

### General Description

The KSD05N30 is silicon N-channel Enhanced VDMOSFET, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.

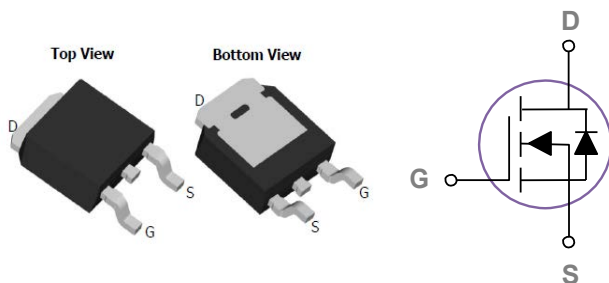
### Product Summary

$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
300	1.2 at $V_{GS} = 10$ V	5
	1.5 at $V_{GS} = 4.5$ V	2.7

### Features

- Trench Power MV MOSFET technology
- Low Gate Charge
- Optimized for fast-switching applications

### TO-252 Pin Configuration



### Applications

- Synchronous Rectification in DC/DC and AC/DC Converters
- Industrial and Motor Drive applications

### Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	300	V
$V_{GS}$	Gate-Source Voltage	$\pm 25$	V
$I_D$	Drain Current – Continuous ( $T_c=25^\circ\text{C}$ )	5	A
	Drain Current – Continuous ( $T_c=100^\circ\text{C}$ )	2	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	18	A
$P_D$	Power Dissipation ( $T_c=25^\circ\text{C}$ )	35	W
	Power Dissipation ( $T_c=100^\circ\text{C}$ )	1	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	---	60	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	3.78	$^\circ\text{C}/\text{W}$

### 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	$V_{GS}=0V, I_D=250\mu A$	300	---	---	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=300V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu A$
		$V_{DS}=120V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA

#### On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=3A$	---	1.2	1.5	$\Omega$
		$V_{GS}=4.5V, I_D=2A$	---	1.5	1.9	$\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	2.7	3.2	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4	---	$mV/^\circ\text{C}$
$g_{fs}$	Forward Transconductance	$V_{DS}=10V, I_S=3A$	---	8	---	S

#### Dynamic and switching Characteristics

$Q_g$	Total Gate Charge <sup>2, 3</sup>	$V_{DS}=50V, V_{GS}=10V, I_D=3A$	---	9.2	---	nC	
$Q_{gs}$	Gate-Source Charge <sup>2, 3</sup>		---	2	---		
$Q_{gd}$	Gate-Drain Charge <sup>2, 3</sup>		---	3.7	---		
$T_{d(on)}$	Turn-On Delay Time <sup>2, 3</sup>	$V_{DS}=50V, I_D=3A$	---	16	---	ns	
$T_r$	Rise Time <sup>2, 3</sup>		$V_{GS}=10V, R_G=10\Omega$	---	39		---
$T_{d(off)}$	Turn-Off Delay Time <sup>2, 3</sup>		---	---	68		---
$T_f$	Fall Time <sup>2, 3</sup>		---	54	---		
$C_{iss}$	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, F=1\text{MHz}$	---	560	---	pF	
$C_{oss}$	Output Capacitance		---	84	---		
$C_{riss}$	Reverse Transfer Capacitance		---	62	---		

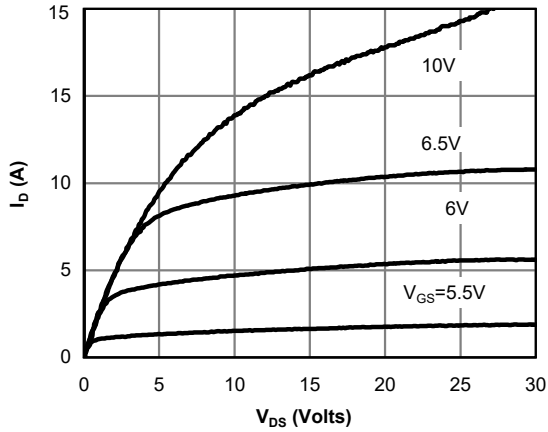
#### Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	5	A
$I_{SM}$	Pulsed Source Current		---	---	14	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.2	V

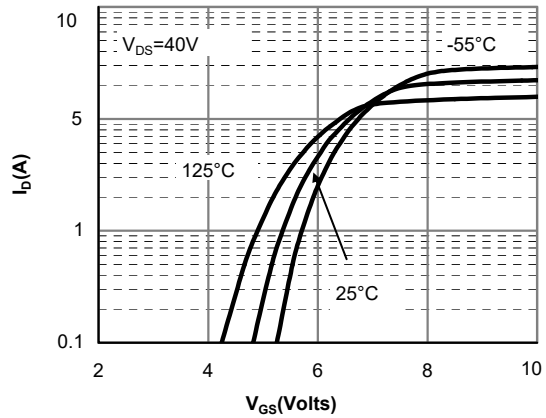
Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

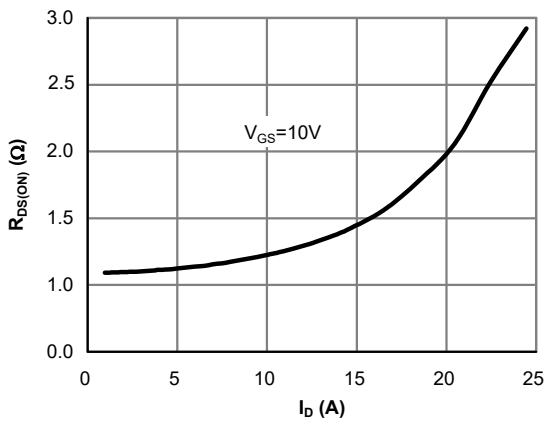
**Typical Electrical and Thermal Characteristics (Curves)**



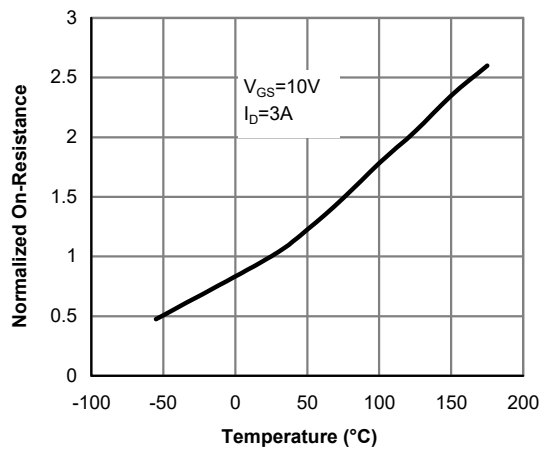
**Fig 1: On-Region Characteristics**



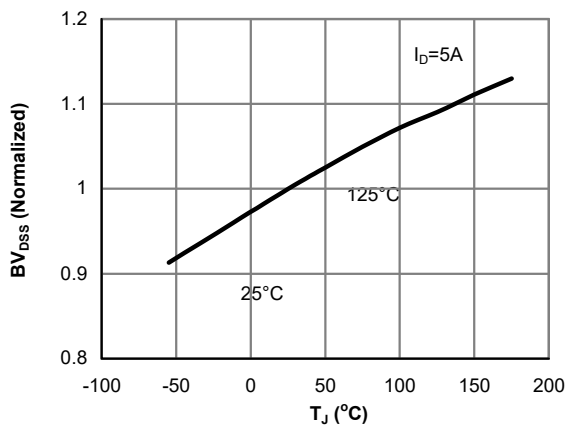
**Figure 2: Transfer Characteristics**



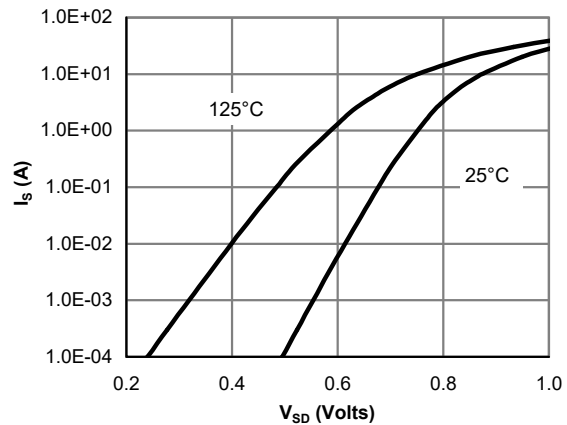
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**



**Figure 4: On-Resistance vs. Junction Temperature**



**Figure 5: Break Down vs. Junction Temperature**



**Figure 6: Body-Diode Characteristics**

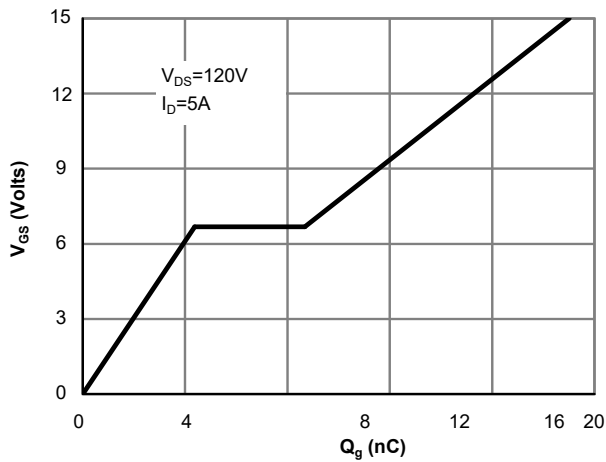


Figure 7: Gate-Charge Characteristics

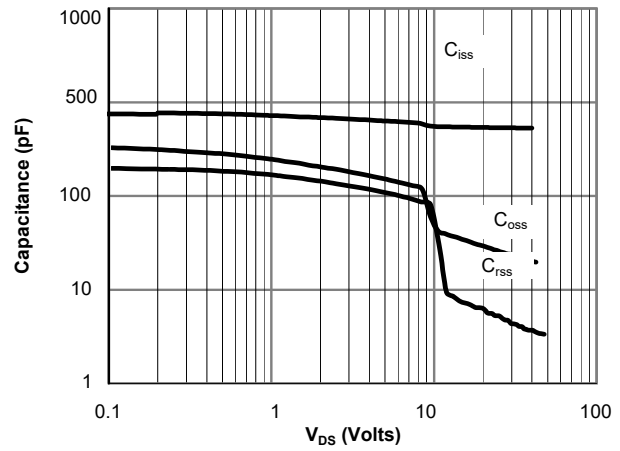


Figure 8: Capacitance Characteristics

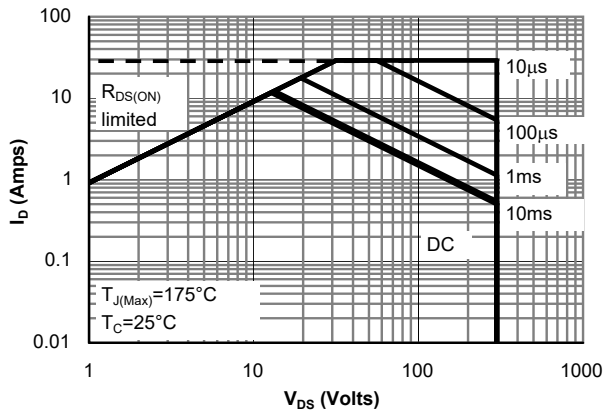


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

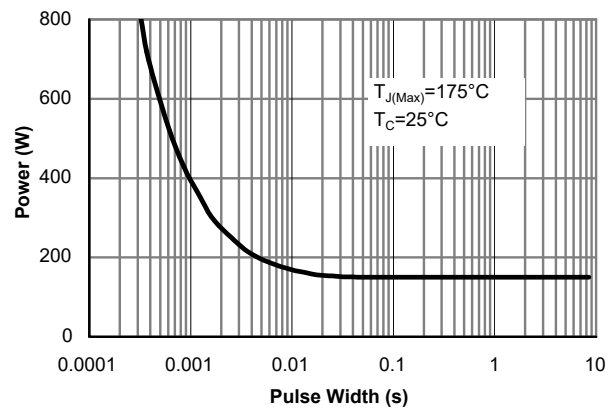


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

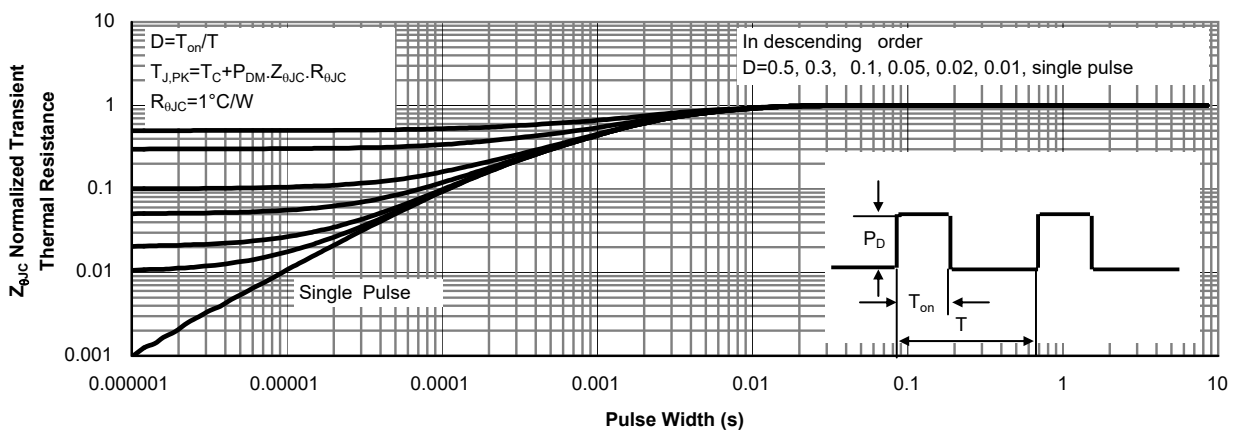


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

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