HC3134K

20V N-Channel MOSFET

General Description

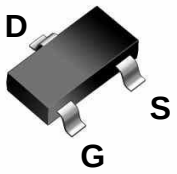
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

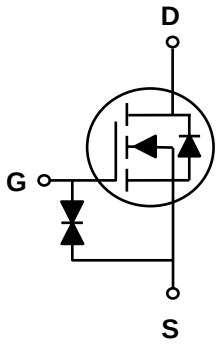
Features

V_{DS}	20V
I_D (at V_{GS}=4.5V)	0.9A
$R_{DS(ON)}$ (at V_{GS}=4.5V)	220mΩ(Typ)

ESD Protected Up to 2.0KV (HBM)

SOT23





Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±12	V
Drain Current-Continuous	TC=25°C	I_D	0.9	A
	TC=70°C	I_D	0.7	A
Drain Current – Pulsed		I_{DM}	3.5	A
Maximum Power Dissipation		P_D	0.35	W
Junction and Storage Temperature Range		T_J,T_{STG}	-55 To 150	℃

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance junction-to-solder poin	$R_{\theta Jc}$		40	℃ /W
Thermal Resistance junction-to-Ambient	$R_{\theta JA}$		357	℃ /W

Electrical Characteristics (TJ=25℃ unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	20			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V,V_{GS}=0V			1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±10V,V_{DS}=0V			±10	μA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	0.35	0.70	1.2	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=4.5V, I_D=0.9A		220	300	mΩ
		V_{GS}=2.5V, I_D=0.4A		290	400	mΩ
		V_{GS}=1.8V, I_D=0.2A		420	700	mΩ
I_S	Maximum Body-Diode Continuous Current				0.9	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{DS}=10V,V_{GS}=0V, F=1.0MHz		33		pF
C_{oss}	Output Capacitance			20		pF
C_{rss}	Reverse Transfer Capacitance			10		pF
SWITCHING PARAMETERS						
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=4.5V V_{DS}=10V R_G=25Ω I_D=0.5A		4		nS
t_r	Turn-on Rise Time			18.8		nS
$t_{d(off)}$	Turn-Off Delay Time			10		nS
t_f	Turn-Off Fall Time			23		nS
Q_g	Total Gate Charge	V_{DS}=10V,I_D=0.5A, V_{GS}=4.5V		0.8		nC
Q_{gs}	Gate-Source Charge			0.3		nC
Q_{gd}	Gate-Drain Charge			0.15		nC
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_{SD}=1A		0.70	1.3	V

Note：

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

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

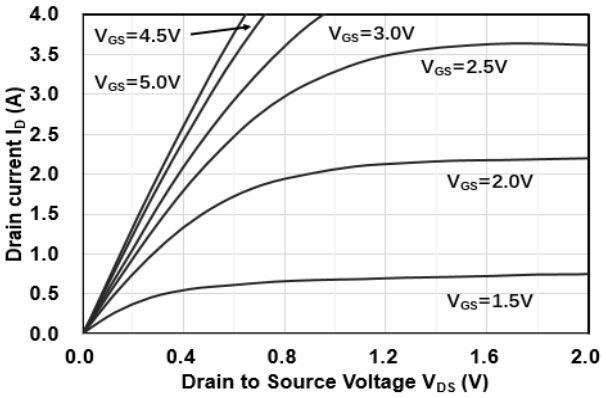


Figure1. Output Characteristics

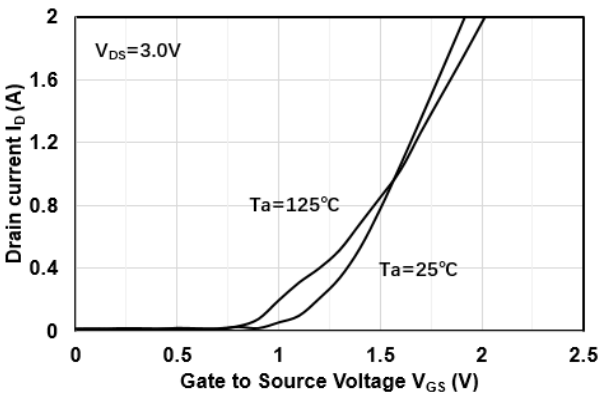


Figure2. Transfer Characteristics

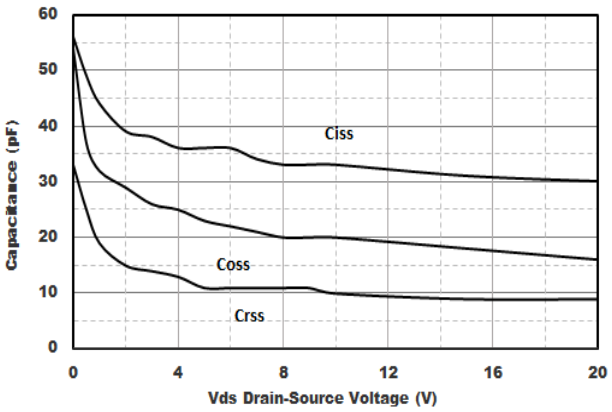


Figure3. Capacitance Characteristics

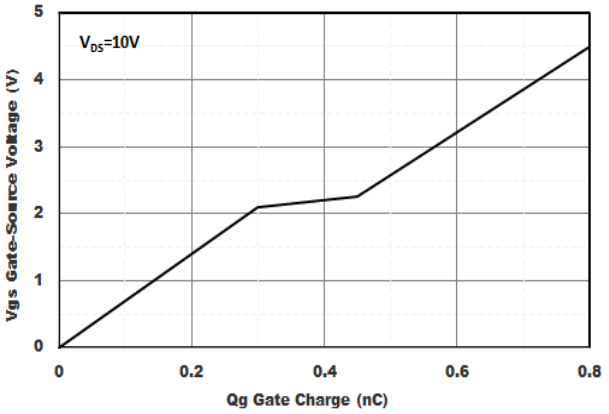


Figure4. Gate Charge

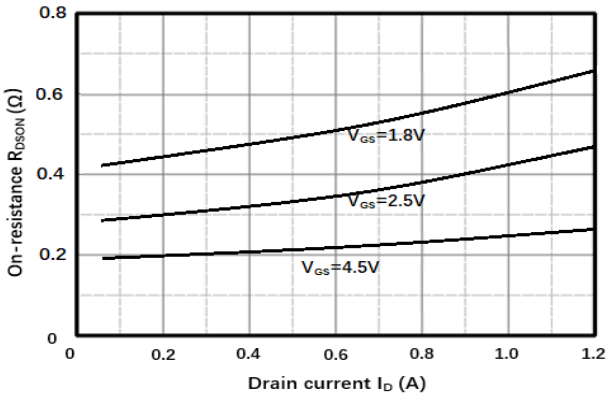


Figure5. Drain-Source on Resistance

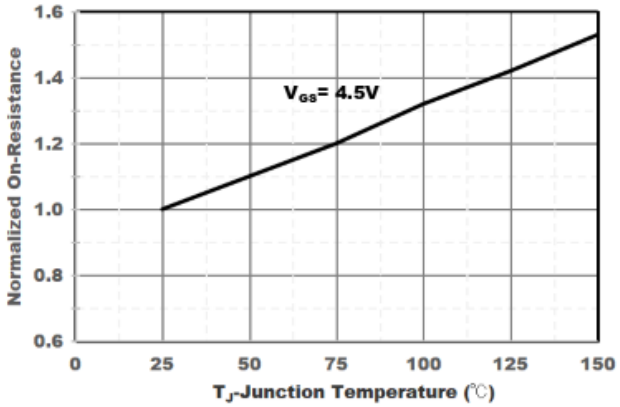


Figure6. Drain-Source on Resistance

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

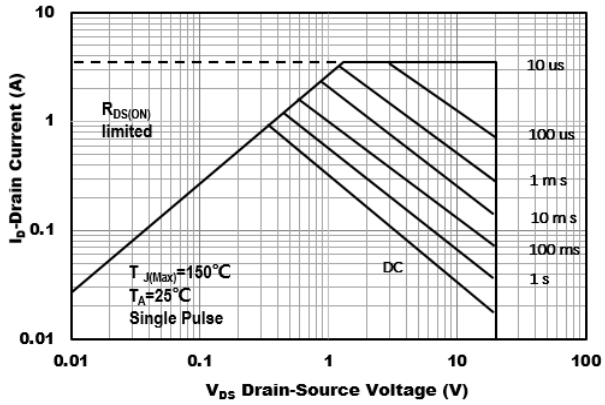


Figure7. Safe Operation Area

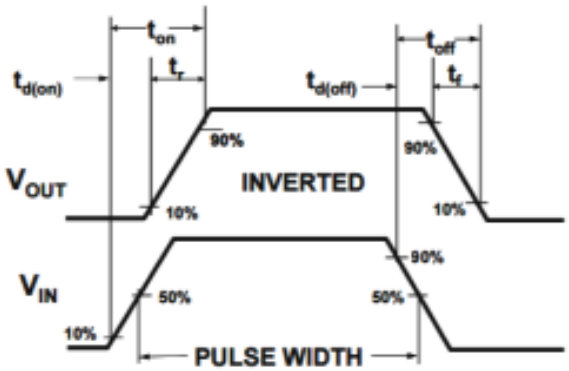
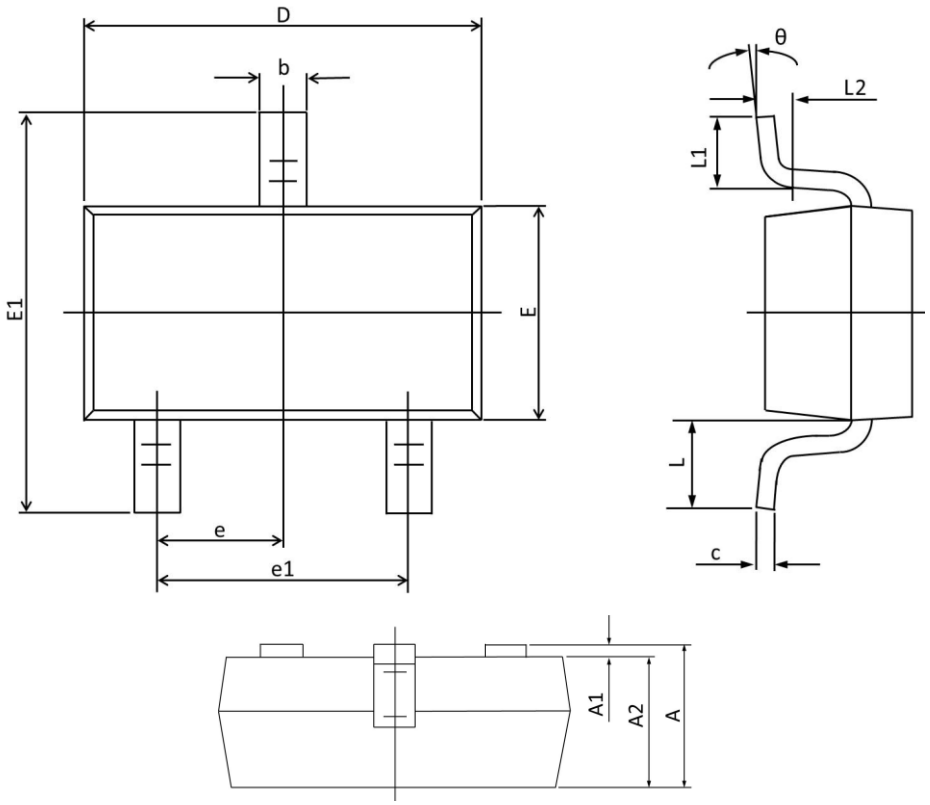


Figure8. Switching wave

SOT23 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Max	Min	Max	Min
A	1.150	0.900	0.045	0.035
A1	0.100	0.000	0.004	0.000
A2	1.050	0.900	0.041	0.035
b	0.500	0.300	0.020	0.012
c	0.150	0.080	0.006	0.003
D	3.000	2.800	0.118	0.110
E	1.400	1.200	0.055	0.047
E1	2.550	2.250	0.100	0.089
e	0.95 TYP.		0.037 TYP.	
e1	2.000	1.800	0.079	0.071
L	0.55 REF.		0.022 REF.	
L1	0.500	0.300	0.020	0.012
L2	0.25 TYP.		0.01 TYP.	
θ	8°	0°	8°	0°