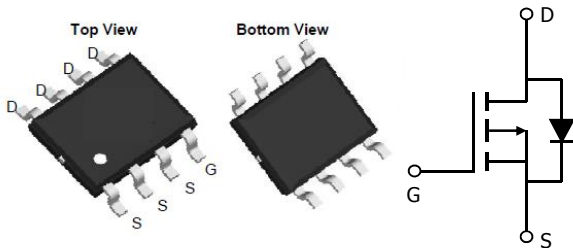


General Description

The KSP40P05 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible onresistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

SOP-8 Pin Configuration



Product Summary

V_{DS} (V)	$R_{DS(on)}$ (m Ω)	I_D (A)
-40	35 at $V_{GS} = 10$ V	-6.5
	50 at $V_{GS} = 4.5$ V	-5.5

Features

- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

Applications

- Power switching application
- Hard switched and high frequency circuits
- DC-DC converter

Absolute Maximum Ratings $T_c=25^\circ\text{C}$ 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 ($T_c=25^\circ\text{C}$)	-6.5	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	-3.9	A
I_{DM}	Drain Current – Pulsed ¹	-39	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	2.5	W
	Power Dissipation ($T_c=100^\circ\text{C}$)	0.05	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	57	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	10	$^\circ\text{C}/\text{W}$

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-40	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-35V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-35V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-5A$	---	35	44	$m\Omega$
		$V_{GS}=-4.5V, I_D=-3A$	---	50	65	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.5	3	V
g_{fs}	Forward Transconductance	$V_{DS}=-15V, I_S=-4A$	---	20	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge	$V_{DS}=-20V, V_{GS}=-10V, I_D=-5A$	---	20	---	nC
Q_{gs}	Gate-Source Charge		---	6	---	
Q_{gd}	Gate-Drain Charge		---	5	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-20V, R_L=2\Omega$ $V_{GS}=-10V, R_G=3\Omega$	---	7	---	ns
T_r	Rise Time		---	9	---	
$T_{d(off)}$	Turn-Off Delay Time		---	32	---	
T_f	Fall Time		---	11	---	
C_{iss}	Input Capacitance	$V_{DS}=-20V, V_{GS}=0V, F=1\text{MHz}$	---	1250	---	pF
C_{oss}	Output Capacitance		---	105	---	
C_{riss}	Reverse Transfer Capacitance		---	85	---	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	-6.5	A
I_{SM}	Pulsed Source Current		---	---	-24	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1.2	V

Note :

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

Typical Electrical and Thermal Characteristics (Curves)

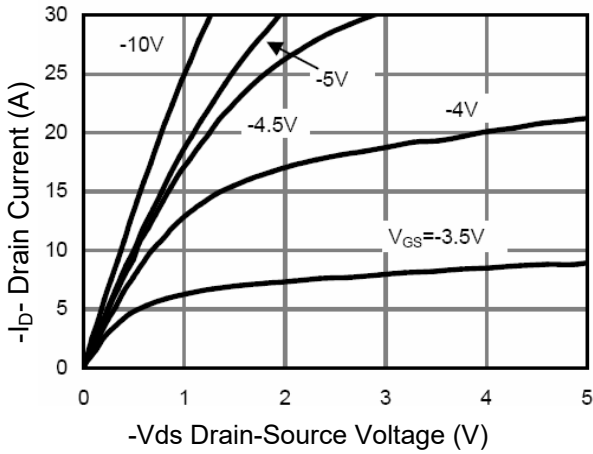


Fig. 1 Output Characteristics

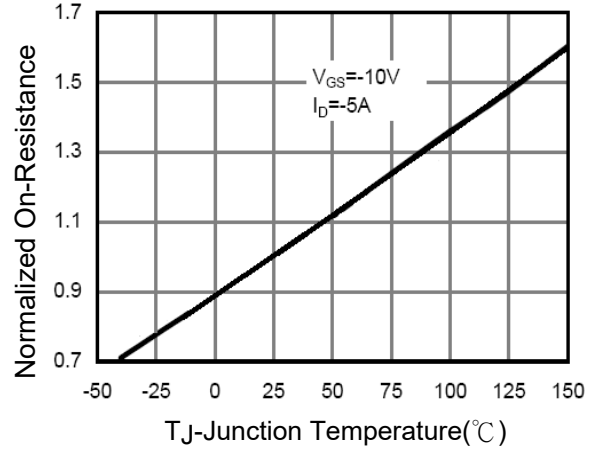


Fig. 4 Rds(on)-Junction Temperature

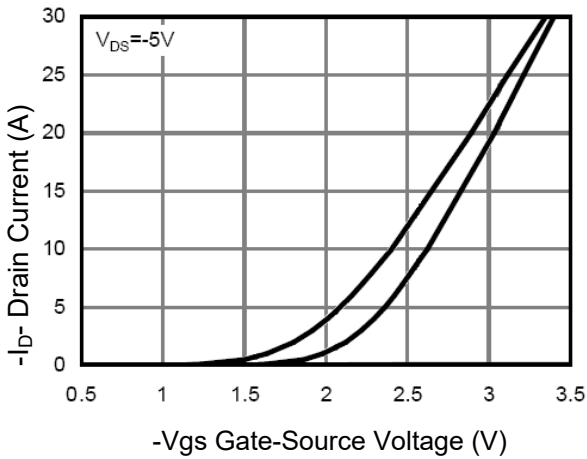


Fig. 2 Transfer Characteristics

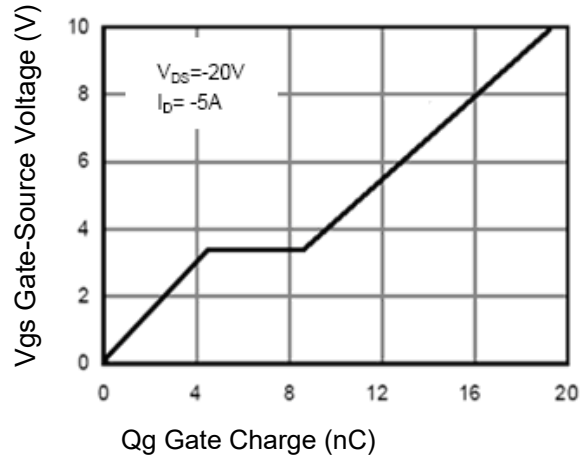


Fig. 5 Gate Charge

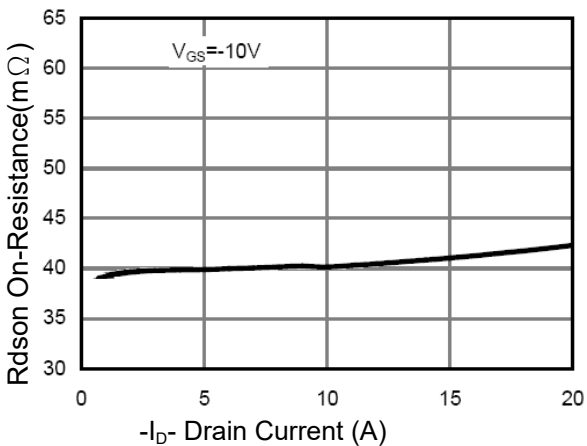


Fig. 3 Rds(on)- Drain Current

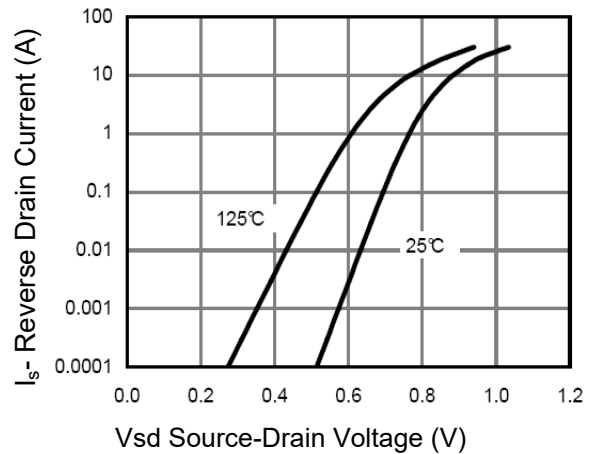


Fig. 6 Source- Drain Diode Forward

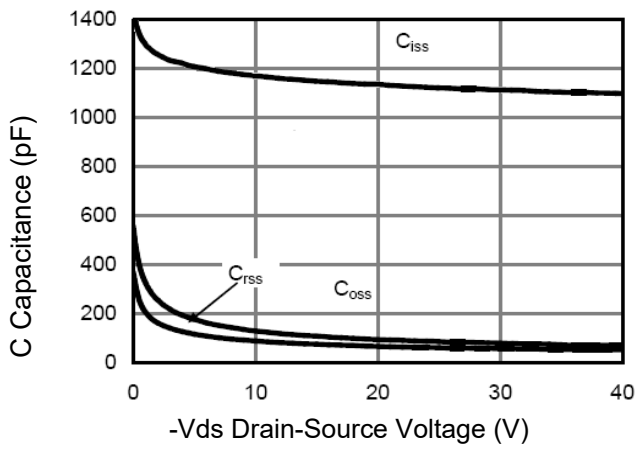


Fig.7 Capacitance vs Vds

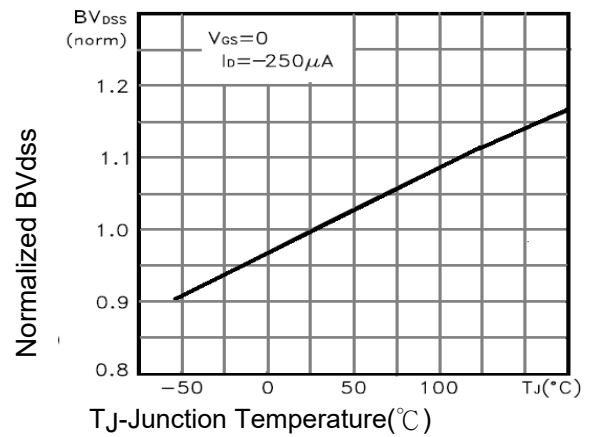


Fig. 8 BVdss vs Junction Temperature

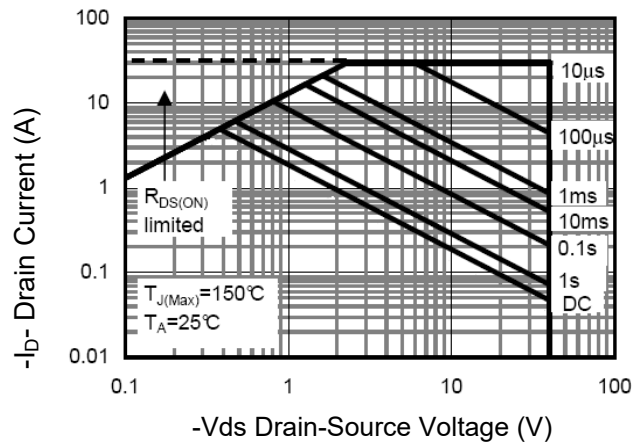


Fig.9 Safe Operation Area

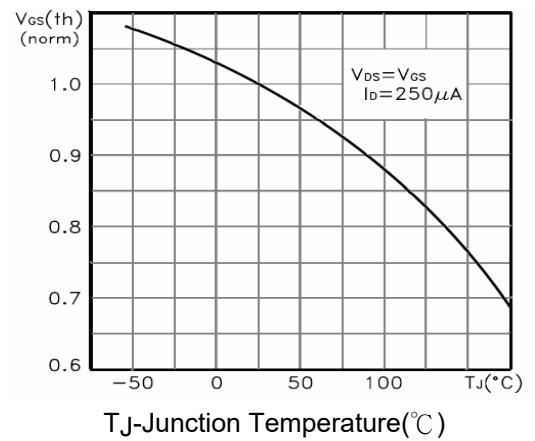


Fig. 10 $I_{VGS(th)}$ vs Junction Temperature

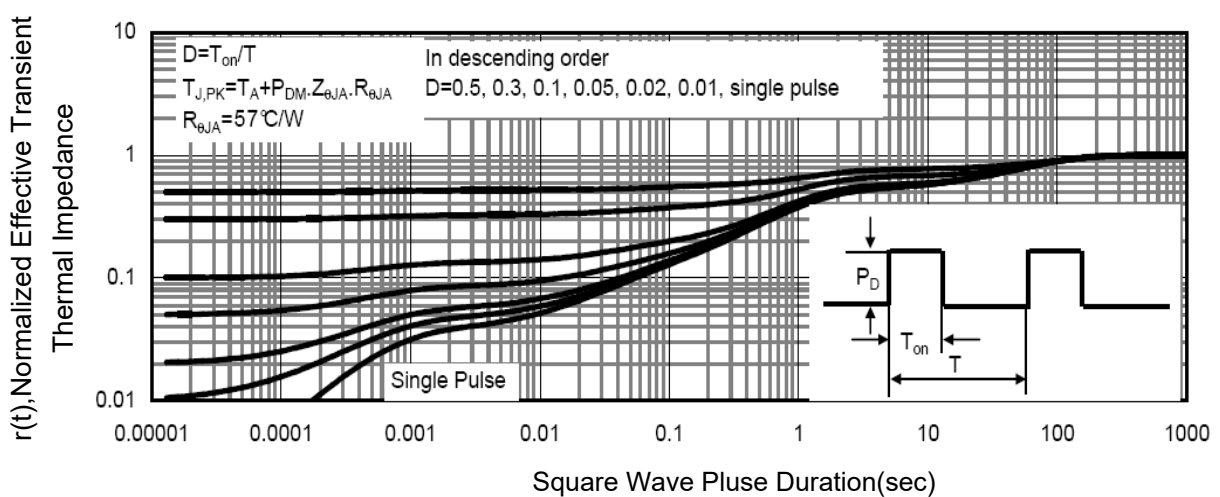


Fig.11 Normalized Maximum Transient Thermal Impedance

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