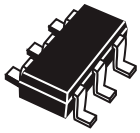
STT3P2UH7

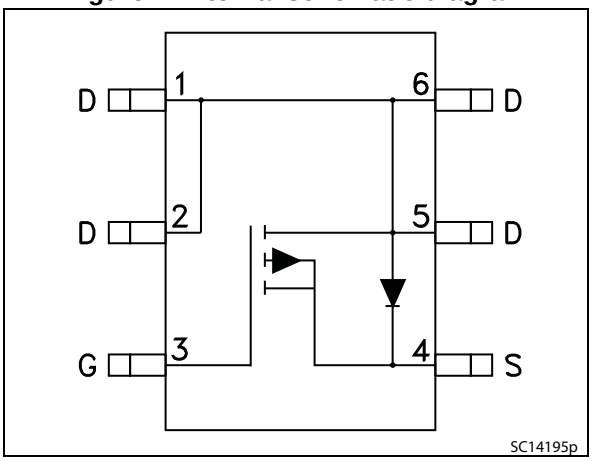
P-channel 20 V, 0.075 Ω typ., 3 A STripFET™ VII DeepGATE™ Power MOSFET in a SOT23-6L package

Datasheet – target specification



SOT23-6L

Figure 1. Internal schematic diagram



Features

Order code	V_{DS}	$R_{DS(on)}$ max	I_D
STT3P2UH7	20 V	0.1 Ω @ 4.5 V	3 A

- Ultra logic level
- Extremely low on-resistance $R_{DS(on)}$

Applications

- Switching applications

Description

This device exhibits low on-state resistance and capacitance for improved conduction and switching performance.

Table 1. Device summary

Order code	Marking	Package	Packaging
STT3P2UH7	3L2U	SOT23-6L	Tape and reel

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

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1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage	30	V
V_{GS}	Gate-source voltage	± 8	V
I_D (1)	Drain current (continuous) at T_C = 25 °C	3	A
I_D (1)	Drain current (continuous) at T_C = 100 °C	1.9	A
I_{DM}(1)(2)	Drain current (pulsed)	12	A
P_{TOT}(1)	Total dissipation at T_C = 25 °C	1.6	W
T_{stg}	Storage temperature	- 55 to 150	°C
T_j	Max. operating junction temperature	150	°C

1. The value is rated according to $R_{thj\text{-}pcb}$
2. Pulse width limited by safe operating area

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj\text{-}pcb}$(1)	Thermal resistance junction-pcb max, single operation	78	°C/W

1. When mounted on 1inch² FR-4 board, 2 oz Cu

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

2 Electrical characteristics

(T_C = 25 °C unless otherwise specified)

Table 4. On /off states

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage	I_D = 250 µA, V_{GS} = 0	20			V
I_{DSS}	Zero gate voltage drain current	V_{DS} = 20 V, V_{GS} = 0			1	µA
I_{GSS}	Gate-body leakage current	V_{GS} = ± 8 V, V_{DS} = 0			10	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS} = V_{GS}, I_D = 250 µA	0.4		1	V
$R_{DS(on)}$	Static drain-source on-resistance	V_{GS}= 4.5 V, I_D = 1.5 A		0.075	0.1	Ω
		V_{GS}= 2.5 V, I_D = 1.5 A		0.1	0.135	Ω
		V_{GS}= 1.8 V, I_D = 1.5 A		0.15	0.2	Ω

Table 5. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input capacitance	V_{DS} = 15 V, f = 1 MHz, V_{GS} = 0	-	530	-	pF
C_{oss}	Output capacitance		-	90	-	pF
C_{rss}	Reverse transfer capacitance		-	50	-	pF
Q_g	Total gate charge	V_{DD} = 15 V, I_D = 3 A, V_{GS} = 4.5 V (see *Figure 3*)	-	5.5	-	nC
Q_{gs}	Gate-source charge		-	1	-	nC
Q_{gd}	Gate-drain charge		-	1.5	-	nC

Table 6. Switching times

Symbol	Parameter	Test conditions	Min.	Typ.	Max	Unit
$t_{d(on)}$	Turn-on delay time	V_{DD} = 15 V, I_D = 3 A, R_G = 1 Ω, V_{GS} = 4.5 V (see *Figure 4*)	-	5	-	ns
t_r	Rise time		-	13	-	ns
$t_{d(off)}$	Turn-off delay time		-	13	-	ns
t_f	Fall time		-	20	-	ns

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

Table 7. Source drain diode

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain current		-	-	3	A
I_{SDM} (1)	Source-drain current (pulsed)		-	-	12	A
V_{SD} (2)	Forward on voltage	I_{SD} = 1 A, V_{GS} = 0	-	-	1	V
t_{rr}	Reverse recovery time	V_{DD} = 16 V di/dt = 100 A/µs, I_{SD} = 1 A T_j=150 °C (see *Figure 4*)	-	15		ns
Q_{rr}	Reverse recovery charge		-	5		nC
I_{RRM}	Reverse recovery current		-	0.7		A

1. Pulse width limited by safe operating area.
2. Pulsed: pulse duration = 300 µs, duty cycle 1.5%

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

3 Test circuits

Figure 2. Switching times test circuit for resistive load

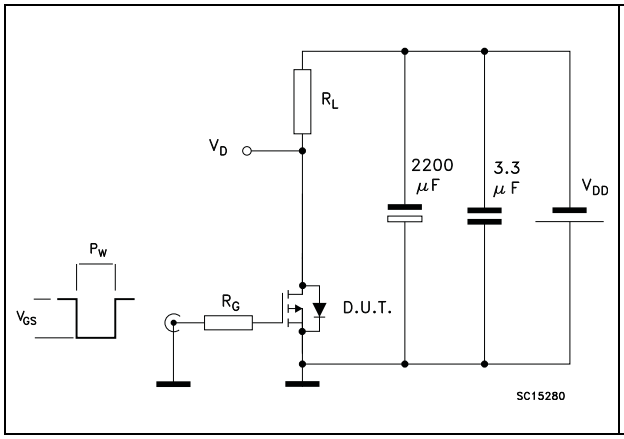


Figure 3. Gate charge test circuit

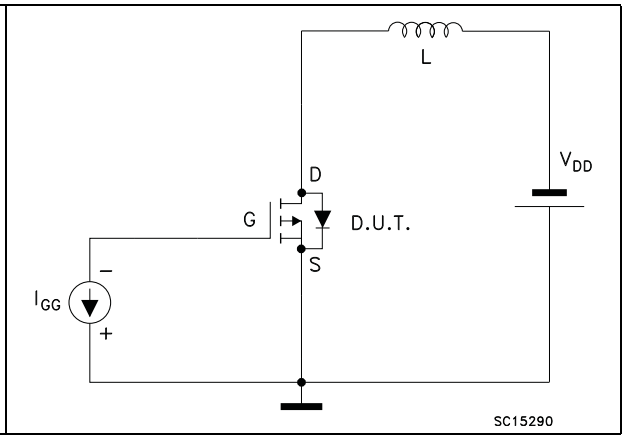
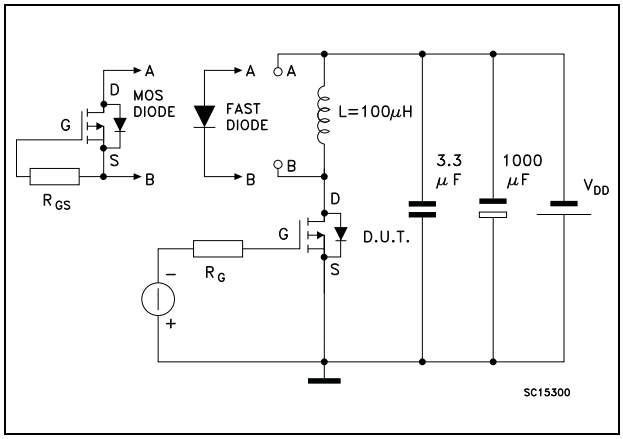


Figure 4. Test circuit for inductive load switching and diode recovery times



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*. ECOPACK® is an ST trademark.

Table 8. SOT23-6L package mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	0.90		1.45
A1	0.00		0.15
A2	0.90		1.30
b	0.30		0.50
C	0.09		0.20
D	2.80		3.05
E	1.50		1.75
e		0.95	
H	2.60		3.00
L	0.30		0.60
ϕ	0°		10°

Figure 5. SOT23-6L package drawing

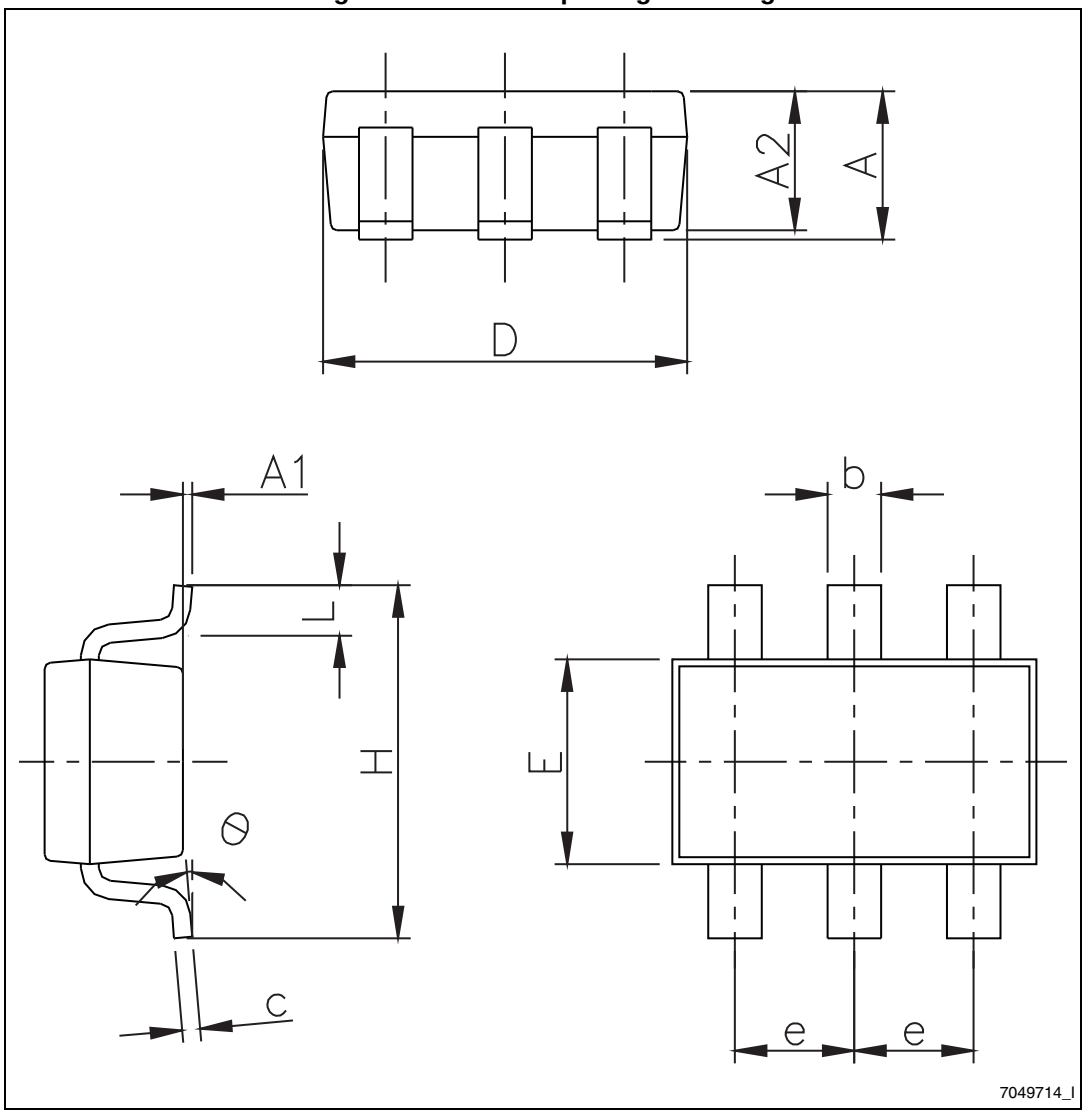
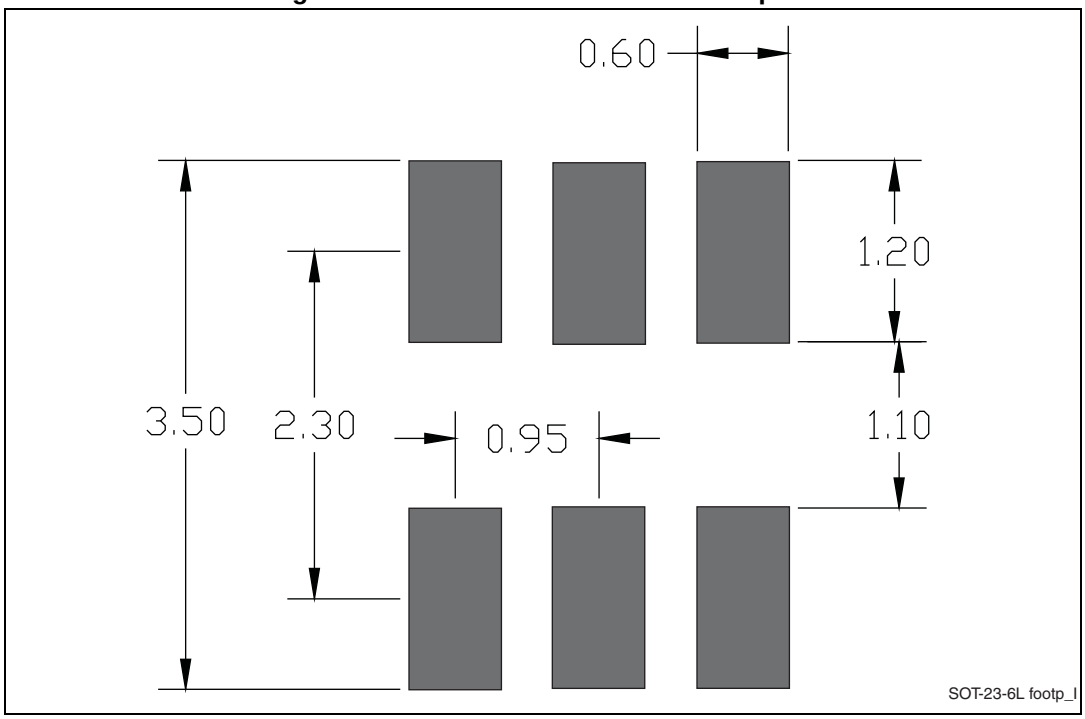


Figure 6. SOT23-6L recommended footprint



5 Revision history

Table 9. Document revision history

Date	Revision	Changes
22-Jul-2013	1	First release.

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