



## Description

The HDMG1013T7 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.



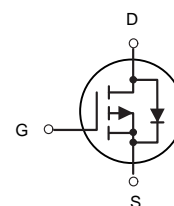
SOT-523

## General Features

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

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

$R_{DS(ON)} < 780\ m\Omega @ V_{GS} = -2.5V$



P-Channel MOSFET

## Application

Battery protection

Load switch

Uninterruptible power supply

## Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HDMG1013T7	SOT-523	39K	3000

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

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage	-20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D$	Drain Current-Continuous	-0.66	A
$P_D$	Maximum Power Dissipation	150	mW
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	833	$^\circ C/W$



## Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ , unless otherwise noted)

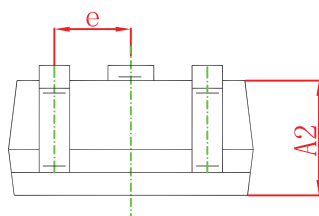
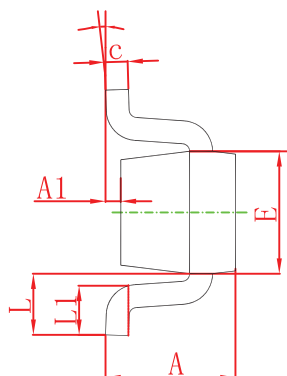
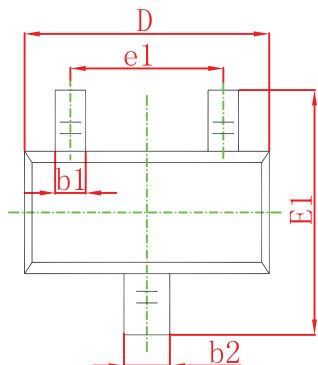
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
STATIC CHARACTERISTICE						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =-250μA	-20			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =-20V,V <sub>GS</sub> = 0V			-1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±10V, V <sub>DS</sub> = 0V			±10	μA
Gate threshold voltage <small>(note2)</small>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.4	-0.7	-1.0	V
Drain-source on-resistance <small>(note2)</small>	R <sub>DS(on)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-0.5A			0.56	Ω
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-0.2A			0.78	Ω
Maximum Continuous Drain to Source Diode Forward Current	I <sub>S</sub>	--			-0.6	A
Maximum Pulsed Drain to Source Diode Forward Current	I <sub>SM</sub>	--			-1.2	A
Diode forward voltage	V <sub>SD</sub>	I <sub>S</sub> =-0.5A, V <sub>GS</sub> = 0V			-1.2	V
DYNAMIC CHARACTERISTICS <small>(note4)</small>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-16V,V <sub>GS</sub> =0V, f =1MHz		115		pF
Output capacitance	C <sub>oss</sub>			15		pF
Reverse transfer capacitance	C <sub>rss</sub>			9		pF
SWITCHING CHARACTERISTICS <small>(note4)</small>						
Turn-on delay time <small>(note3)</small>	t <sub>d(on)</sub>	V <sub>GS</sub> =-4.5V,V <sub>DS</sub> =-10V, I <sub>D</sub> =-200mA,R <sub>GEN</sub> =10Ω		9		nS
Turn-on rise time <small>(note3)</small>	t <sub>r</sub>			6		nS
Turn-off delay time <small>(note3)</small>	t <sub>d(off)</sub>			33		nS
Turn-off fall time <small>(note3)</small>	t <sub>f</sub>			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.

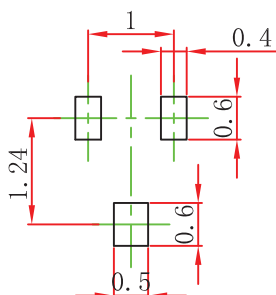


## SOT-523 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

## SOT-523 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.



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