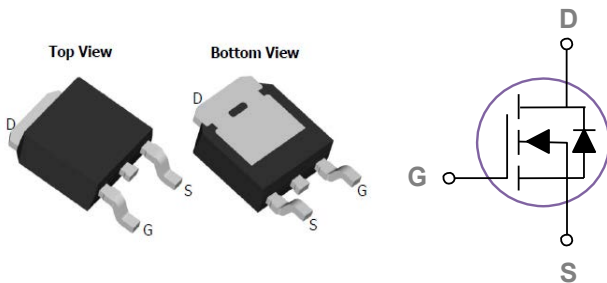


General Description

The KSD70N10 MOSFETs are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extremely efficient device for use in a wide range of power applications.

TO-252 Pin Configuration



Product Summary

V_{DS} (V)	$R_{DS(on)}$ (m Ω)	I_D (A)
100	8 at $V_{GS} = 10$ V	70
	11 at $V_{GS} = 4.5$ V	60

Features

- Special process technology for high ESD capability
- High density cell design for ultra low $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_c=25^\circ\text{C}$)	70	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	56	A
I_{DM}	Drain Current – Pulsed ¹	210	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	60	W
	Power Dissipation ($T_c=100^\circ\text{C}$)	1.2	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	---	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	2	$^\circ\text{C}/\text{W}$

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	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	20	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	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	$V_{GS}=10V, I_D=20A$	---	8	10	$m\Omega$
		$V_{GS}=4.5V, I_D=10A$	---	11	14	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.8	3	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	3	---	$mV/^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_S=5A$	---	30	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=50V, V_{GS}=10V, I_D=20A$	---	111	---	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	12	---	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	24	---	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DS}=50V, I_D=20A$ $V_{GS}=10V, R_G=2.5\Omega$	---	12	---	ns
T_r	Rise Time ^{2, 3}		---	55	---	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		---	45	---	
T_f	Fall Time ^{2, 3}		---	47	---	
C_{iss}	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, F=1\text{MHz}$	---	4200	---	pF
C_{oss}	Output Capacitance		---	210	---	
C_{riss}	Reverse Transfer Capacitance		---	170	---	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	70	A
I_{SM}	Pulsed Source Current		---	---	130	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
5. EAS condition: $T_J=25^\circ\text{C}, V_{DD}=50V, V_G=10V, L=0.5mH, R_G=25\Omega$

Typical Electrical and Thermal Characteristics (Curves)

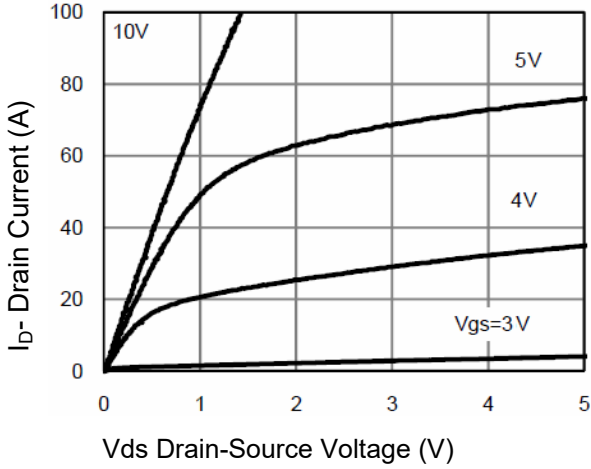


Fig.1 Output Characteristics

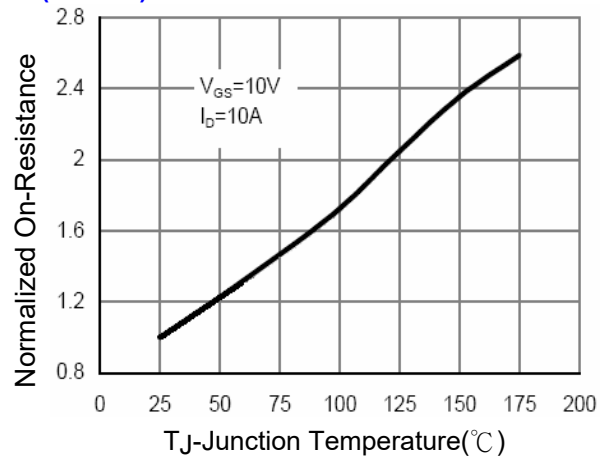


Fig. 4 Rds(on)-Junction Temperature

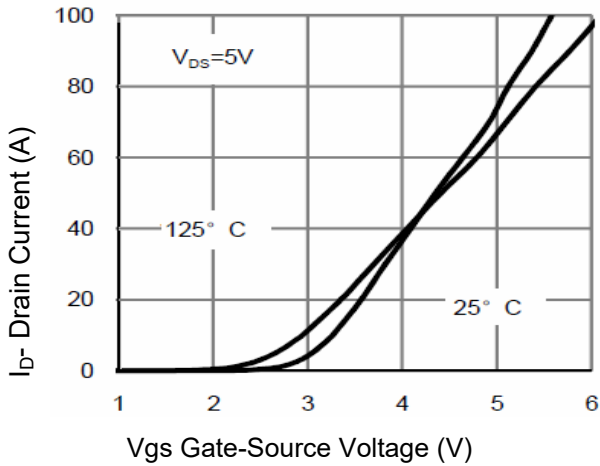


Fig. 2 Transfer Characteristics

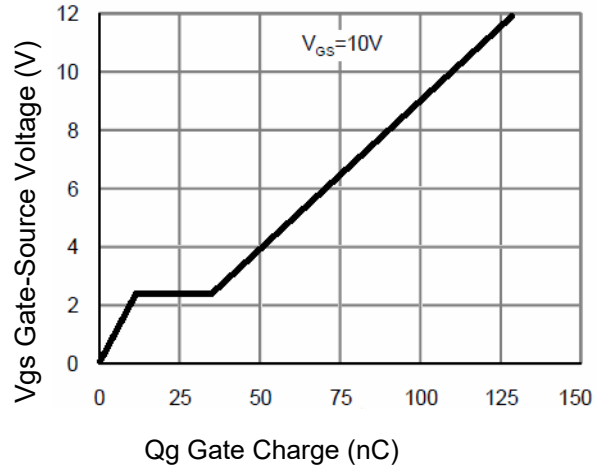


Fig. 5 Gate Charge

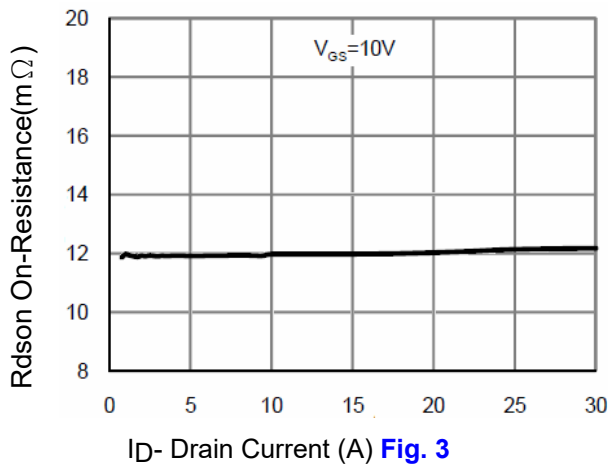


Fig. 3 Rds(on)- Drain Current

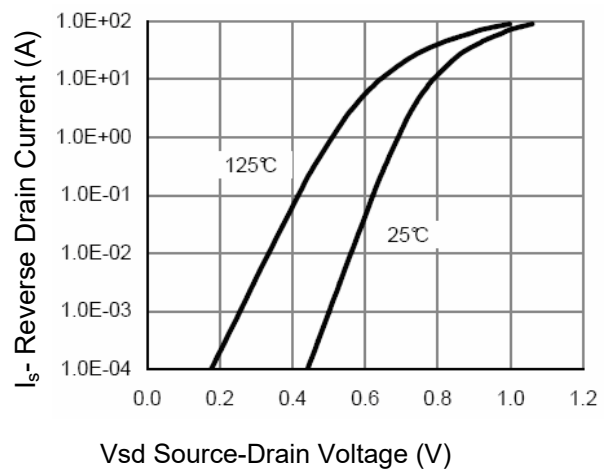


Fig. 6 Source- Drain Diode Forward

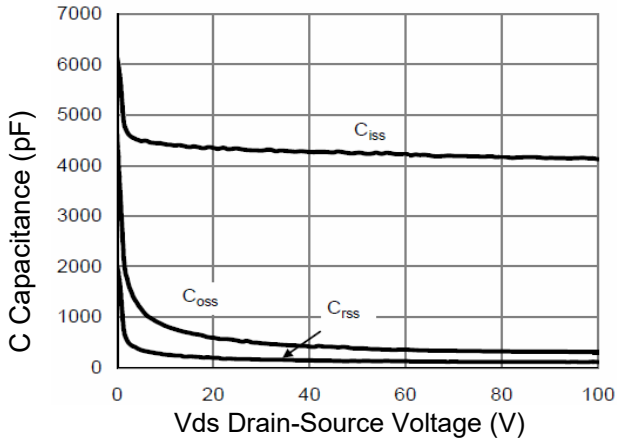


Fig.7 Capacitance vs Vds

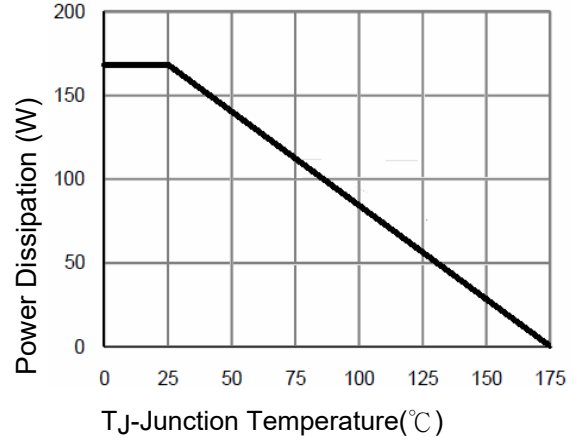


Fig. 8 Power De-rating

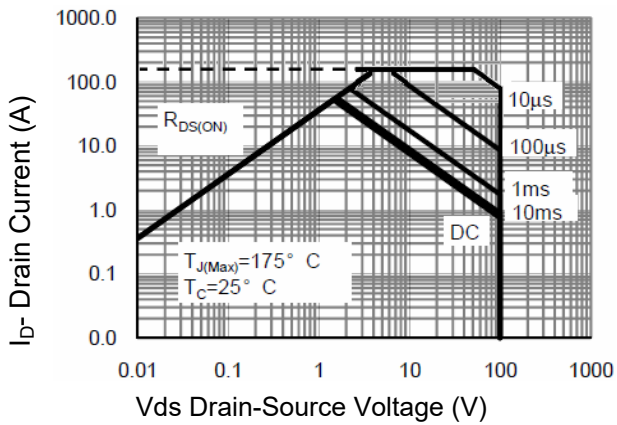


Fig.9 Safe Operation Area

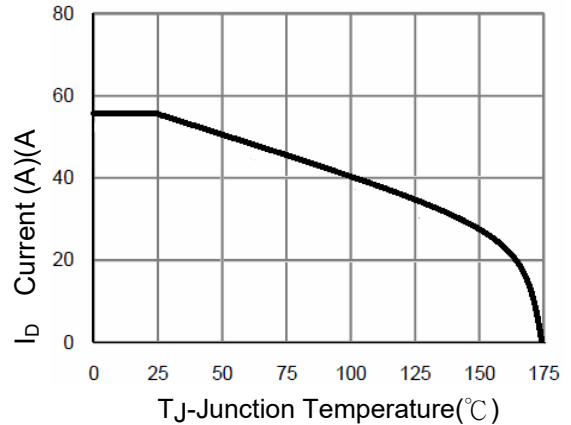


Fig. 10 ID Current- Junction Temperature

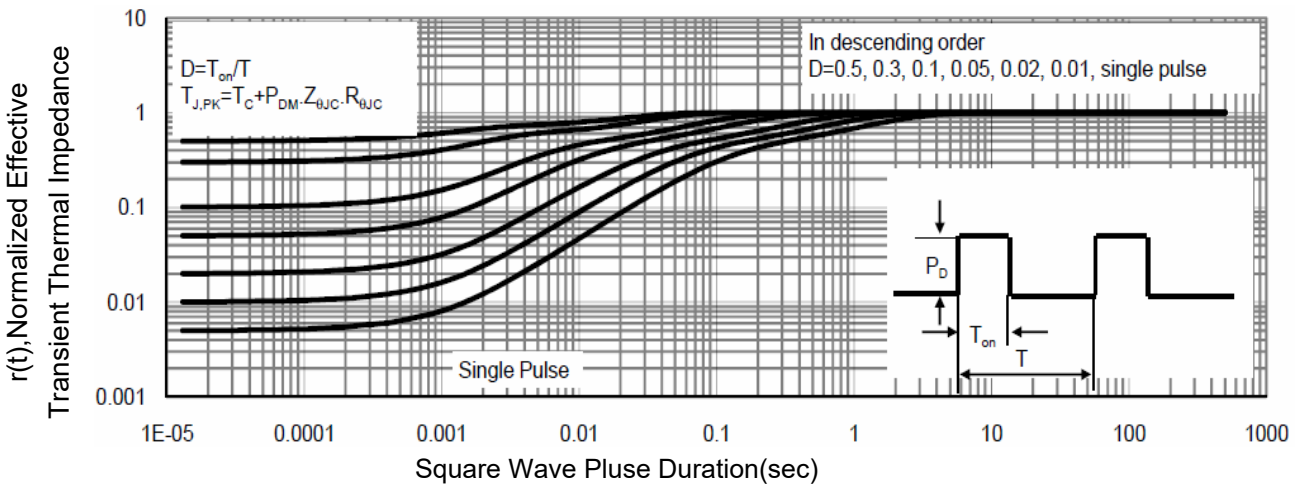


Fig.11 Normalized Maximum Transient Thermal Impedance

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