



Description

The HI5102 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.

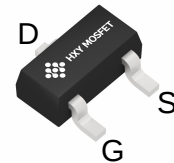
General Features

$V_{DS} = 20V$ $I_D = 6.0A$

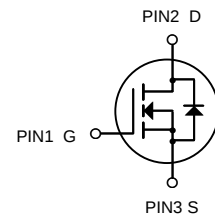
$R_{DS(ON)} < 27m\Omega @ V_{GS}=4.5V$

Application

Battery protection
Load switch
Uninterruptible power supply



SOT-23



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
HI5102	SOT-23	2300	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	± 12	V
I_D	Drain Current-Continuous	6	A
I_{DM}	Drain Current-Pulsed (Note 1)	25	A
P_D	Maximum Power Dissipation	0.35	W
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)	100	$^\circ C/W$



$T_a=25^{\circ}\text{C}$ unless otherwise specified

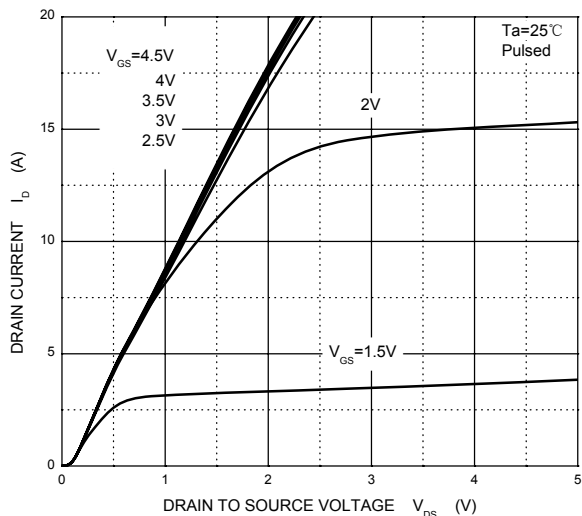
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Gate-source leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS}=16V, V_{GS}=0V$			1.0	μA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.7	1.0	V
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=5.0A$		22	27	m Ω
		$V_{GS}=2.5V, I_D=4.0A$		35	42	
		$V_{GS}=1.8V, I_D=2.0A$			73	
Diode forward voltage	V_{SD}	$V_{GS}=0V, I_S=1A$		0.75	1	V
Forward transconductance	g_{fs}	$V_{DS}=5V, I_D=3.8A$	4			S
DYNAMIC PARAMETERS*						
Input capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		630		pF
Output capacitance	C_{oss}			164		
Reverse transfer capacitance	C_{rss}			137		
Gate resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1MHz$		1.5		Ω
SWITCHING PARAMETERS*						
Turn-on delay time	$t_{d(on)}$	$V_{GS}=5V, V_{DS}=10V,$ $R_L=1.7\Omega, R_{GEN}=6\Omega$		5.5		ns
Rise time	t_r			14		
Turn-off delay time	$t_{d(off)}$			29		
Fall time	t_f			10.2		

*These parameters have no way to verify.

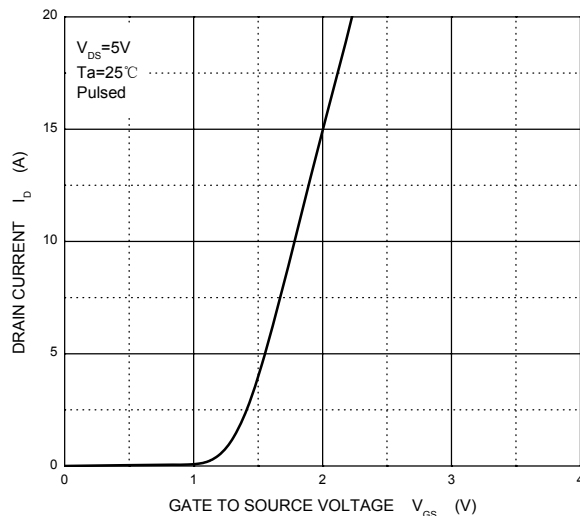


Typical Characteristics

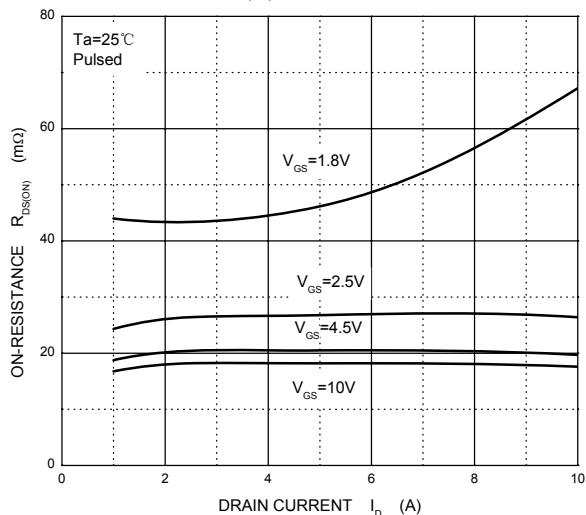
Output Characteristics



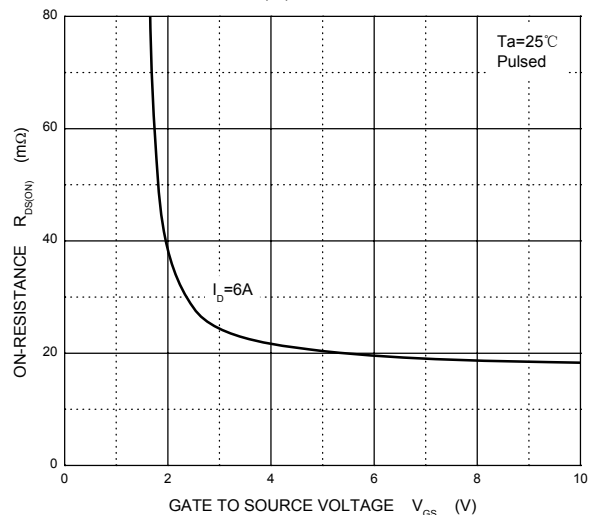
Transfer Characteristics



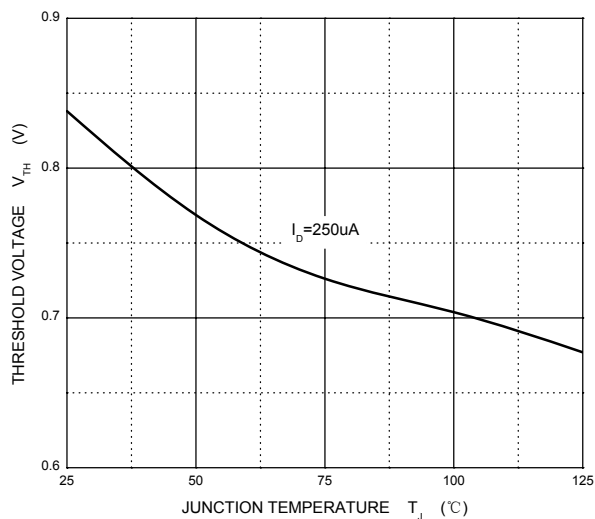
$R_{DS(ON)}$ — I_D



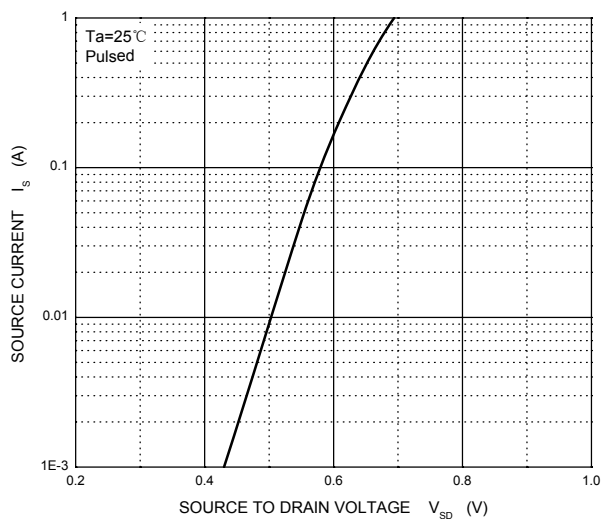
$R_{DS(ON)}$ — V_{GS}



Threshold Voltage

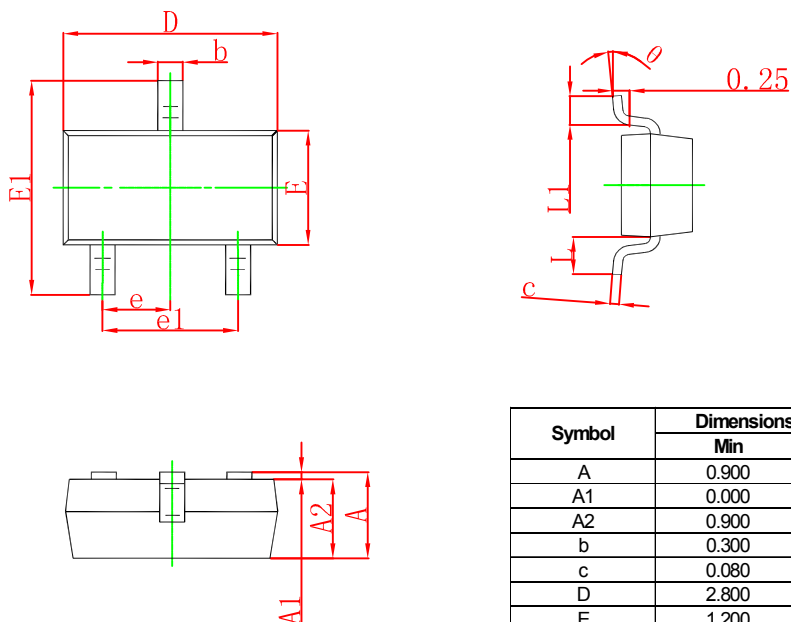


I_S — V_{SD}



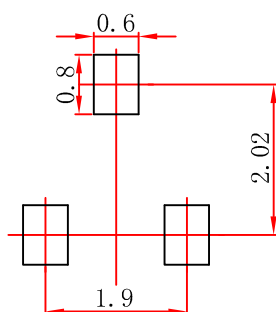


SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 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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