



P-Ch 150V Fast Switching MOSFETs

Applications

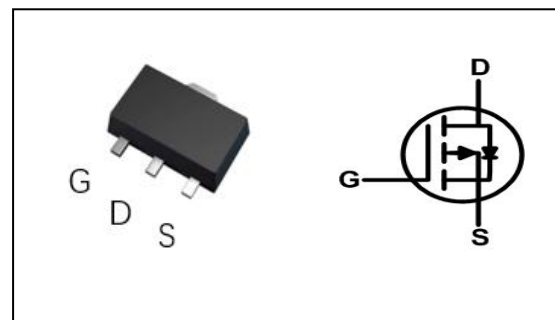
- Load Switch.
- Power Management.
- LED Backlighting.
- Networking application.

- 100% EAS Guaranteed
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

Product Summary

V_{DS}	-150	V
$R_{DS(ON),max}$	780	m Ω
I_D	-3	A

SOT-89 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_A=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	-3	A
$I_D@T_A=70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	-2.1	A
I_{DM}	Pulsed Drain Current ²	-12	A
EAS	Single Pulse Avalanche Energy ³	12.5	mJ
I_{AS}	Avalanche Current	-5	A
$P_D@T_A=25^\circ C$	Total Power Dissipation ⁴	1.7	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	80	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	40	$^\circ C/W$



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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-150	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-1A	---	650	780	mΩ
		V _{GS} =-6V, I _D =-0.5A	---	700	980	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-2.0	-3.0	-4.0	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	5.42	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-120V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =-120V, V _{GS} =0V, T _J =150°C	---	---	30	
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ± 20V, V _{DS} =0V	---	---	± 100	nA
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	12	---	Ω
Q _g	Total Gate Charge (-4.5V)	V _{DS} =-75V, V _{GS} =-10V, I _D =-1A	---	10.5	---	nC
Q _{gs}	Gate-Source Charge		---	3.2	---	
Q _{gd}	Gate-Drain Charge		---	2.3	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-30V, V _{GS} =-10V, R _G =6Ω, I _D =-1A	---	21	---	ns
T _r	Rise Time		---	17	---	
T _{d(off)}	Turn-Off Delay Time		---	40	---	
T _f	Fall Time		---	18	---	
C _{iss}	Input Capacitance	V _{DS} =-75V, V _{GS} =0V, F=1MHz	---	715	---	pF
C _{oss}	Output Capacitance		---	21	---	
C _{rss}	Reverse Transfer Capacitance		---	14	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,6}	V _G =V _D =0V, Force Current	---	---	-3	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.



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P-Channel Typical Characteristics

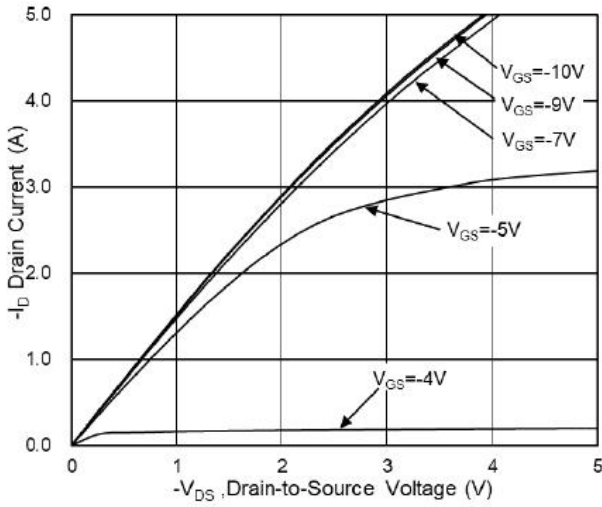


Fig.1 Typical Output Characteristics

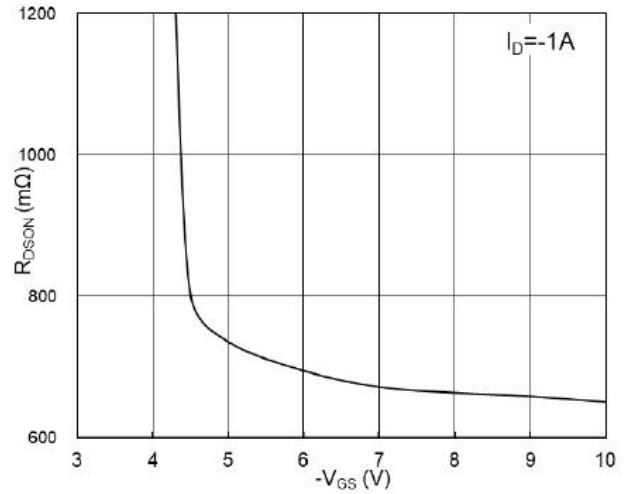


Fig.2 On-Resistance vs. G-S Voltage

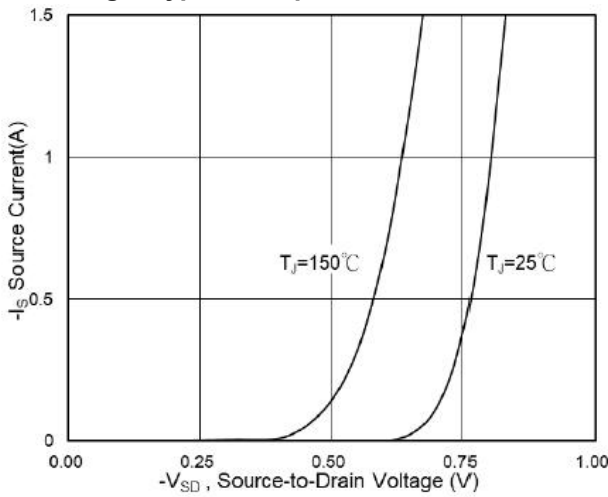


Fig.3 Forward Characteristics Of Reverse

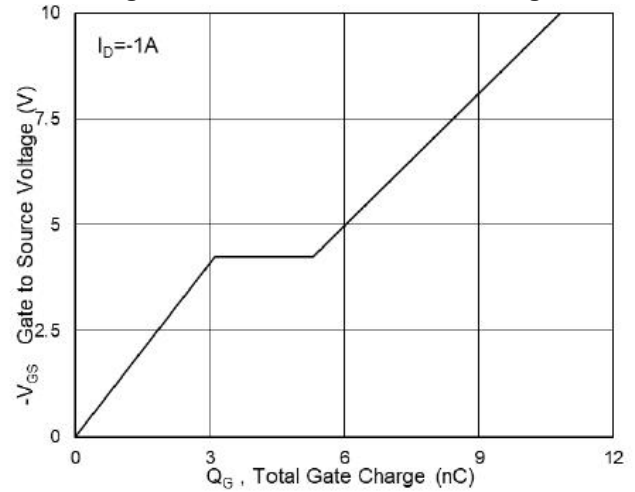


Fig.4 Gate-Charge Characteristics

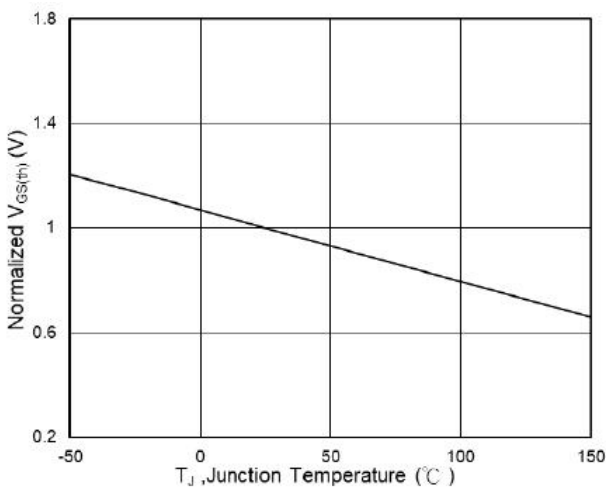


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

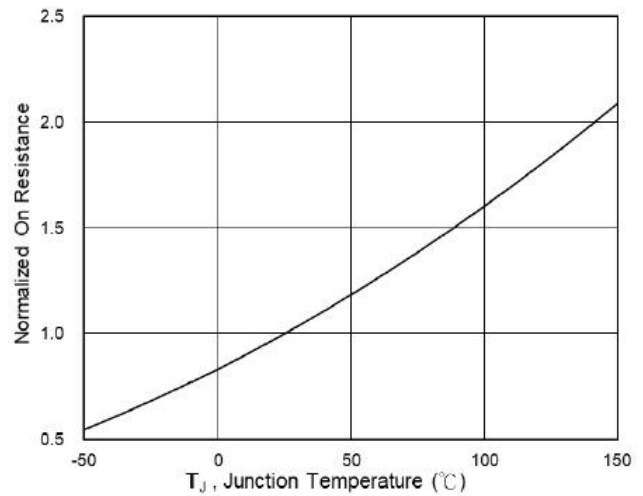


Fig.6 Normalized $R_{DS(on)}$ vs. T_J



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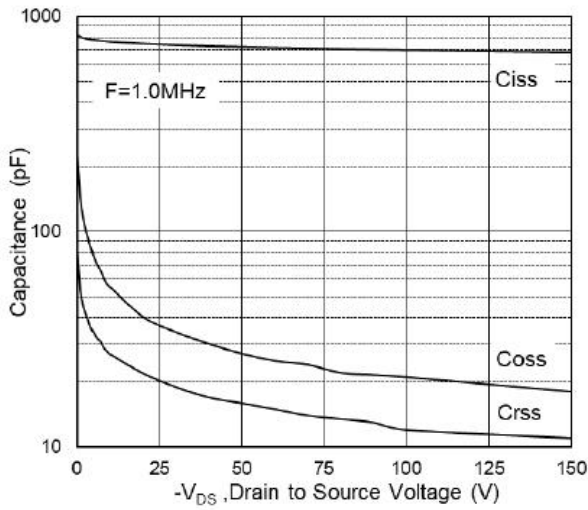


Fig.7 Capacitance

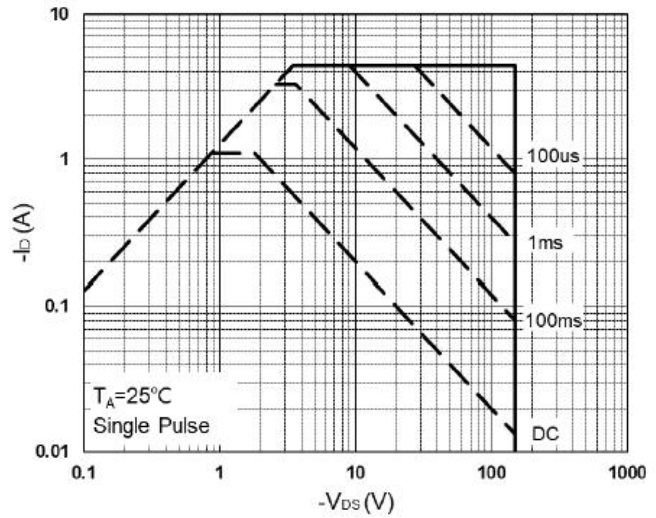


Fig.8 Safe Operating Area

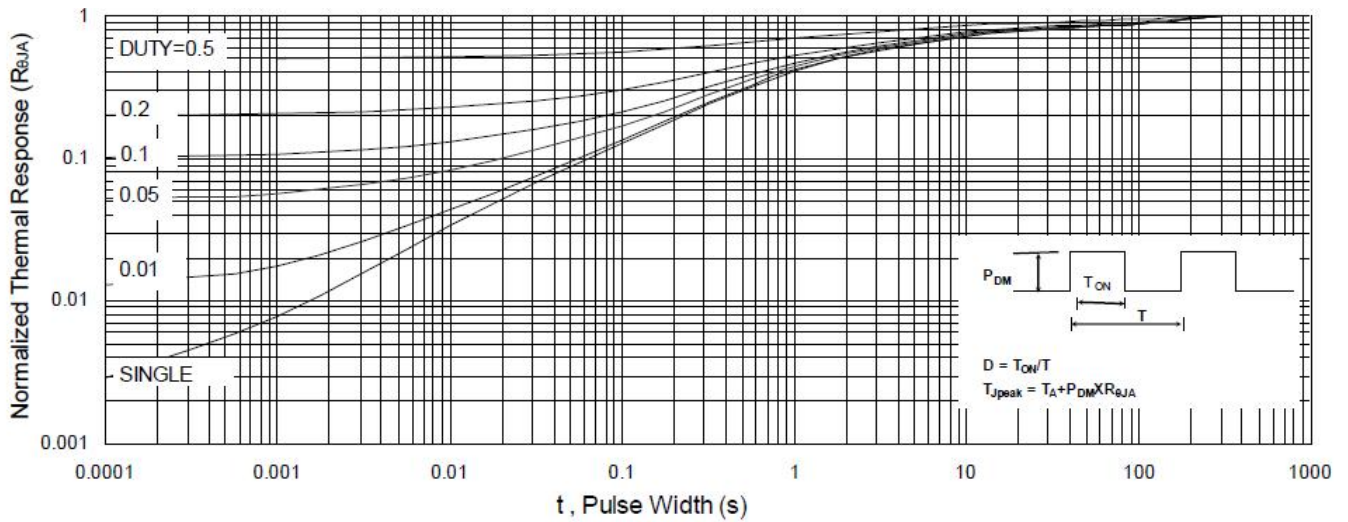


Fig.9 Normalized Maximum Transient Thermal Impedance

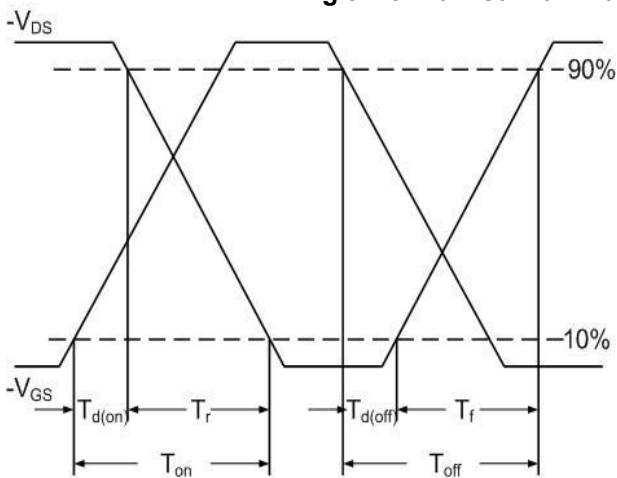


Fig.10 Switching Time Waveform

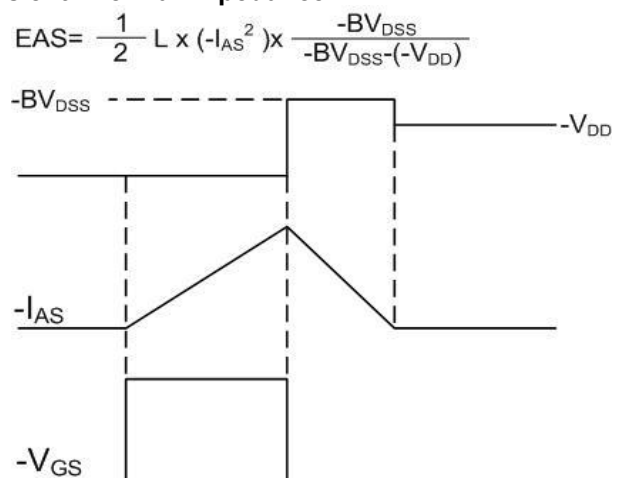


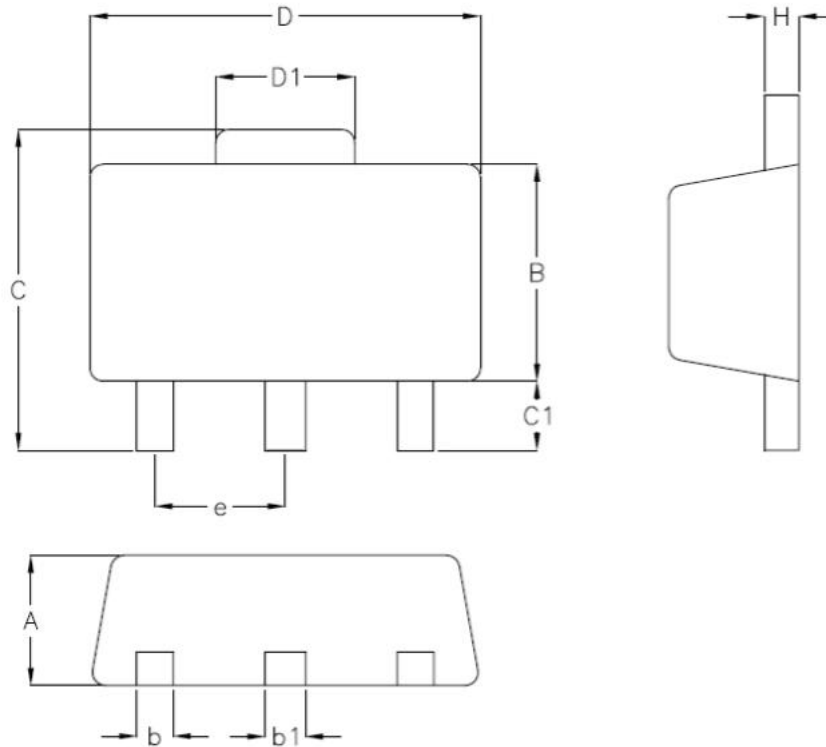
Fig.11 Unclamped Inductive Waveform

$$EAS = \frac{1}{2} L \times (-I_{AS}^2) \times \frac{-BV_{DSS}}{-BV_{DSS} - (-V_{DD})}$$



Ordering Information

Part Number	Package code	Packaging
HSK3P15	SOT-89	1000/Tape&Reel



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.397	1.600	0.055	0.063
b	0.420	0.540	0.017	0.021
b1	0.420	0.540	0.017	0.021
B	2.388	2.591	0.094	0.102
C	3.937	4.242	0.155	0.167
C1	0.787	1.194	0.031	0.047
D	4.394	4.597	0.173	0.181
D1	1.397	1.753	0.055	0.069
e	1.448	1.549	0.057	0.061
H	0.350	0.44	0.014	0.017