KJ3080K

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

- Advanced trench technology
- Excellent $R_{DS(ON)}$
- Low gate charge

Applications

- PWM applications
- Load switch
- Power management

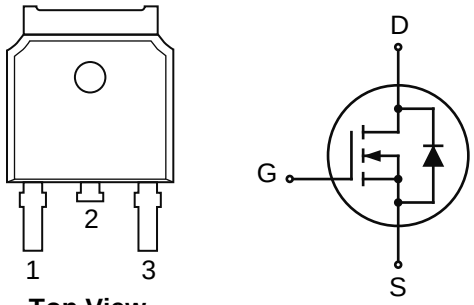
Quick reference

- V_{DS} = 30 V
- I_D = 86 A
- $R_{DS(ON)} \leqq$ 5 mΩ @ V_{GS} = 10 V (Type: 3.8 mΩ)
- $R_{DS(ON)} \leqq$ 9.5 mΩ @ V_{GS} = 4.5 V (Type: 6 mΩ)

Pin Description

Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

Simplified Outline	Symbol



Top View
TO-252

Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape width	Quantity
KJ3080K	**TO-252**	**3080K**	**325mm**	**16mm**	**2500**

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

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	30	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current (T_C= 25℃) [a]	T_C = 25°C	I_D	86	A
	T_C = 100°C		60	
Pulsed drain current [b]		I_{DM}	344	
Maximum Power dissipation	T_C = 25°C	P_D	83	W
	T_C = 100°C		42	
Avalanche energy [c]		E_{AS}	270	mJ
Operating junction and storage temperature range		T_J, T_{stg}	-55~175	°C

3. Electrical Characteristics (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V			1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1	1.5	2.5	V
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=15A		24		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=20A		3.8	5	mΩ
		V_{GS}=4.5V, I_D=20A		6	9.5	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1.0MHz		1980		pF
C_{oss}	Output Capacitance			320		pF
C_{rss}	Reverse Transfer Capacitance			240		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V f=1.0MHz		3.2		Ω
Switching Times						
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=10V, V_{DS}=15V, R_L=0.75Ω, R_{GEN}=3Ω		12		ns
t_r	Turn-on Rise Time			36		ns
$t_{d(off)}$	Turn-Off Delay Time			49		ns
t_f	Turn-Off Fall Time			12		ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=25V, I_D=14A		45		nC
Q_{gs}	Gate-Source Charge			3		
Q_{gd}	Gate-Drain Charge			15		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current(Body Diode)				86	A
V_{SD}	Forward on Voltage	V_{GS}=0V, I_S=20A			1.2	V
t_{rr}	Body Diode Reverse Recovery Time	I_F=20A, dI/dt=100A/μs		15		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=20A, dI/dt=100A/μs		4		nC

Notes:

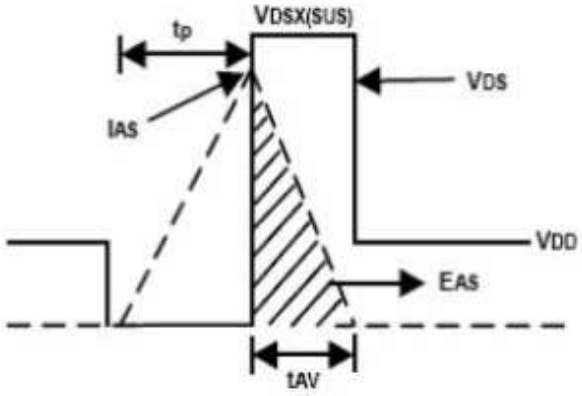
a: The maximum current rating is package limited.

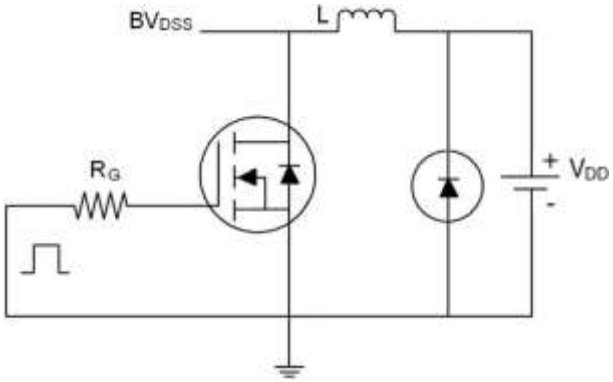
b: Repetitive Rating: Pulse width limited by maximum junction temperature.

c: E_{AS} condition: T_J=25℃,V_{DD}=30V, V_G=10V, R_G=25Ω.

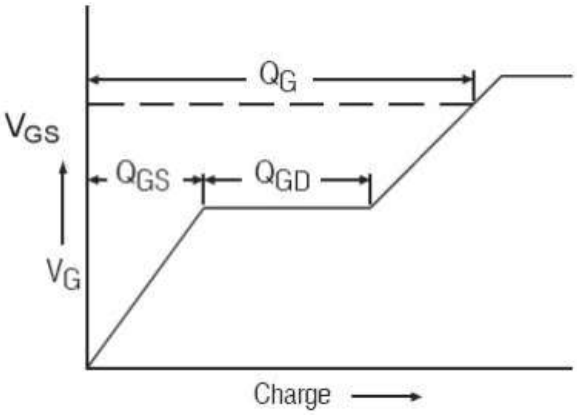
3. Test Circuit

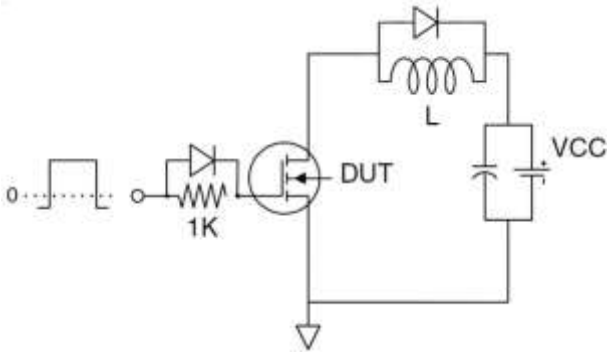
EAS Test Circuits



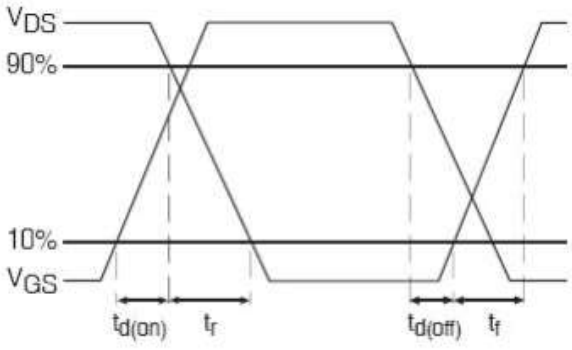


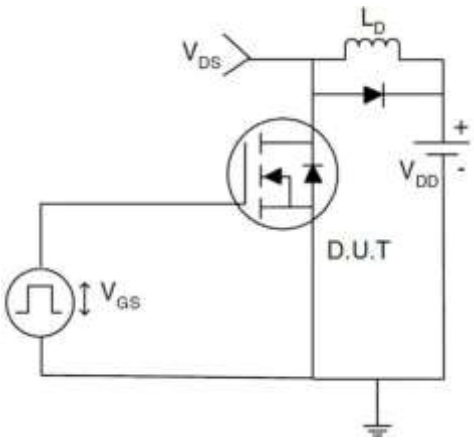
Gate Charge Test Circuit:





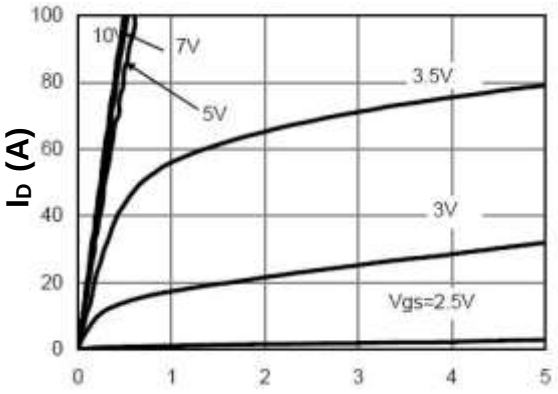
Switch Time Test Circuit：





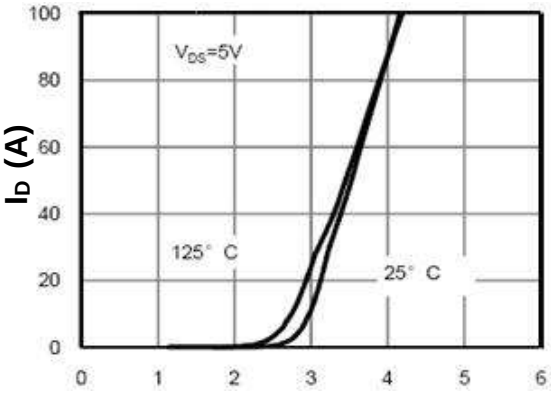
4. Typical Electrical Characteristics and Thermal Characteristics (Curves)

Figure 1. Output Characteristics



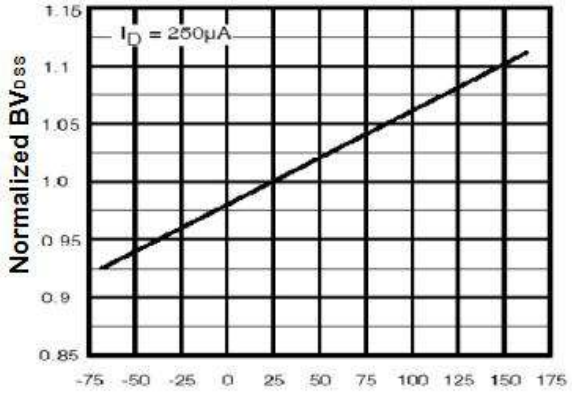
V_{DS}-Drain-to-Source Voltage(V)

Figure 2. Transfer Characteristics



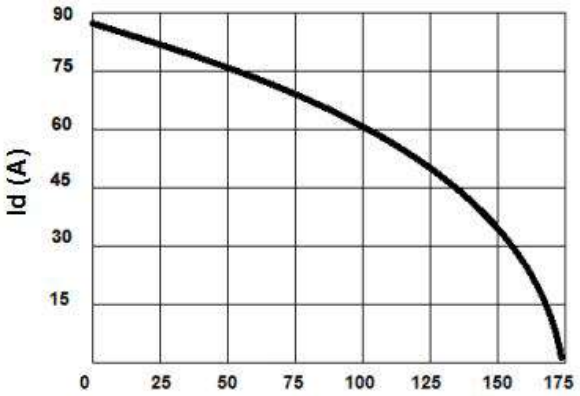
V_{GS}-Gate-to-Source Voltage(V)

Figure 3. Max BV_{DSS} vs Junction Temperature



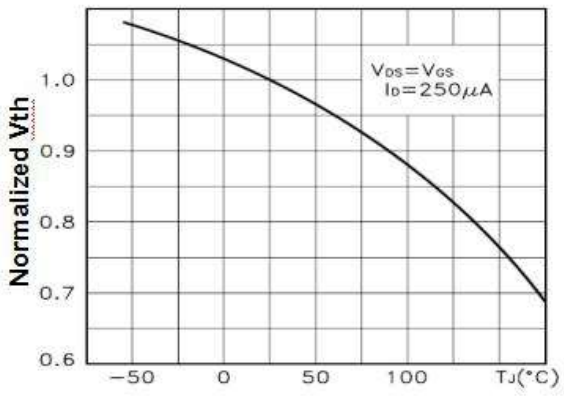
TJ-Junction Temperature(℃)

Figure 4. Drain Current



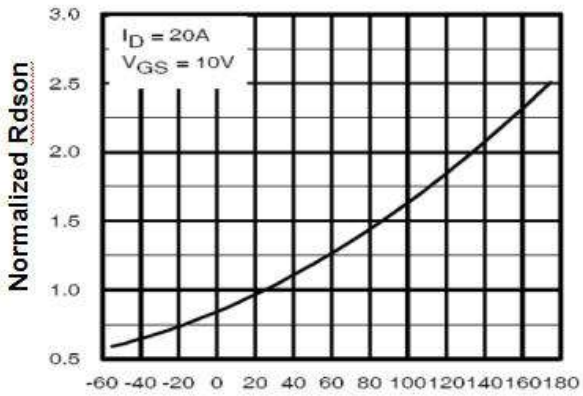
TJ-Junction Temperature(℃)

Figure 5. $V_{GS(th)}$ vs Junction Temperature



TJ-Junction Temperature(℃)

Figure 6. $R_{DS(ON)}$ vs Junction Temperature



TJ-Junction Temperature(℃)

Figure 7. Gate Charge Waveforms

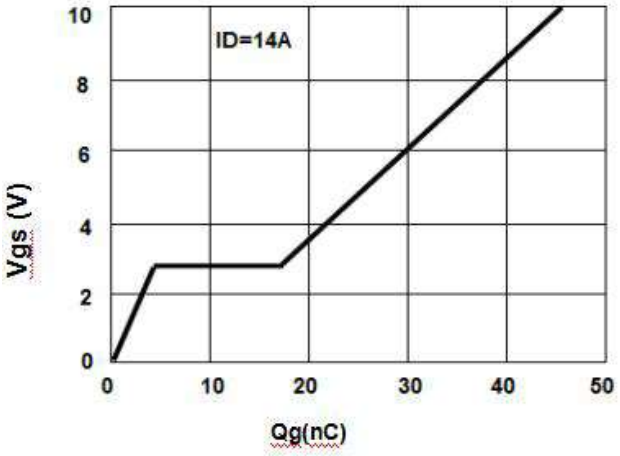


Figure 8. Capacitance

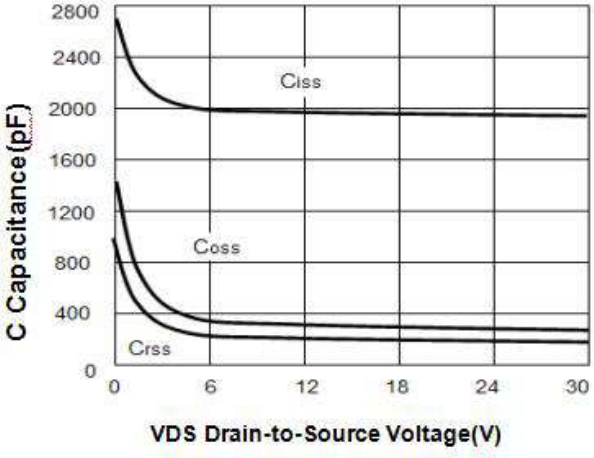


Figure 9. Body-Diode Characteristics

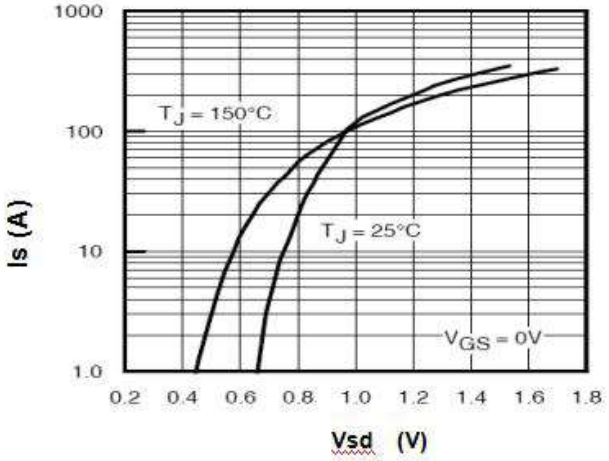
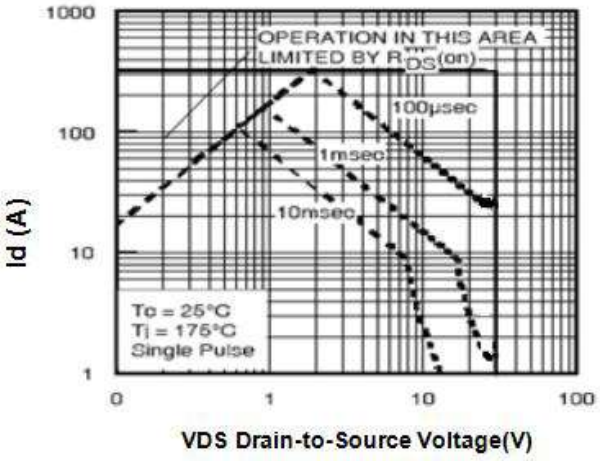
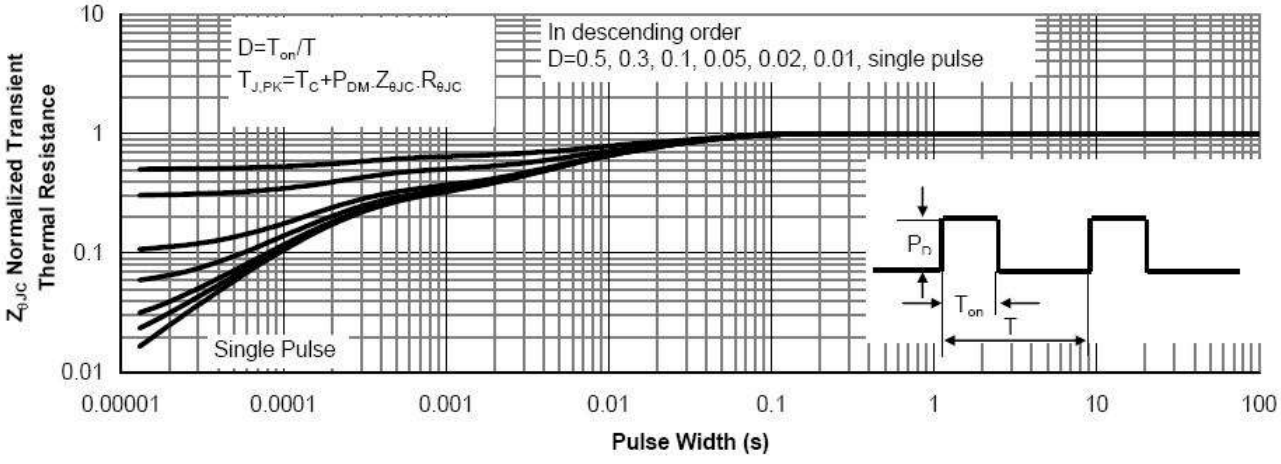


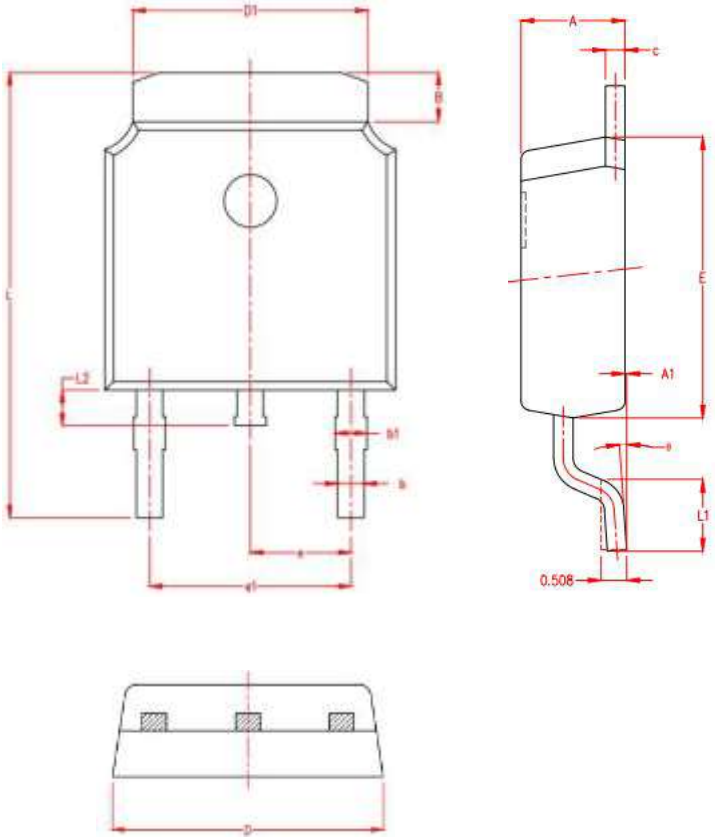
Figure 10. Maximum Safe Operating Area





6. Package Mechanical Data

TO-252 Package



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.15	2.25	2.35
A1	0.00	0.06	0.12
B	0.96	1.11	1.26
b	0.59	0.69	0.79
b1	0.69	0.81	0.93
c	0.34	0.42	0.50
D	6.45	6.60	6.75
D1	5.23	5.33	5.43
E	5.95	6.10	6.25
e	2.286TYP.		
e1	4.47	4.57	4.67
L	9.90	10.10	10.30
L1	1.40	1.55	1.70
L2	0.60	0.80	1.00
θ	0°	4°	8°