

P-Channel Enhancement Power MOSFET

1. Product Information

Features

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

Applications

Synchronous Rectification
DC-DC Converters

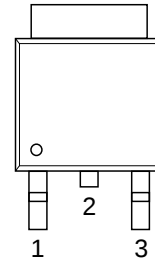
Quick reference

$V_{DS} = -30V$
 $I_D = -80A$
 $R_{DS(ON)} \leq 7.5m\Omega @ V_{GS} = -10V$ (Type: 6.3m Ω)
 $R_{DS(ON)} \leq 12m\Omega @ V_{GS} = -4.5V$ (Type: 10m Ω)

Pin Description

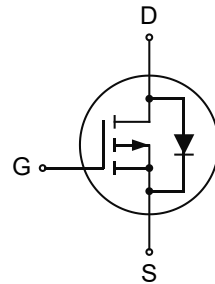
Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

Simplified Outline



Top View
TO-252

Symbol



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity
KJ80P03K	TO-252	KJ80P03K	-	-	2500

2. Absolute Maximum Ratings ($T_c = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage ($V_{GS} = 0V$)	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current @ $T_c = 25^\circ C$	-80	A
	Continuous Drain Current @ $T_c = 100^\circ C$	-63	A
I_{DM}^1	Pulsed Drain Current	-360	A
E_{AS}^2	Single Pulse Avalanche Energy	135	mJ
I_{AS}	Avalanche Current	-30	A
P_D^3	Power Dissipation @ $T_c = 25^\circ C$	79	W
	Power Dissipation @ $T_c = 100^\circ C$	39.5	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~175	$^\circ C$
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	62.5	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance from Junction to Case	2.5	$^\circ C/W$

3. Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V, T _J =25°C	-	-	-1	μA
		V _{DS} =-30V, V _{GS} =0V, T _J =100°C	-	-	-25	μA
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
V _{GS(th)}	Gate-Source Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-1.0	-1.7	-2.4	V
R _{DS(on)} ³	Drain-Source On-Resistance	V _{GS} =-10V, I _D =-20A	-	6.3	7.5	mΩ
		V _{GS} =-4.5V, I _D =-20A	-	10	12	mΩ
g _{fs} ³	Forward Transconductance	V _{DS} =-5V, I _D =-20A	30	-	-	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, f=1.0MHz	-	4942	-	pF
C _{oss}	Output Capacitance		-	473	-	
C _{rss}	Reverse Transfer Capacitance		-	461	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} =-15V, I _D =-20A, R _G =2.5Ω	-	182	-	ns
t _r	Turn-on Rise Time		-	262	-	
t _{d(off)}	Turn-off Delay Time		-	1.3	-	
t _f	Turn-off Fall Time		-	9.8	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DD} =-15V, V _{GS} =-10V, I _D =-20A,	-	82	-	nC
Q _{gs}	Gate-Source Charge		-	14	-	
Q _{gd}	Gate-Drain Charge		-	16	-	
Diode Characteristics						
I _S	Continuous Body Diode Current	T _C =25°C	-	-	-80	A
I _{SM}	Pulse Diode Forward Current	T _C =25°C	-	-	-360	A
V _{SD}	Body Diode Voltage	T _J =25°C, I _{SD} =-15A, V _{GS} =0V	-	-	-1.2	V
T _{rr}	Reverse Recovery Time	I _F =-15A, dI _F /dt=100A/μs	-	34	-	ns
Q _{rr}	Reverse Recovery Charge		-	79	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS}=-30A, L=0.3mH, V_{DD}=30V, R_G=25Ω, Starting T_J=25°C
3. Pulse test: Pulse width ≤ 300μs, duty cycle ≤ 2%

4. Typical Characteristics

Figure 1. Output Characteristics

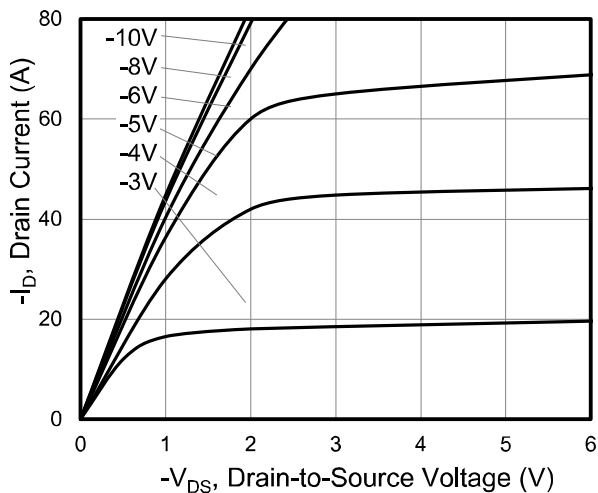


Figure 2. Transfer Characteristics

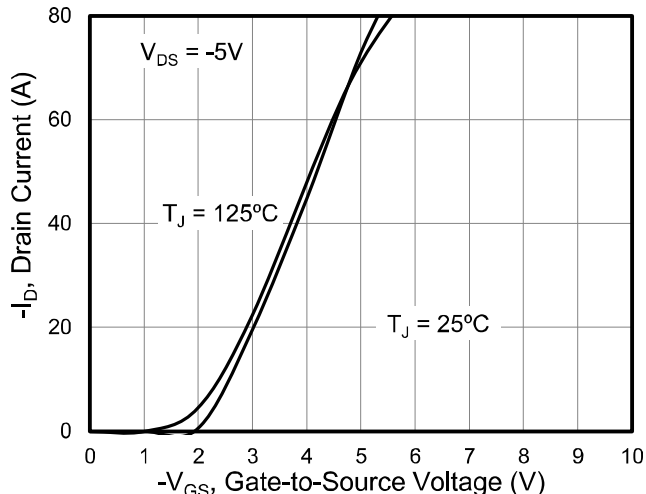


Figure 3. On-Resistance vs. Drain Current

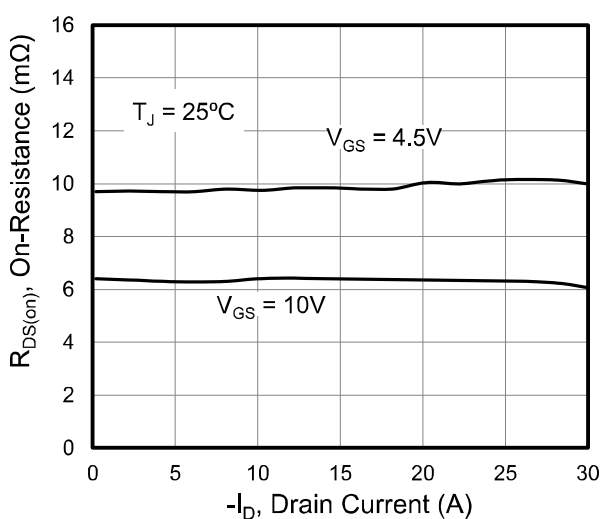


Figure 4. Capacitance

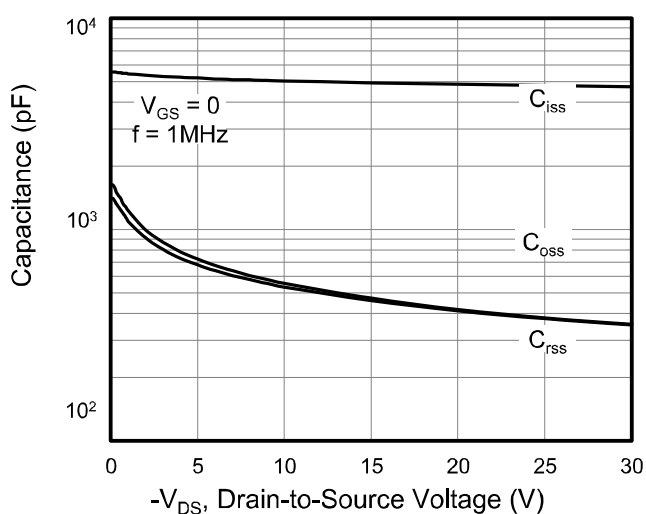


Figure 5. Gate Charge

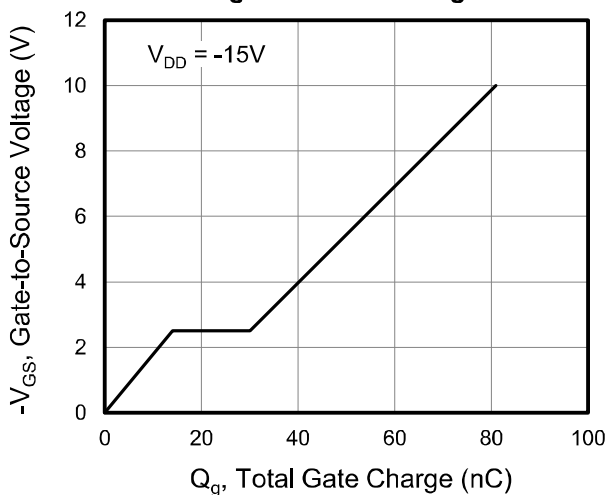
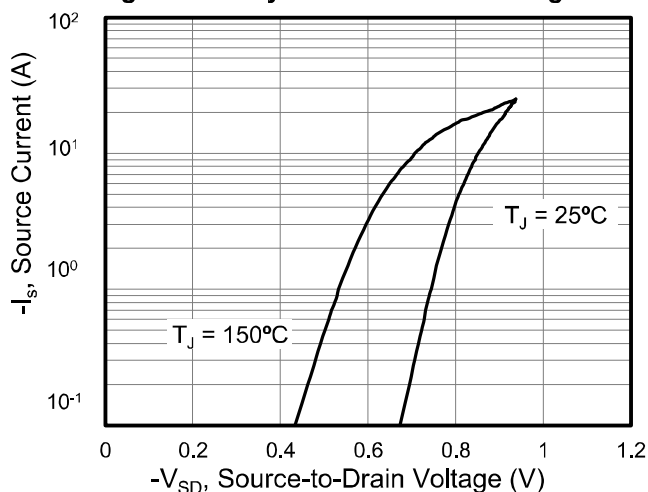


Figure 6. Body Diode Forward Voltage



4. Typical Characteristics (cont.)

Figure 7. On-Resistance vs. Junction Temperature

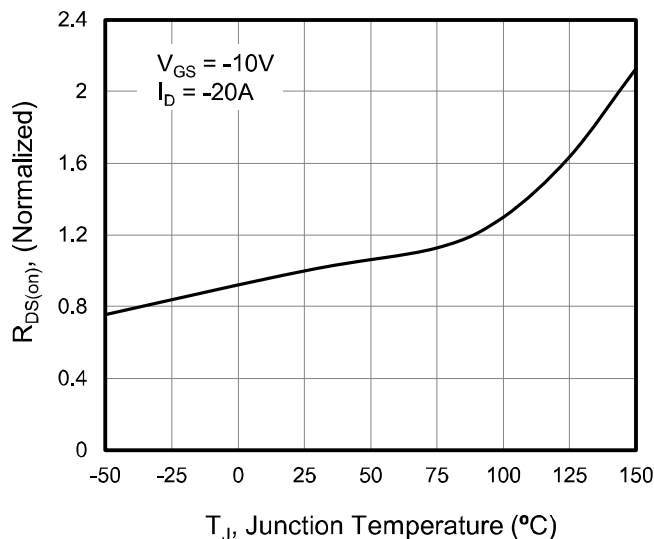


Figure 8. Threshold Voltage vs. Junction Temperature

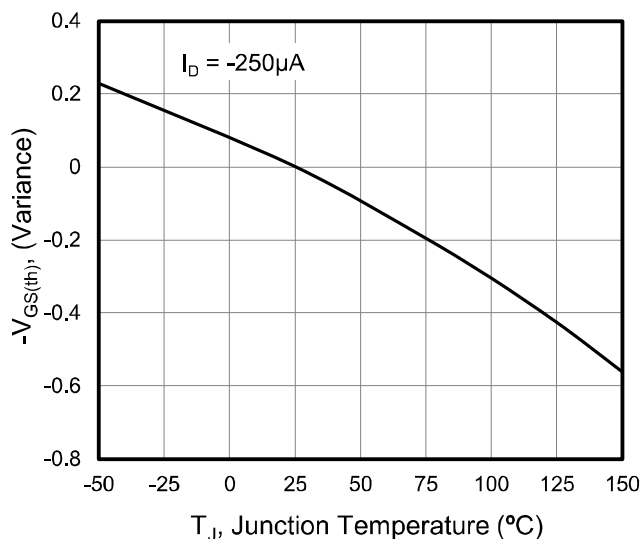


Figure 9. Transient Thermal Impedance

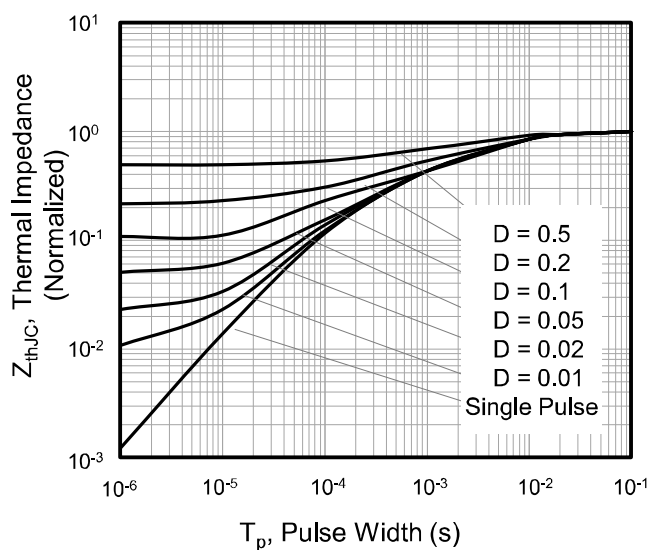


Figure 10. Safe operation area

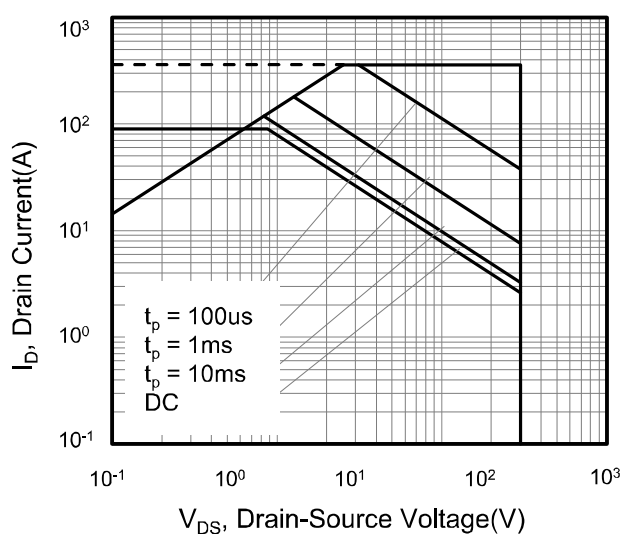


Figure A: Gate Charge Test Circuit and Waveform

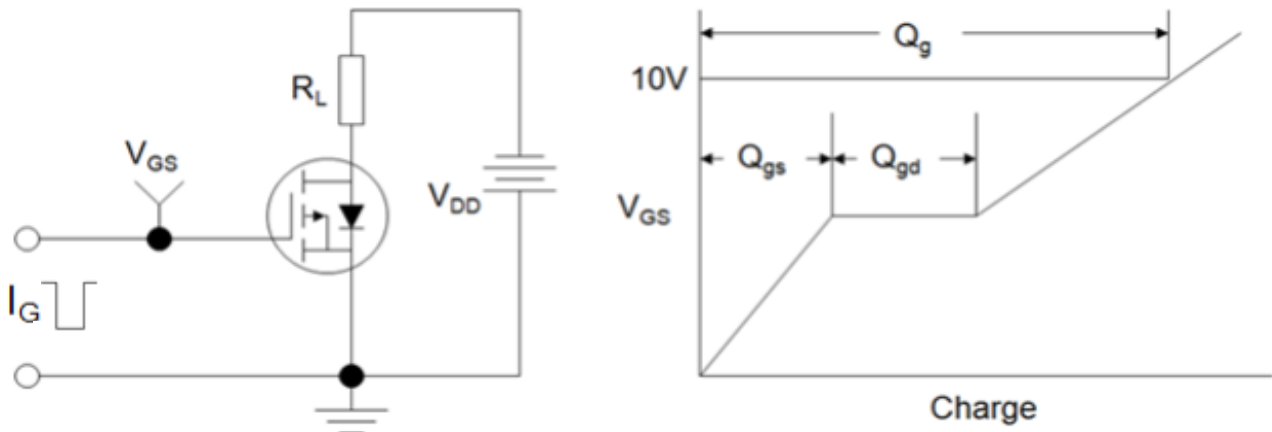


Figure B: Resistive Switching Test Circuit and Waveform

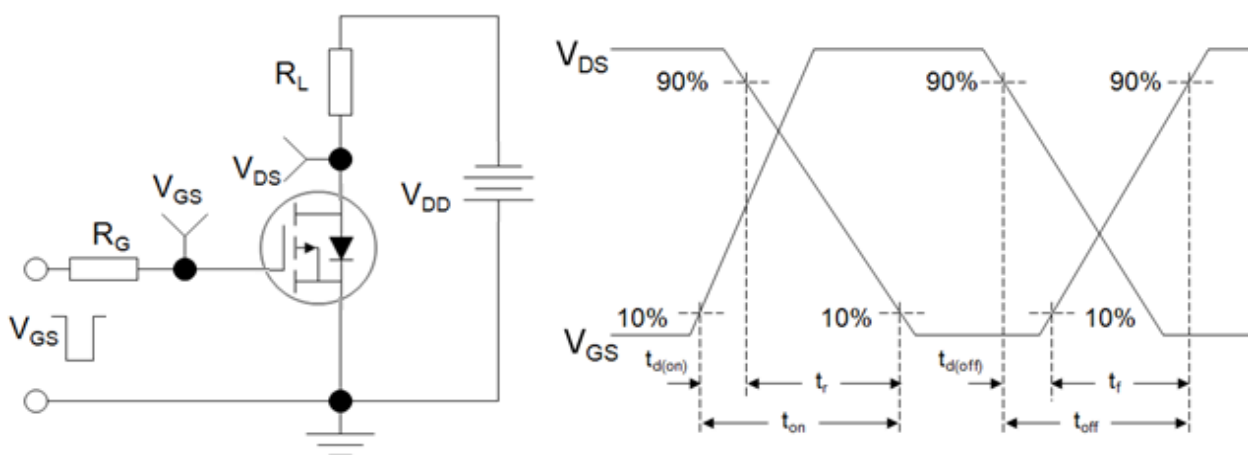
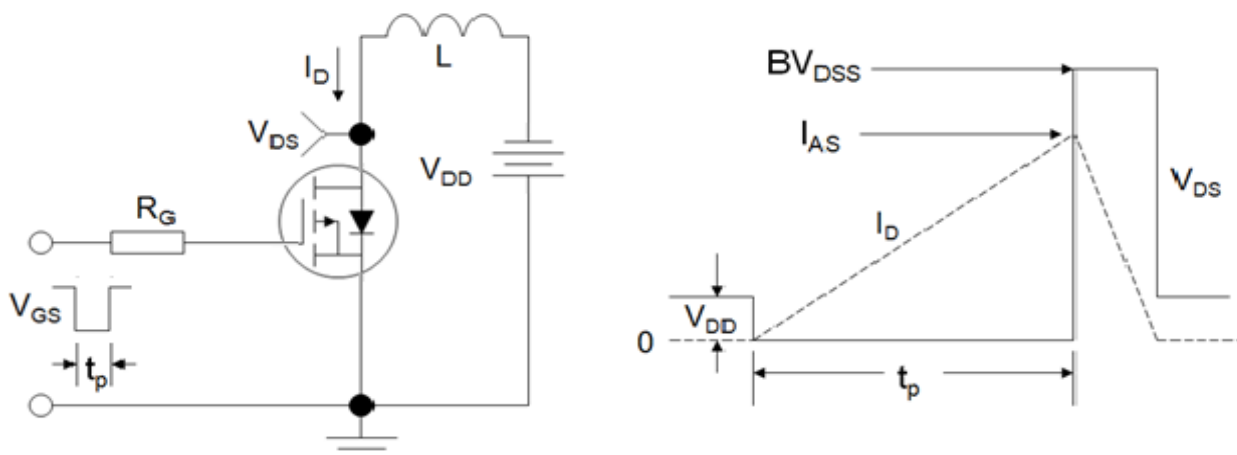
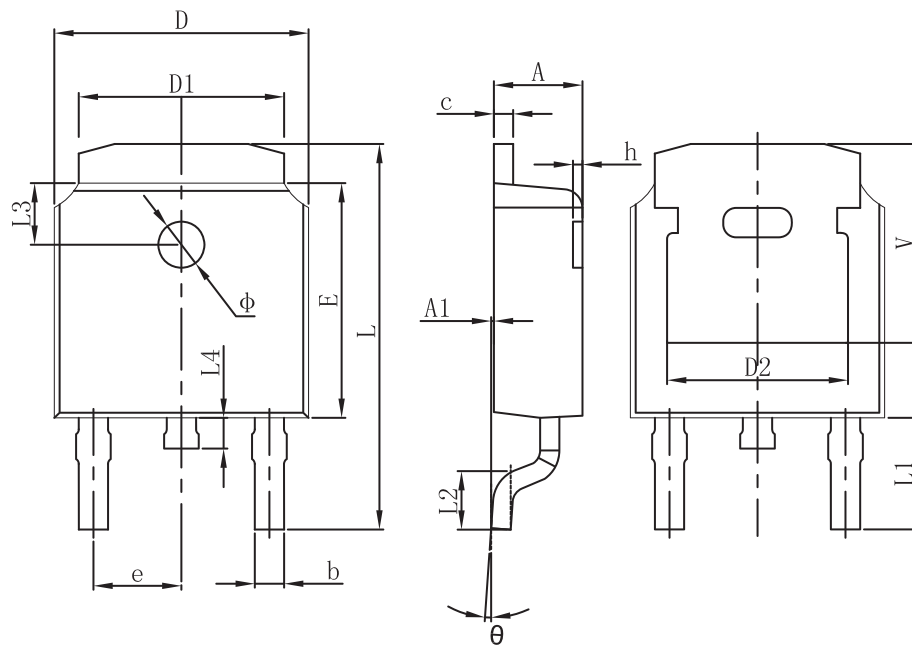


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



5. Package Dimensions

TO-252 Package



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	2.200	2.400
A1	0.020	0.200
b	0.635	0.770
c	0.460	0.580
D	6.500	6.700
D1	5.100	5.460
D2	4.830 REF	
E	6.000	6.200
e	2.186	2.386
L	9.712	10.312
L1	2.900 REF	
L2	1.400	1.700
L3	1.600 REF	
L4	0.600	1.000
Φ	1.100	1.300
θ	0°	8°
H	0.000	0.300
V	5.250 REF	