

YK3080K



康比電子
HORNBY ELECTRONIC

N-Channel Enhancement Mode Field Effect Transistor

General Description

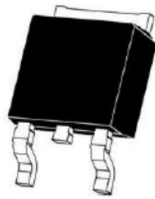
The YK3080K uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Application

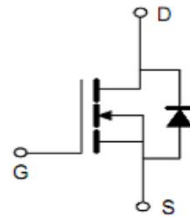
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Features

- $V_{DS} = 30V, I_D = 80A$
 $R_{DS(ON)} < 6m\Omega @ V_{GS} = 10V$
 $R_{DS(ON)} < 9m\Omega @ V_{GS} = 4.5V$
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation



TO-252-2L top view



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Reel	Carton
3080K	YK3080K	TO-252-2L	13inch	2500pcs	50000PCS

Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current-Continuous @ $T_C = 25^\circ C$	I_D	80	A
Pulsed Drain Current	I_{DM}	170	A
Maximum Power Dissipation @ $T_C = 25^\circ C$	P_D	58	W
Single pulse avalanche energy (Note 5)	EAS	196	mJ
Operating Junction and Storage Temperature Range	T_J	-55 ~ +150	$^\circ C$

Thermal Characteristics

Thermal Resistance Junction-to-Case (Note 2)	$R_{\theta JC}$	2.2	$^\circ C/W$
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Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	30		-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1	1.6	3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D =30A	-	4.5	6	mΩ
		V _{GS} =4.5V, I _D = 24A	-	6.8	9	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =24A	20	-	-	S
Dynamic Characteristics ^(Note4)						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, F=1MHz	-	1720	-	pF
Output Capacitance	C _{oss}		-	235	-	
Reverse Transfer Capacitance	C _{rss}		-	218	-	
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	T _{d(on)}	V _{DD} =15V, I _D =30A, V _{GS} =10V, R _G =3Ω	-	7.5	-	ns
Turn-on Rise Time	T _r		-	14.5	-	
Turn-Off Delay Time	T _{d(OFF)}		-	33	-	
Turn-Off Fall Time	T _f		-	10.3	-	
Total Gate Charge	Q _g	V _{DS} =15V, I _D =30A, V _{GS} =10V	-	33.7	-	nC
Gate-Source Charge	Q _{gs}		-	8.5	-	
Gate-Drain Charge	Q _{gd}		-	7.5	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	I _S =30A, V _{GS} =0V	-	-	1.2	V
Diode Forward Current ^(Note 2)	I _S		-	-	80	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS condition: $T_j=25^{\circ}\text{C}, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25\Omega, I_{AS}=35A$

Typical Electrical and Thermal Characteristics

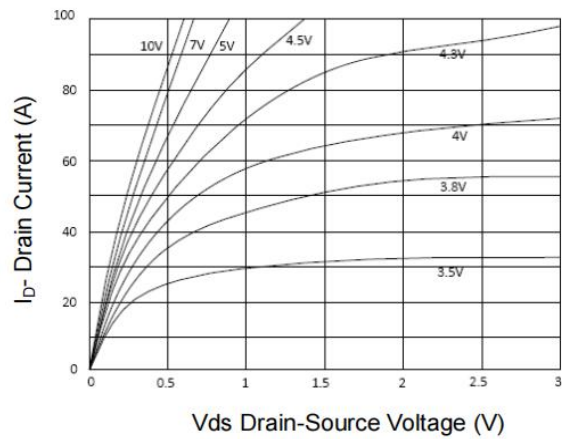


Figure 1 Output Characteristics

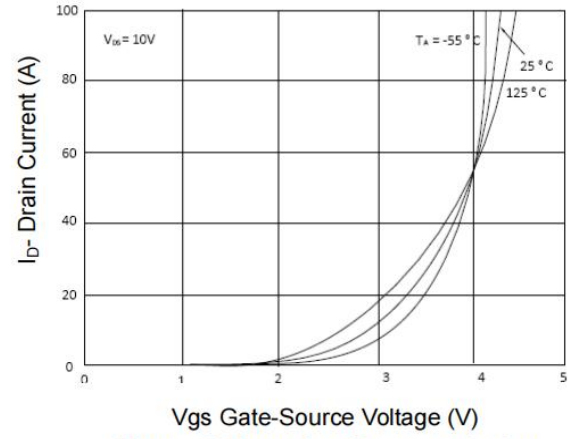


Figure 2 Transfer Characteristics

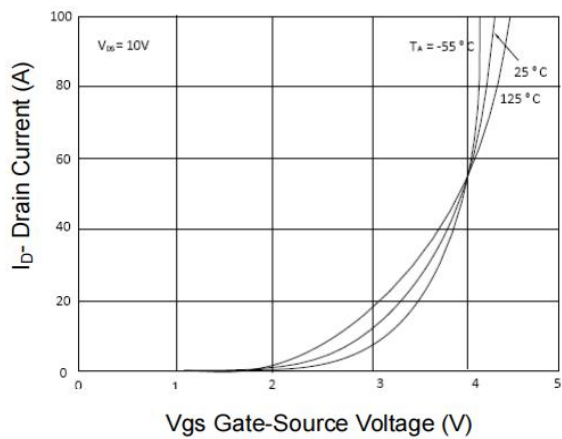


Figure 2 Transfer Characteristics

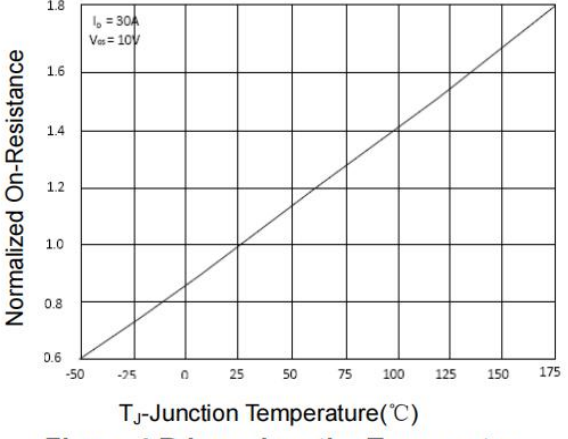


Figure 4 Rdson-Junction Temperature

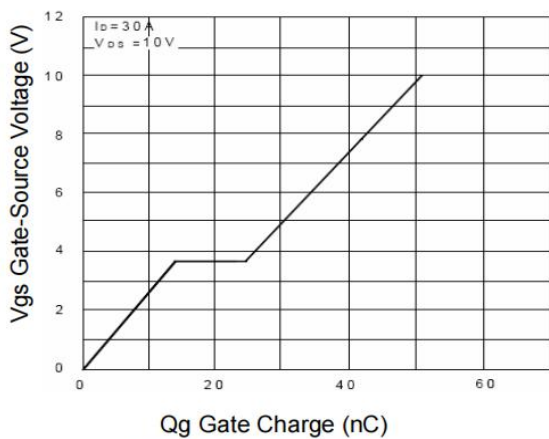


Figure 5 Gate Charge

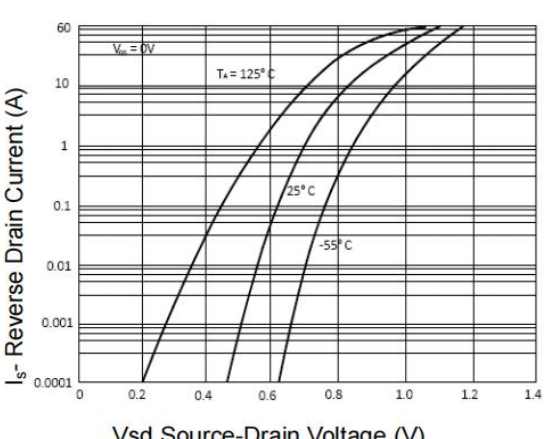


Figure 6 Source- Drain Diode Forward

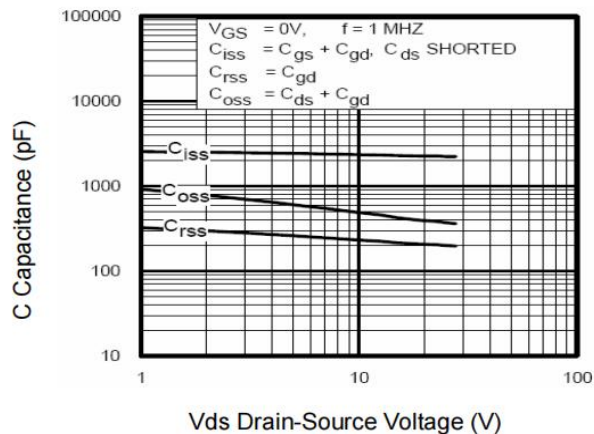


Figure 7 Capacitance vs Vds

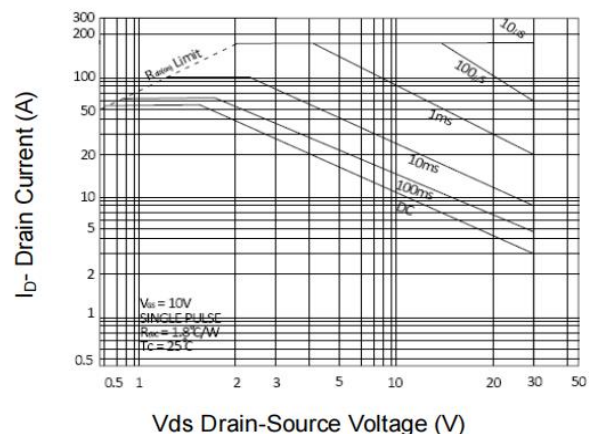


Figure 8 Safe Operation Area

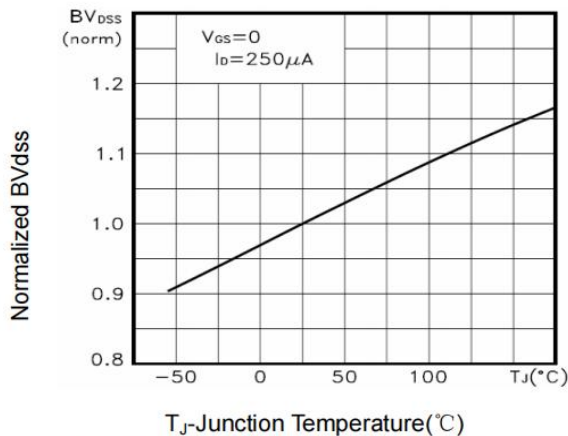
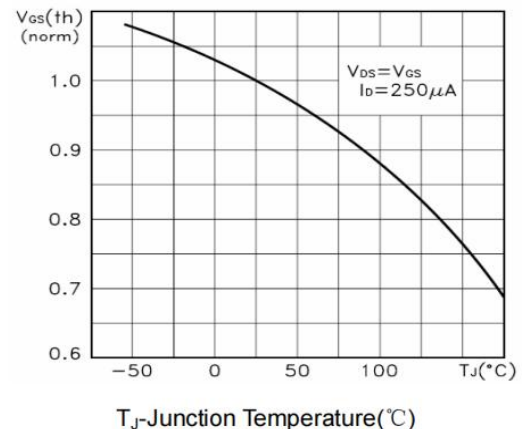
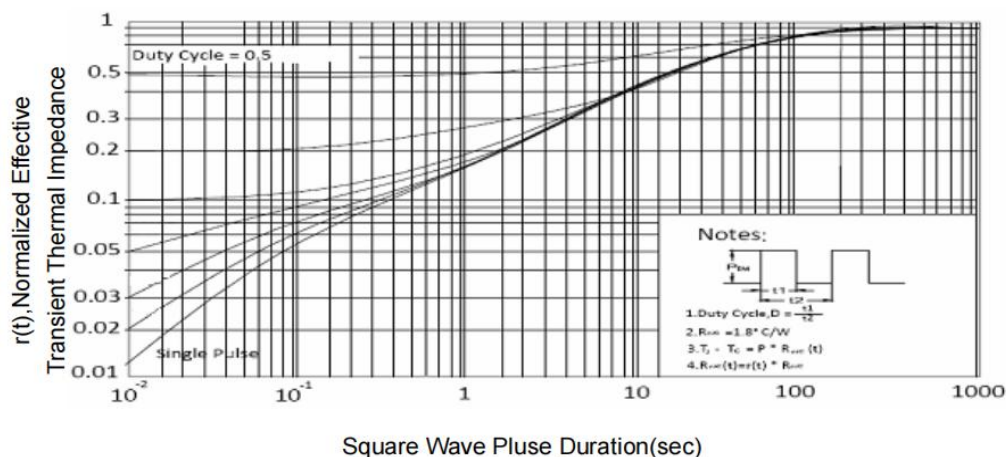
Figure 9 BV_{DSS} vs Junction TemperatureFigure 10 $V_{GS(th)}$ vs Junction Temperature

Figure 11 Normalized Maximum Transient Thermal Impedance

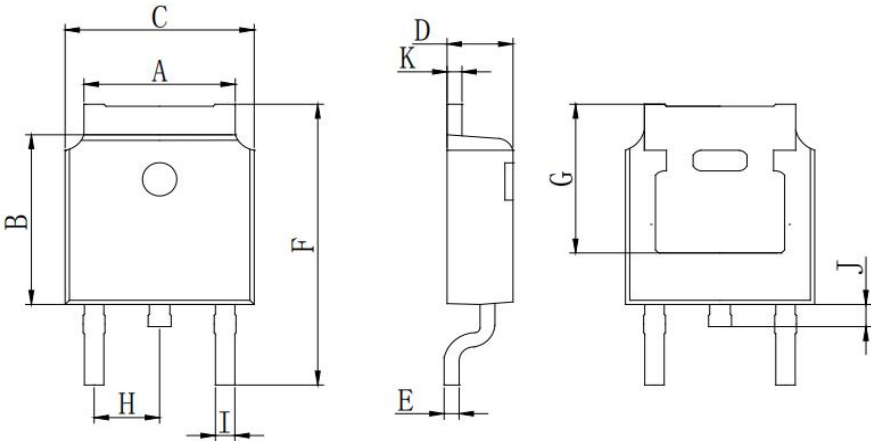
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TO-252 Package Information



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	0.7	0.9
J	0.5	0.8
K	0.4	0.6