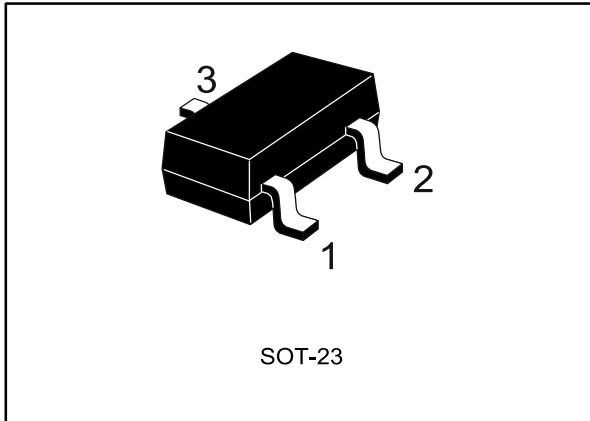
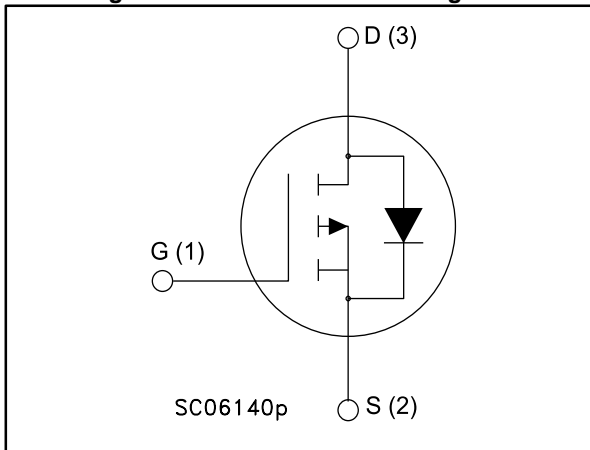


## P-channel 30 V, 0.048 $\Omega$ typ., 2 A STripFET™ H6 Power MOSFET in a SOT-23 package

Datasheet - production data



**Figure 1: Internal schematic diagram**



### Features

Order code	V <sub>DS</sub>	R <sub>DS(on)</sub> max	I <sub>D</sub>
STR2P3LLH6	30 V	0.056 $\Omega$ @ 10 V	2 A

- Very low on-resistance
- Very low gate charge
- High avalanche ruggedness
- Low gate drive power loss

### Applications


- Switching applications

### Description

This device is a P-channel Power MOSFET developed using the STripFET™ H6 technology, with a new trench gate structure. The resulting Power MOSFET exhibits very low R<sub>DS(on)</sub> in all packages.

**Table 1: Device summary**

Order codes	Marking	Package	Packaging
STR2P3LLH6	2K3L	SOT-23	Tape and reel

-  For the P-channel MOSFET the actual polarity of the voltages and the current must be reversed.

---

## Contents

<b>1</b>	<b>Electrical ratings .....</b>	<b>3</b>
<b>2</b>	<b>Electrical characteristics .....</b>	<b>4</b>
	2.1 Electrical characteristics (curves).....	6
<b>3</b>	<b>Test circuits .....</b>	<b>8</b>
<b>4</b>	<b>Package mechanical data .....</b>	<b>9</b>
	4.1 SOT-23 .....	9
<b>5</b>	<b>Revision history .....</b>	<b>11</b>

# 1 Electrical ratings

**Table 2: Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_{DS}$	Drain-source voltage	30	V
$V_{GS}$	Gate-source voltage	$\pm 20$	V
$I_D$	Drain current (continuous) at $T_{pcb} = 25\text{ }^{\circ}\text{C}$	2	A
$I_D$	Drain current (continuous) at $T_{pcb} = 100\text{ }^{\circ}\text{C}$	1.2	A
$I_{DM}^{(1)}$	Drain current (pulsed)	8	A
$P_{TOT}$	Total dissipation at $T_{pcb} = 25\text{ }^{\circ}\text{C}$	0.35	W
$T_J$	Operating junction temperature	150	$^{\circ}\text{C}$
$T_{stg}$	Storage temperature	-55 to 150	$^{\circ}\text{C}$

**Notes:**

<sup>(1)</sup>Pulse width limited by safe operating area

**Table 3: Thermal resistance**

Symbol	Parameter	Value	Unit
$R_{thj-pcb}^{(1)}$	Thermal resistance junction-pcb, single operation	357	$^{\circ}\text{C}/\text{W}$

**Notes:**

<sup>(1)</sup>When mounted on FR-4 board of 1inch<sup>2</sup>, 2oz Cu,  $t < 10\text{ sec}$



For the P-channel MOSFET the actual polarity of the voltages and the current must be reversed.

## 2 Electrical characteristics

( $T_C = 25\text{ °C}$  unless otherwise specified)

**Table 4: On /off states**

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage	$V_{GS} = 0, I_D = 250\text{ }\mu\text{A}$	30			V
$I_{DSS}$	Zero gate voltage drain current	$V_{GS} = 0,$ $V_{DS} = 30\text{ V}, T_J = 125\text{ °C}$			1	$\mu\text{A}$
$I_{GSS}$	Gate body leakage current	$V_{GS} = 0, V_{GS} = \pm 20\text{ V}$			100	nA
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1		2.5	V
$R_{DS(on)}$	Static drain-source on-resistance	$V_{GS} = 10\text{ V}, I_D = 1\text{ A}$ $V_{GS} = 4.5\text{ V}, I_D = 1\text{ A}$		0.048 0.075	0.056 0.09	$\Omega$

**Table 5: Dynamic**

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
$C_{iss}$	Input capacitance	$V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ $V_{GS} = 0$	-	639	-	pF
$C_{oss}$	Output capacitance		-	79	-	
$C_{riss}$	Reverse transfer capacitance		-	52	-	
$Q_g$	Total gate charge	$V_{DD} = 15\text{ V}, I_D = 2\text{ A}$ $V_{GS} = 4.5\text{ V}$	-	6	-	nC
$Q_{gs}$	Gate-source charge		-	1.9	-	
$Q_{gd}$	Gate-drain charge		-	2.1	-	

**Table 6: Switching times**

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-on delay time	$V_{DD} = 15\text{ V}, I_D = 2\text{ A},$ $R_G = 4.7\text{ }\Omega, V_{GS} = 10\text{ V}$	-	5.4	-	ns
$t_r$	Rise time		-	5	-	
$t_{d(off)}$	Turn-off delay time		-	19.2	-	
$t_f$	Fall time		-	3.4	-	

Table 7: Source drain diode

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
$V_{SD}^{(1)}$	Forward on voltage	$I_{SD} = 2 \text{ A}$ , $V_{GS} = 0$	-	-	1.1	V
$t_{rr}$	Reverse recovery time	$I_{SD} = 2 \text{ A}$ , $di/dt = 100 \text{ A}/\mu\text{s}$ , $V_{DD} = 24 \text{ V}$ , $T_J = 150 \text{ }^\circ\text{C}$	-	-	11.2	ns
$Q_{rr}$	Reverse recovery charge		-	-	3.5	nC
$I_{RRM}$	Reverse recovery current		-	-	0.6	A

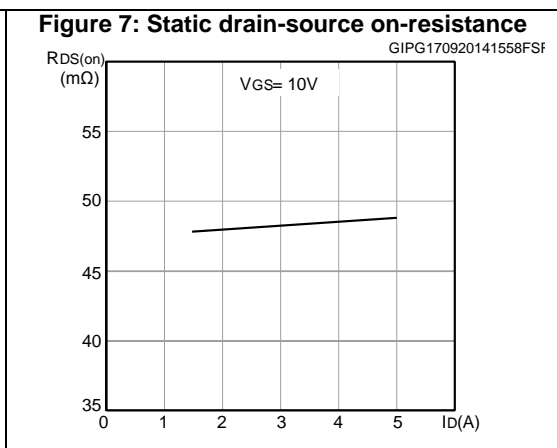
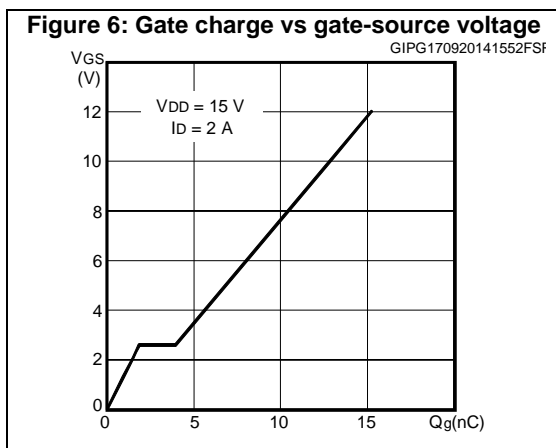
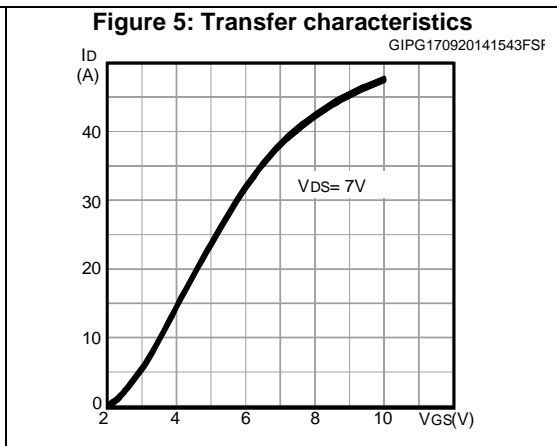
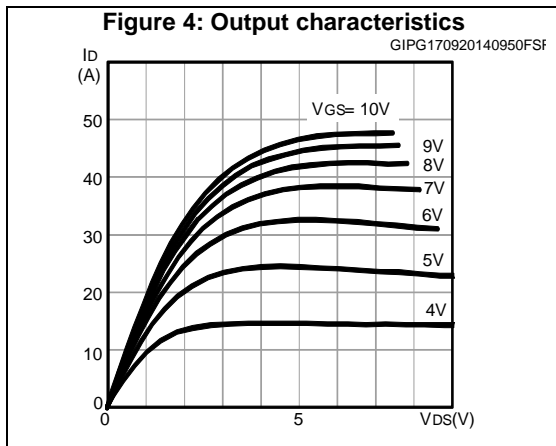
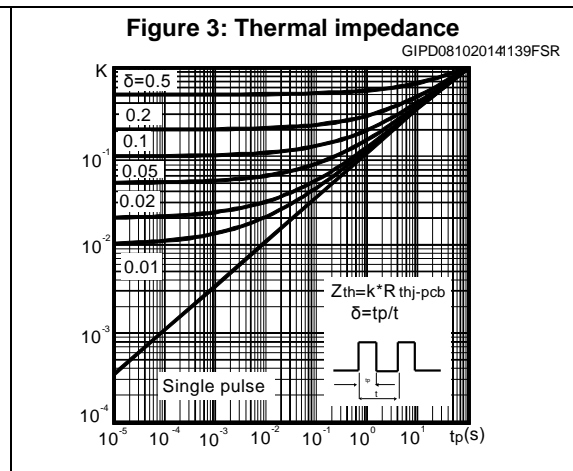
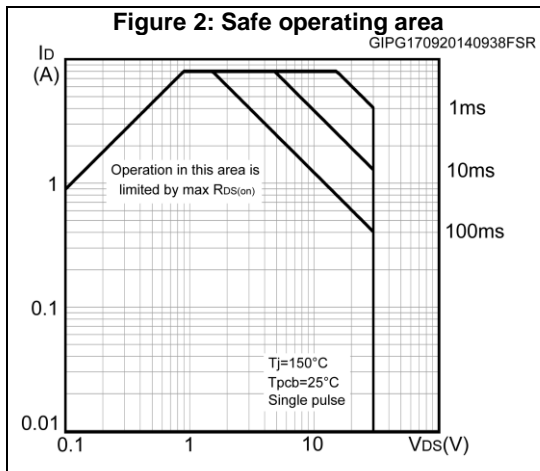
**Notes:**

<sup>(1)</sup>Pulsed: pulse duration=300 $\mu$ s, duty cycle 1.5%

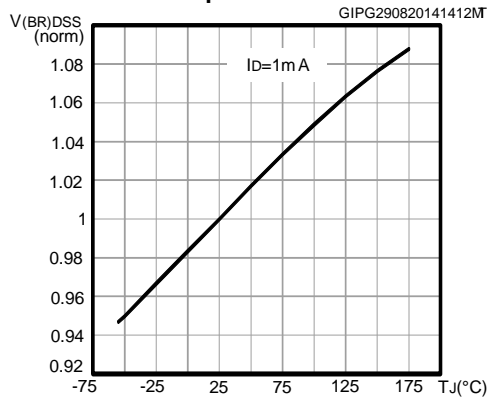


For the P-channel MOSFET the actual polarity of the voltages and the current must be reversed.

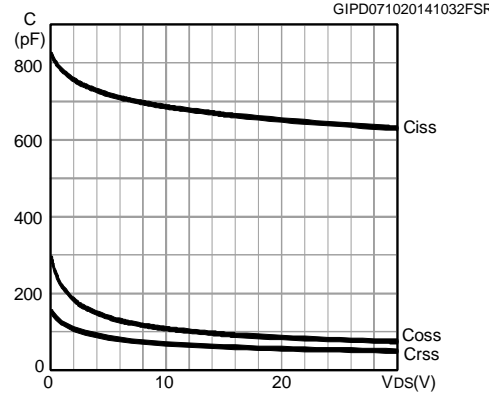
## 2.1 Electrical characteristics (curves)



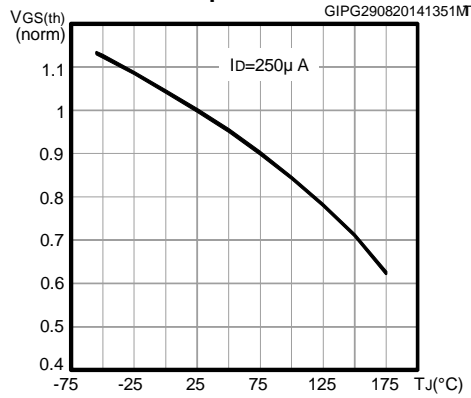
**Figure 8: Normalized V(BR)DSS vs temperature**



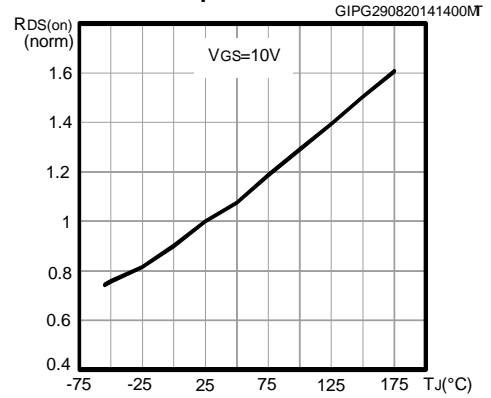
**Figure 9: Capacitance variations**



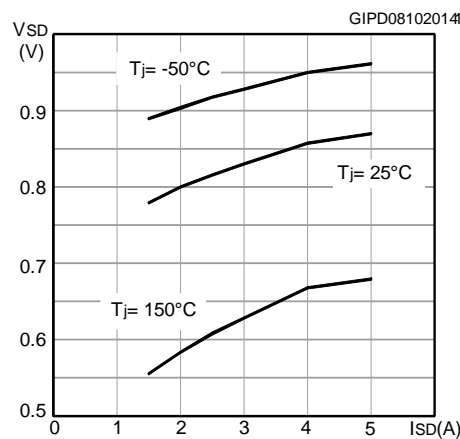
**Figure 10: Normalized gate threshold voltage vs. temperature**



**Figure 11: Normalized on-resistance vs. temperature**

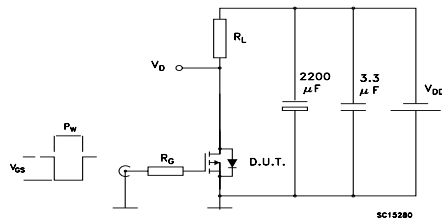


**Figure 12: Source-drain diode forward characteristics**

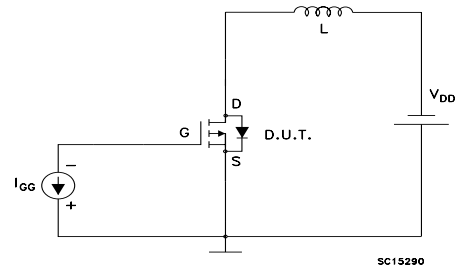


### 3 Test circuits

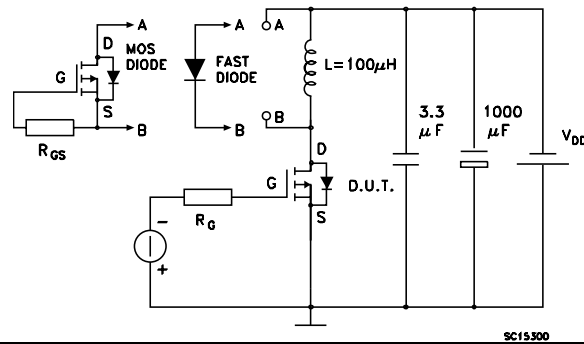
**Figure 13: Switching times test circuit for resistive load**



**Figure 14: Gate charge test circuit**



**Figure 15: Test circuit for inductive load switching and diode recovery times**





## 4 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK® is an ST trademark.

### 4.1 SOT-23

Figure 16: SOT-23 mechanical drawing

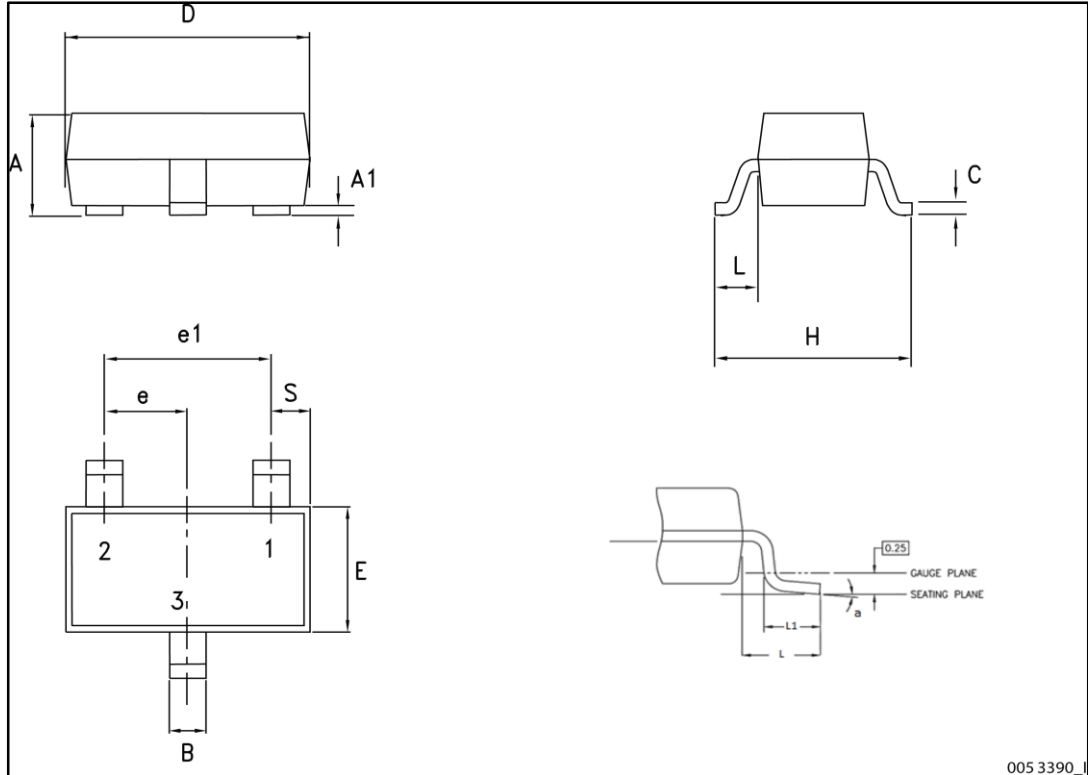
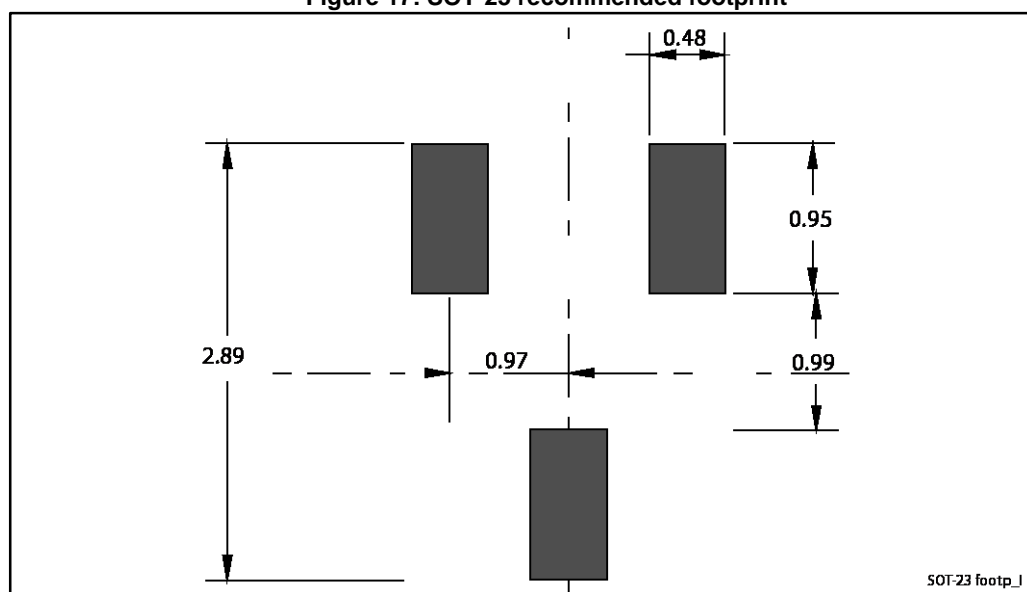


Table 8: SOT-23 mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	0.89		1.40
A1	0		0.10
B	0.30		0.51
C	0.085		0.18
D	2.75		3.04
e	0.85		1.05
e1	1.70		2.10
E	1.20		1.75
H	2.10		3.00
L		0.60	
S	0.35		0.65
L1	0.25		0.55
a	0°		8°

Figure 17: SOT-23 recommended footprint



Dimensions are in mm.

## 5 Revision history

**Table 9: Document revision history**

Date	Revision	Changes
09-May-2013	1	Initial release.
03-Nov-2014	2	Document status promoted from preliminary to production data. Added <a href="#">Section 2.1: "Electrical characteristics (curves)"</a> . Minor text changes.

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