



## Description

The HCJ3139K uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

## General Features

$V_{DS} = -20V$   $I_D = -0.66A$

$R_{DS(ON)} < 560\text{ m}\Omega @ V_{GS} = -4.5V$

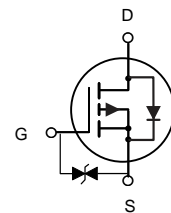
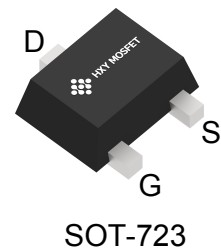
ESD Rating: 1500V HBM

## Application

Load/Power Switching

Interfacing Switching

Battery Management for Ultra Small Portable Electronics



P-Channel MOSFET

## Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HCJ3139K	SOT-723	KD	8000

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

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage	-20	V
$V_{GS}$	Gate-Source Voltage	$\pm 10$	V
$I_D$	Drain Current-Continuous	-0.66	A
$I_{DM}$	Drain Current-Pulsed (Note 1)	-1.2	A
$P_D$	Maximum Power Dissipation	0.15	W
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	850	$^\circ\text{C/W}$



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

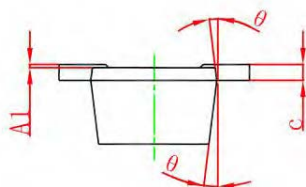
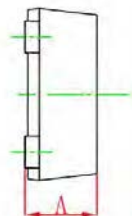
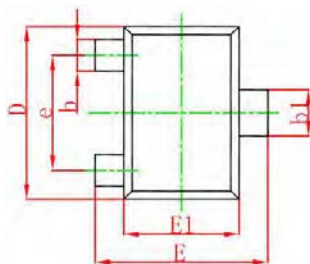
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = -20V, V_{GS} = 0V$			-1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 10V, V_{DS} = 0V$			$\pm 10$	$\mu A$
Gate threshold voltage (note2)	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.7	-1.0	V
Drain-source on-resistance (note2)	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -0.5A$			0.56	$\Omega$
		$V_{GS} = -2.5V, I_D = -0.2A$			0.78	$\Omega$
Maximum Continuous Drain to Source Diode Forward Current	$I_S$	--			-0.6	A
Maximum Pulsed Drain to Source Diode Forward Current	$I_{SM}$	--			-1.2	A
Diode forward voltage	$V_{SD}$	$I_S = -0.5A, V_{GS} = 0V$			-1.2	V
Input capacitance	$C_{iss}$	$V_{DS} = -16V, V_{GS} = 0V,$ $f = 1MHz$		115		pF
Output capacitance	$C_{oss}$			15		pF
Reverse transfer capacitance	$C_{rss}$			9		pF
Turn-on delay time (note3)	$t_{d(on)}$	$V_{GS} = -4.5V, V_{DS} = -10V,$ $I_D = -200mA, R_{GEN} = 10\Omega$		9		nS
Turn-on rise time (note3)	$t_r$			6		nS
Turn-off delay time (note3)	$t_{d(off)}$			33		nS
Turn-off fall time (note3)	$t_f$			22		nS

Notes:

1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse Width=300 $\mu s$ , Duty Cycle=2%.
3. Switching characteristics are independent of operating junction temperatures.
4. Guaranteed by design, not subject to producing.

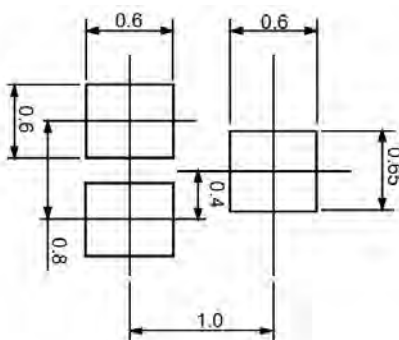


## SOT-723 Package Outline Dimensions



Symbol	Dimensions In Millimet	
	Min	Max
A	0.42	0.50
A1	0.00	0.05
b	0.16	0.28
b1	0.25	0.35
c	0.07	0.16
D	1.10	1.30
e	0.8TYP	
E	1.10	1.30
E1	0.75	0.85
θ	8°	10°

## Suggested Pad Layout (mm)





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