KSD40P45

-40V P-Channel MOSFET

General Description

The KSD40P45 uses advanced trench technology and design to provide excellent R_{DS}(ON) with low gate charge .This device is well suited for high current load applications.

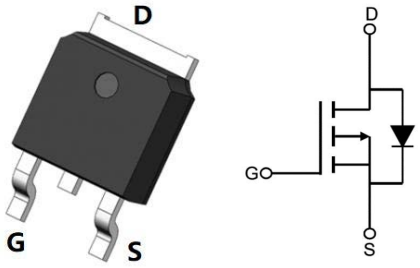
Product Summary

V_{DS} (V)	$R_{DS(on)}$ (mΩ)	I_D (A)
-40	16 at V_{GS} = 10 V	-45
	21 at V_{GS} = 4.5 V	-37

Features

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

TO-252 Pin Configuration



Applications

- High side switch for full bridge converter
- DC/DC converter for LCD display

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25℃)	-45	A
	Drain Current – Continuous (T_C=100℃)	-35	A
I_{DM}	Drain Current – Pulsed[1]	-70	A
P_D	Power Dissipation (T_C=25℃)	50	W
	Power Dissipation (T_C=100℃)	1	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	57	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	2.36	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-40	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-20V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-20V , V_{GS}=0V , T_J=125℃	---	---	-10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V , I_D=-10A	---	16	19	mΩ
		V_{GS}=-4.5V , I_D=-7A	---	21	24	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	-1.0	-1.78	-3	V
gfs	Forward Transconductance	V_{DS}=-5V , I_S=-10A	---	30	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge	V_{DS}=-15V , V_{GS}=-10V , I_D=-10A	---	36	---	nC
Q_{gs}	Gate-Source Charge		---	4.7	---	
Q_{gd}	Gate-Drain Charge		---	5.8	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=-15V, I_D=-10A V_{GS}=-10V,R_G=3Ω	---	11	---	ns
T_r	Rise Time		---	17	---	
$T_{d(off)}$	Turn-Off Delay Time		---	39	---	
T_f	Fall Time		---	22	---	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , F=1MHz	---	2765	---	pF
C_{oss}	Output Capacitance		---	158	---	
C_{rss}	Reverse Transfer Capacitance		---	106	---	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	-45	A
I_{SM}	Pulsed Source Current		---	---	-65	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1.2	V

Note :

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
5. E_{AS} condition: Tj=25℃,V_{DD}=-15V,V_G=-10V,L=0.5mH,Rg=25Ω

Typical Electrical and Thermal Characteristics (Curves)

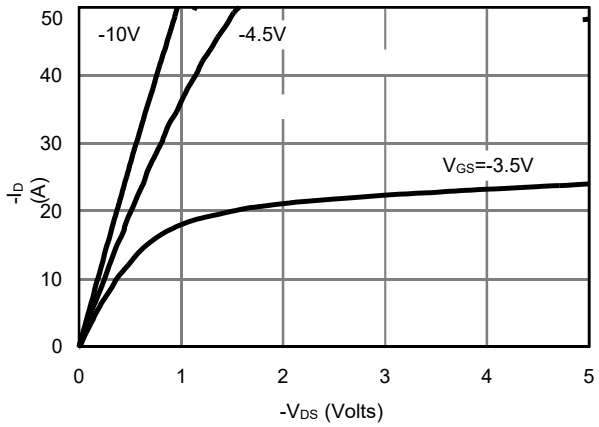


Figure 1: On-Region Characteristics

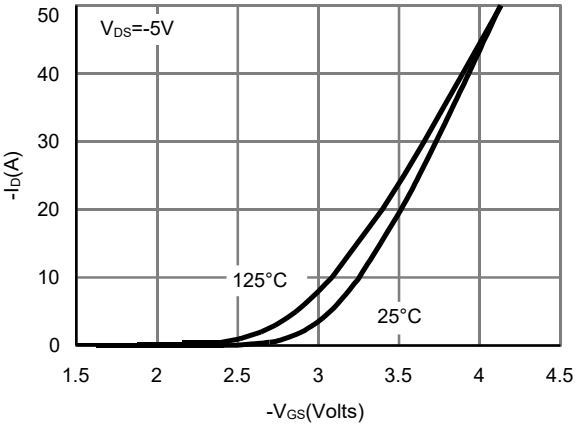


Figure 2: Transfer Characteristics

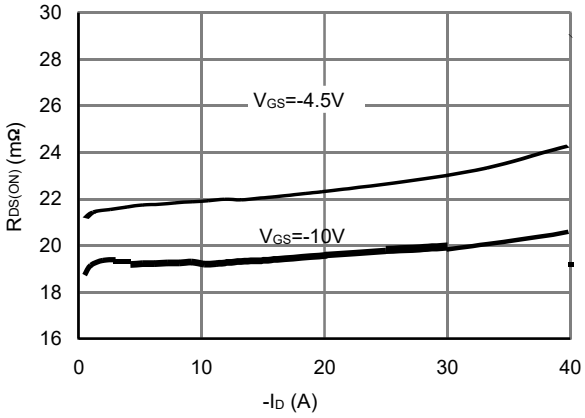


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

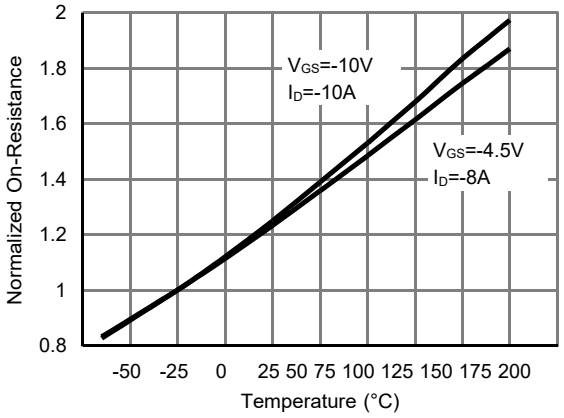


Figure 4: On-Resistance vs. Junction Temperature

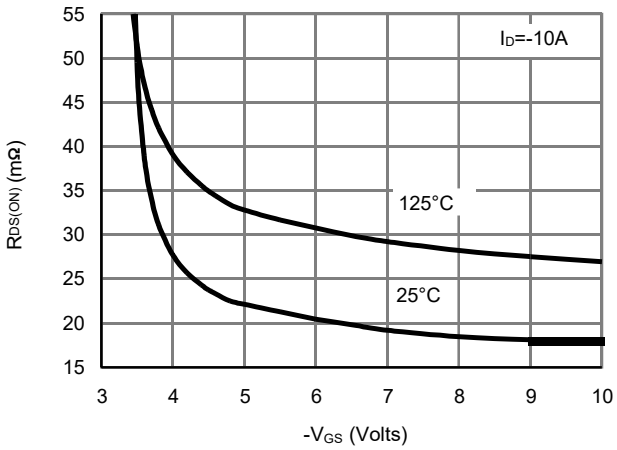


Figure 5: On-Resistance vs. Gate-Source Voltage

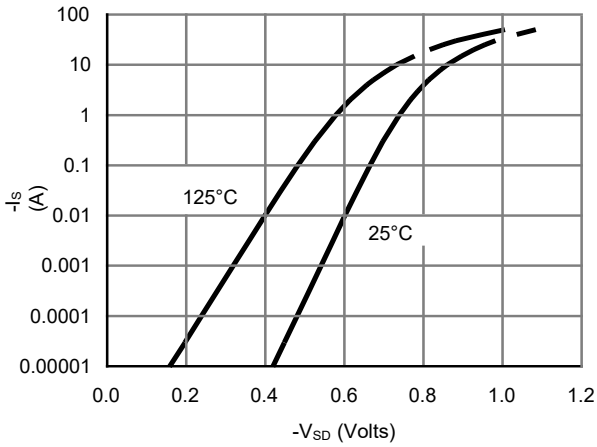


Figure 6: Body-Diode Characteristics

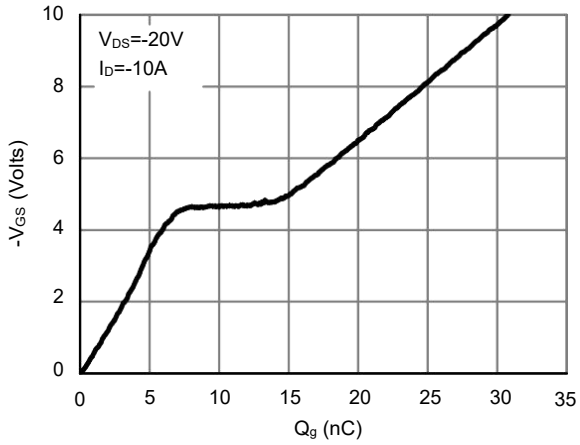


Figure 7: Gate-Charge Characteristics

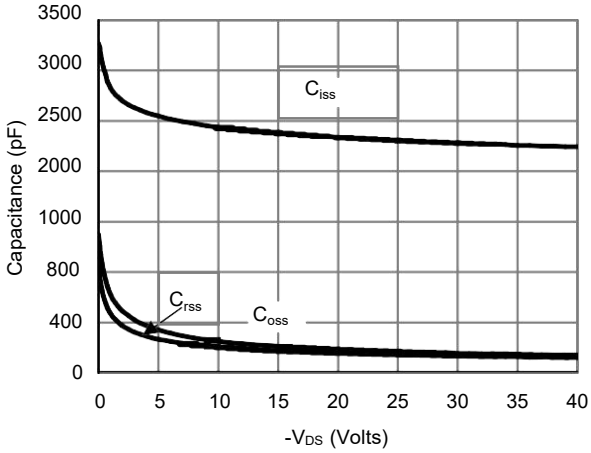


Figure 8: Capacitance Characteristics

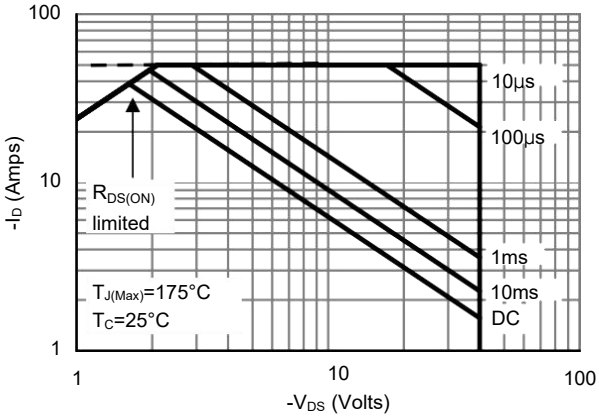


Figure 9: Maximum Forward Biased Safe Operating Area

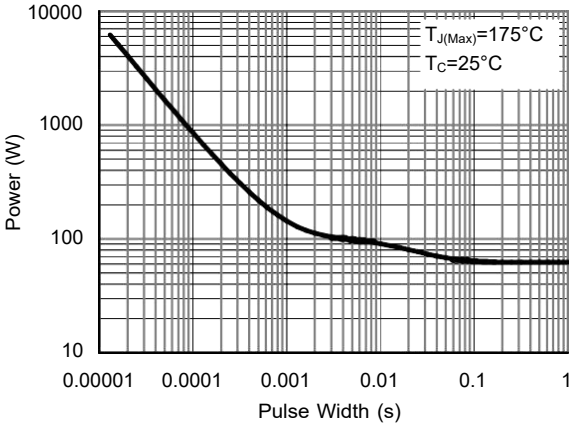


Figure 10: Single Pulse Power Rating Junction-to-Case

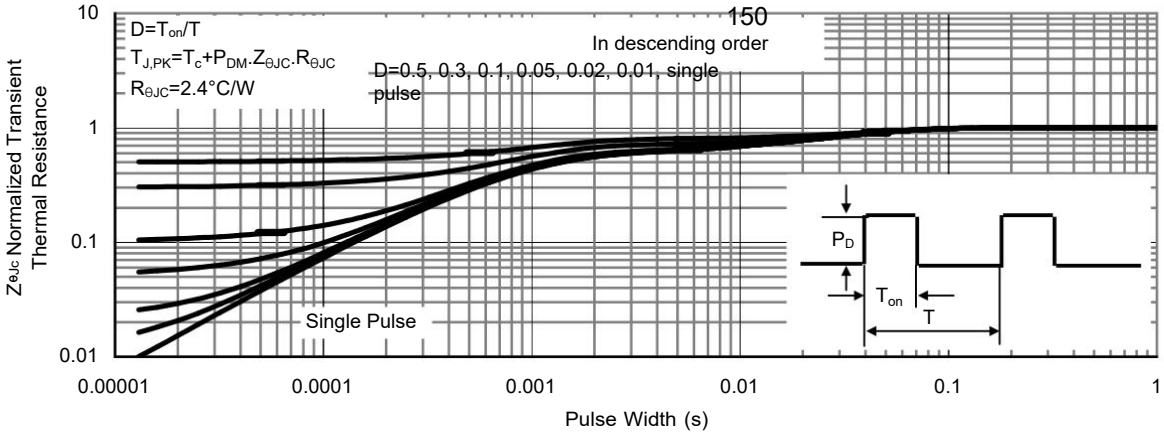


Figure 11: Normalized Maximum Transient Thermal Impedance

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