	3	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time *4	V_{DD} = 100V V_{GS} = 10V R_G = 2.5Ω R_L = 15Ω	-	10	-	ns
t_r	Turn-on Rise Time *4		-	12	-	
$t_{d(OFF)}$	Turn-Off Delay Time *4		-	15	-	
t_f	Turn-Off Fall Time *4		-	15	-	
Q_G	Total Gate-Charge	V_{DD} = 100V V_{GS} = 10V I_D = 2A	-	12	-	nC
Q_{GS}	Gate to Source Charge		-	2.5	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	3.8	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *2	I_{SD} = 2A, V_{GS} = 0V	-	0.86	0.95	V
trr	Reverse recovery time	I_S = 2A, V_{GS} = 0V, di/dt = 100A/μs	-	177	-	ns
Qrr	Reverse recovery charge		-	1.4	-	μC

Notes:

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 ≤ 300μs, duty cycle ≤ 2%
3. The E_{AS} data shows Max. rating. The test condition is V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH
4. Guaranteed by design, not subject to production

YK2N20D

Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

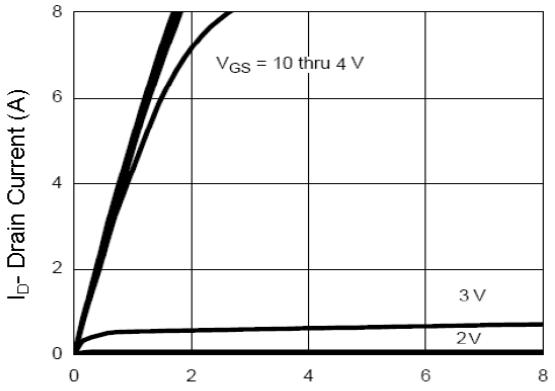


Figure 1 Output Characteristics

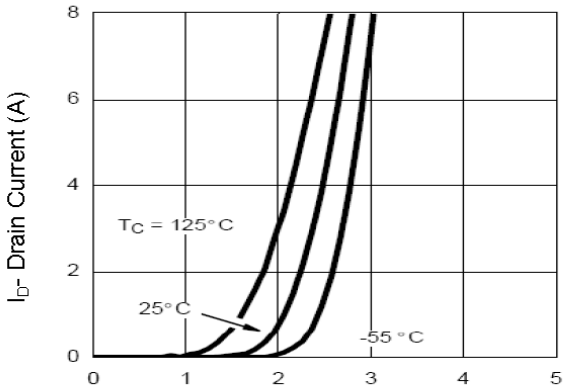


Figure 2 Transfer Characteristics

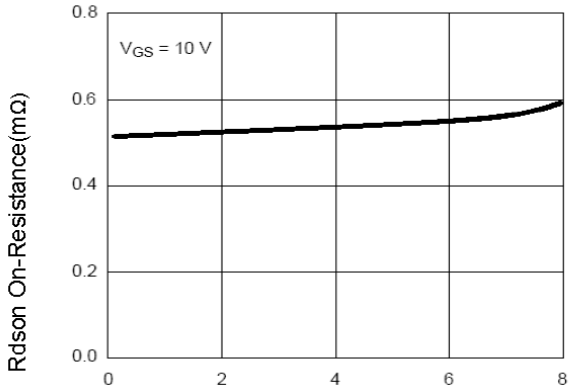


Figure 3 Rdson- Drain Current

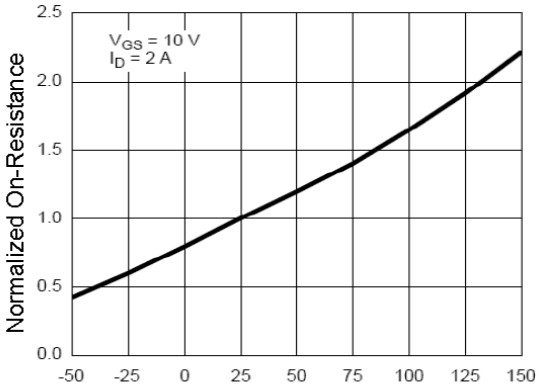


Figure 4 Rdson-JunctionTemperature

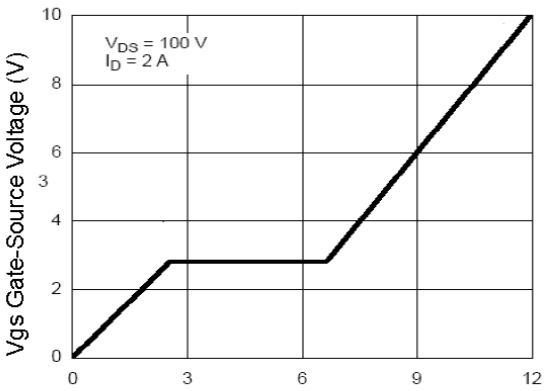


Figure 5 Gate Charge

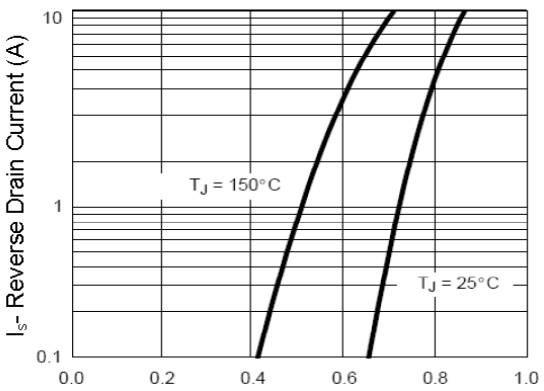


Figure 6 Source- Drain Diode Forward

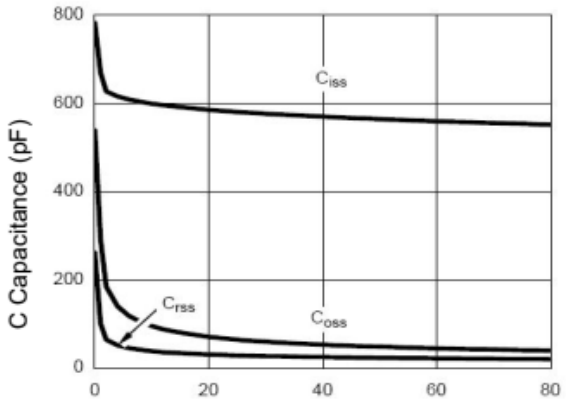


Figure 7 Capacitance vs Vds

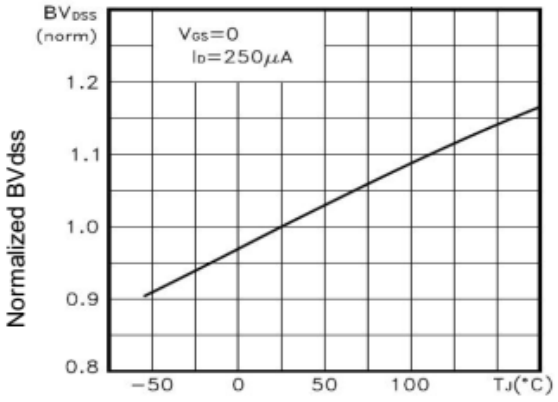


Figure 8 BV_{DSS} vs Junction Temperature

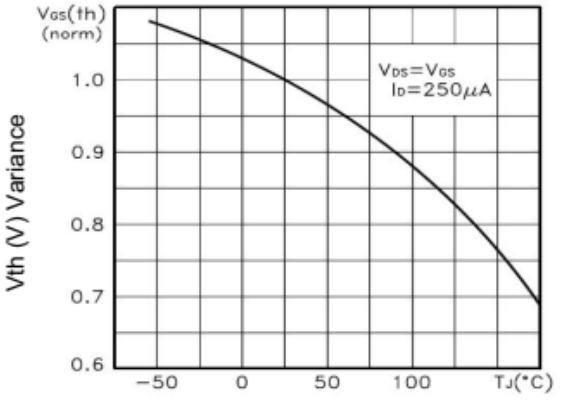
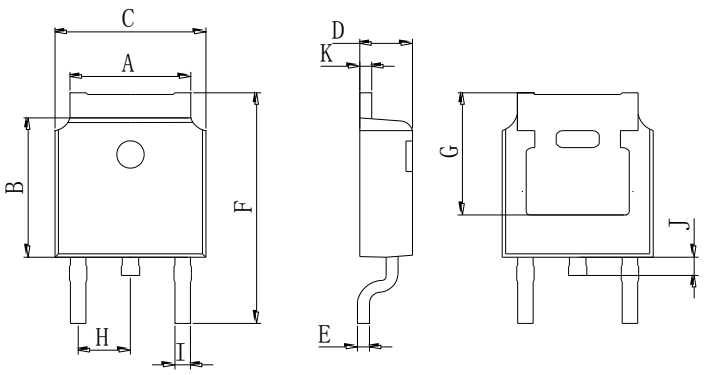


Figure 9 $V_{GS(th)}$ vs Junction Temperature

YK2N20D

Package Outline Dimensions (Unit: mm)



TO-252		
Dimension	**Min.**	**Max.**
A	5.05	5.65
B	5.80	6.40
C	6.25	6.85
D	2.20	2.40
E	0.40	0.60
F	9.71	10.31
G	5.05	5.65
H	2.10	2.50
I	0.70	0.90
J	0.50	0.70
K	0.40	0.60

Mounting Pad Layout (Unit: mm)

TO-252