



STS10PF30L

P-CHANNEL 30V - 0.012 Ω - 10A SO-8 STripFET™ II POWER MOSFET

Table 1: General Features

TYPE	V _{DSS}	R _{DS(on)}	I _D
STS10PF30L	30V	<0.014 Ω	10 A

- TYPICAL R_{DS(on)} = 0.012 Ω
- STANDARD OUTLINE FOR EASY AUTOMATED SURFACE MOUNT ASSEMBLY
- LOW THRESHOLD DRIVE

DESCRIPTION

This Power MOSFET is the latest development of STMicroelectronics unique "Single Feature Size™" strip-based process. The resulting transistor shows extremely high packing density for low on-resistance.

APPLICATIONS

- BATTERY MANAGEMENT IN NOMADIC EQUIPMENT
- LOAD SWITCH

Figure 1: Package

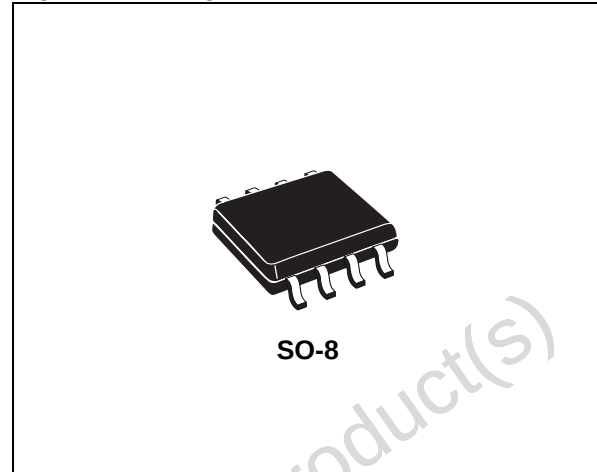


Figure 2: Internal Schematic Diagram

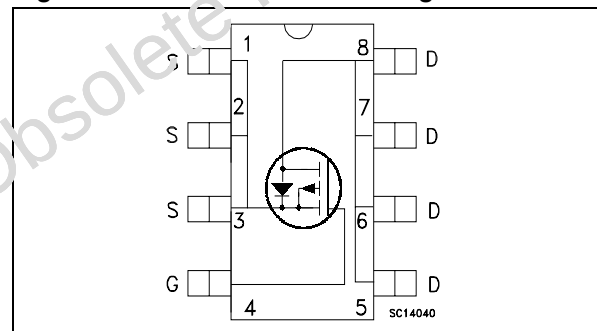


Table 2: Order Codes

SALES TYPE	MARKING	PACKAGE	PACKAGING
STS10PF30L	S10PF30L	SO-8	TAPE & REEL

Table 3: ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Unit
V _{DS}	Drain-source Voltage (V _{GS} = 0)	30	V
V _{DGR}	Drain-gate Voltage (R _{GS} = 20 k Ω)	30	V
V _{GS}	Gate- source Voltage	± 16	V
I _D	Drain Current (continuous) at T _C = 25°C	10	A
I _D	Drain Current (continuous) at T _C = 100°C	6	A
I _{DM} (•)	Drain Current (pulsed)	40	A
P _{tot}	Total Dissipation at T _C = 25°C	2.5	W

Note: For the P-CHANNEL MOSFET actual polarity of voltages and current has to be reversed

STS10PF30L

Table 4: THERMAL DATA

R _{thj-amb}	(*) Thermal Resistance Junction-ambient	Max	47	°C/W
R _{thj-lead}	Thermal Resistance Junction-leads	Max	16	°C/W
T _l	Maximum Lead Temperature For Soldering Purpose	Typ	150	°C
T _{stg}	storage temperature		-55 to 150	°C

(*) When Mounted on 1 inch² FR-4 board, 2 oz of Cu and t ≤ 10 sec.

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Table 5: OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{(BR)DSS}	Drain-source Breakdown Voltage	I _D = 250 μA, V _{GS} = 0	30			V
I _{DSS}	Zero Gate Voltage Drain Current (V _{GS} = 0)	V _{DS} = Max Rating V _{DS} = Max Rating T _C = 125°C			1 10	μA μA
I _{GSS}	Gate-body Leakage Current (V _{DS} = 0)	V _{GS} = ± 16 V			±100	nA

Table 6: ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} I _D = 250 μA	1			V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} = 10 V I _D = 5 A V _{GS} = 4.5 V I _D = 5 A		0.012 0.015	0.014 0.018	Ω Ω

Table 7: DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g _{fs}	Forward Transconductance	V _{DS} = 10 V I _D = 5 A		31		S
C _{iss} C _{oss} C _{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V _{DS} = 25V, f = 1 MHz, V _{GS} = 0		2300 750 115		pF pF pF

ELECTRICAL CHARACTERISTICS (continued)**Table 8: SWITCHING ON**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on Delay Time Rise Time	$V_{DD} = 15\text{ V}$ $I_D = 5\text{ A}$ $R_G = 4.7\ \Omega$ $V_{GS} = 4.5\text{ V}$ (Resistive Load, Figure 15)		72 87		ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	$V_{DD} = 15\text{ V}$ $I_D = 10\text{ A}$ $V_{GS} = 4.5\text{ V}$ (see test circuit, Figure 16)		29 6.8 7.6	39	nC nC nC

Table 9: SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$ t_f	Turn-off Delay Time Fall Time	$V_{DD} = 15\text{ V}$ $I_D = 5\text{ A}$ $R_G = 4.7\ \Omega$, $V_{GS} = 4.5\text{ V}$ (Resistive Load, Figure 15)		89 27		ns ns

Table 10: SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM}	Source-drain Current Source-drain Current (pulsed)				10 40	A A
$V_{SD}^{(*)}$	Forward On Voltage	$I_{SD} = 10\text{ A}$ $V_{GS} = 0$			1.2	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	$I_{SD} = 10\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$ $V_{DD} = 15\text{ V}$ $T_j = 150^\circ\text{C}$ (see test circuit, Figure 17)		48.5 68 2.8		ns nC A

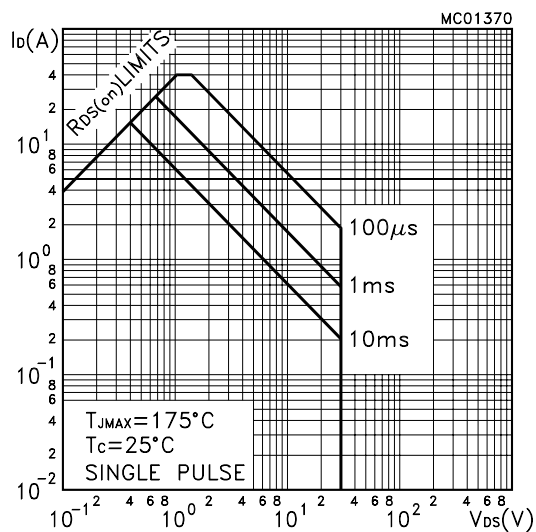
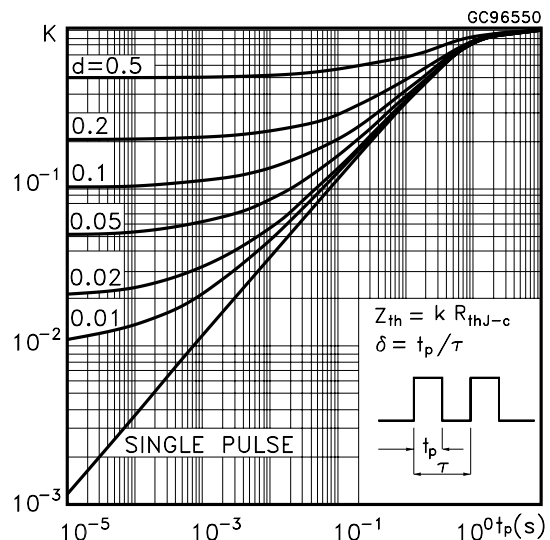
(*) Pulse width $\leq 300\ \mu\text{s}$, duty cycle 1.5 %.(*) Pulse width limited by T_{JMAX} **Figure 3: Safe Operating Area****Figure 4: Thermal Impedance**

Figure 5: Output Characteristics

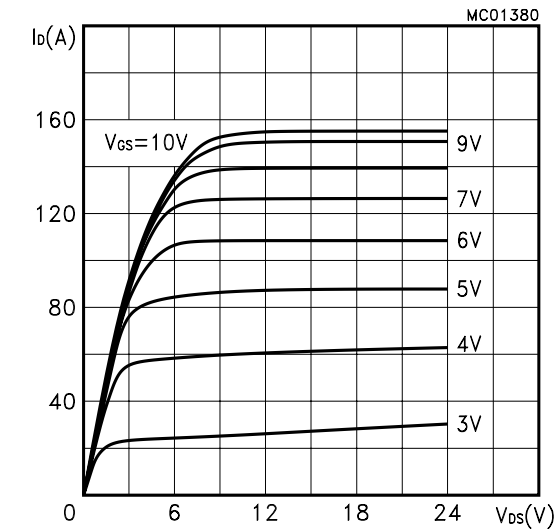


Figure 6: Transfer Characteristics

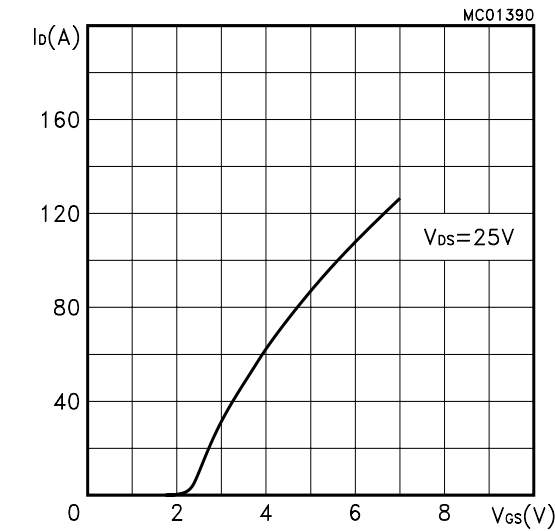


Figure 7: Transconductance

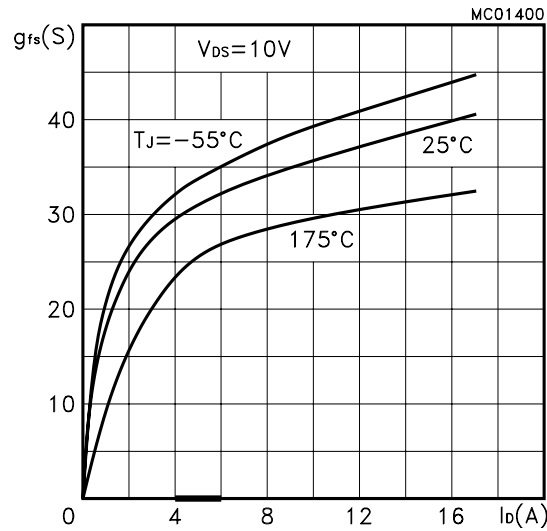


Figure 8: Static Drain-source On Resistance

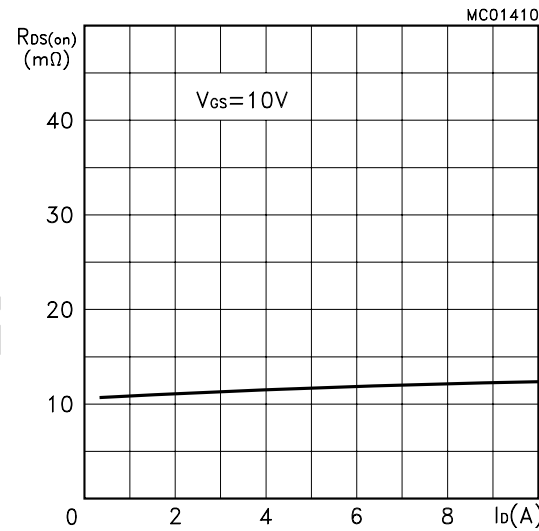


Figure 9: Gate Charge vs Gate-source Voltage

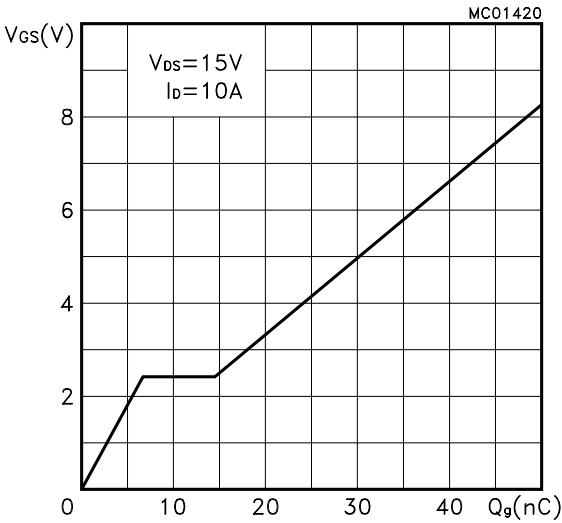


Figure 10: Capacitance Variations

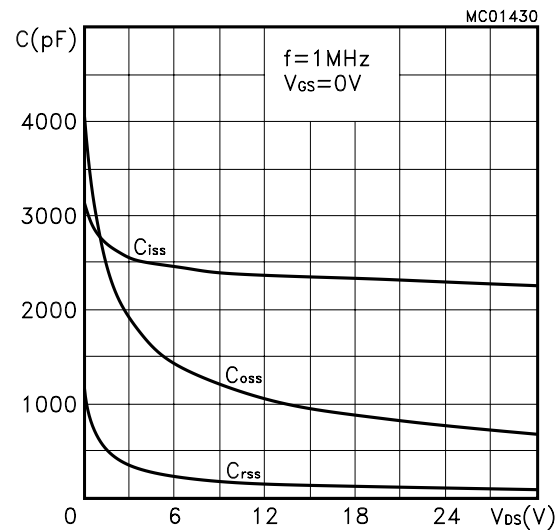


Figure 11: Normalized Gate Threshold Voltage vs Temperature

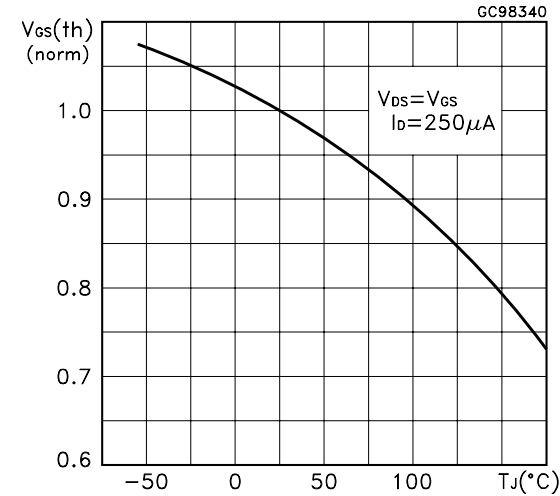


Figure 12: Normalized on Resistance vs Temperature

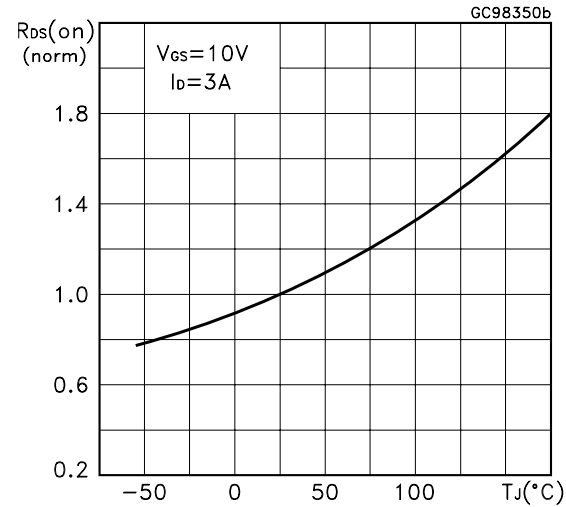


Figure 13: Source-drain Diode Forward Characteristics

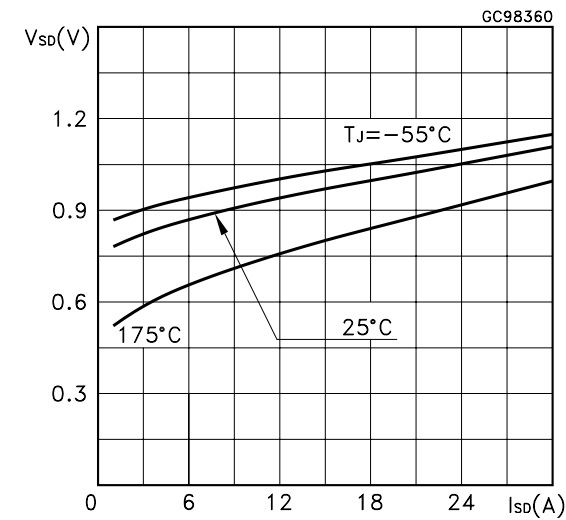


Figure 14: Normalized Breakdown Voltage vs Temperature.

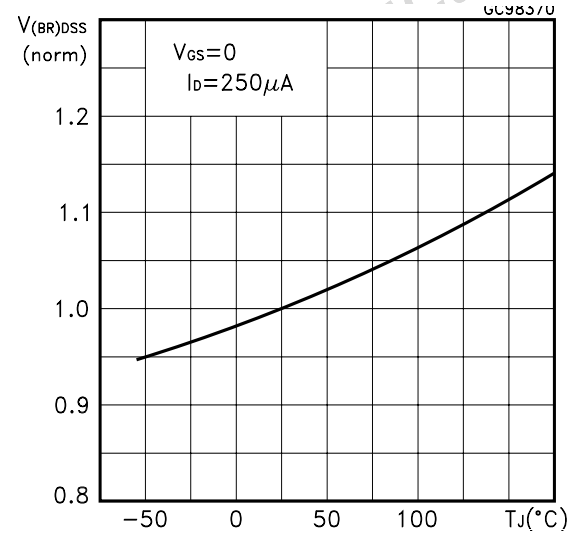


Fig. 15: Switching Times Test Circuits For Resistive Load

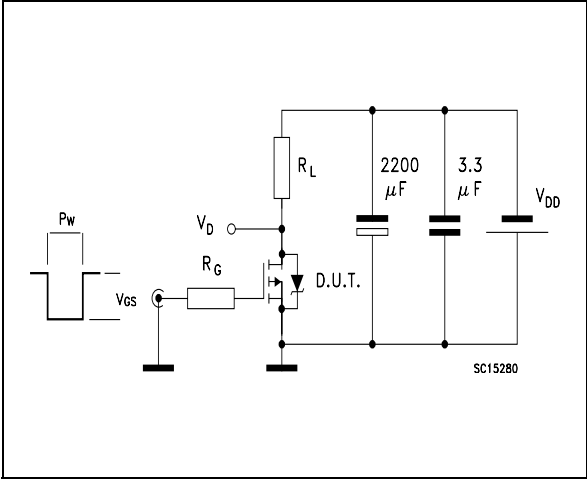


Fig. 16: Gate Charge test Circuit

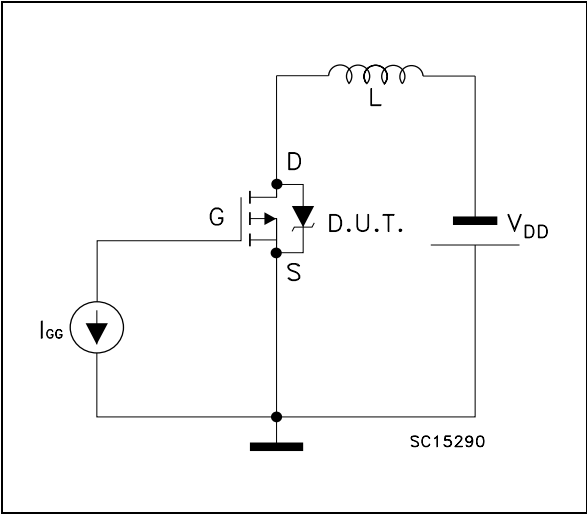
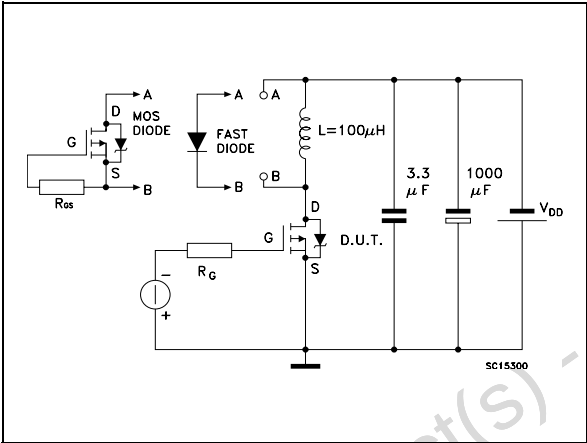


Fig. 17: Test Circuit For Diode Recovery Behaviour



SO-8 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.25	0.003		0.009
a2			1.65			0.064
a3	0.65		0.85	0.025		0.033
b	0.35		0.48	0.013		0.018
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.019
c1	45 (typ.)					
D	4.8		5.0	0.188		0.196
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.14		0.157
L	0.4		1.27	0.015		0.050
M			0.6			0.023
S	8 (max.)					

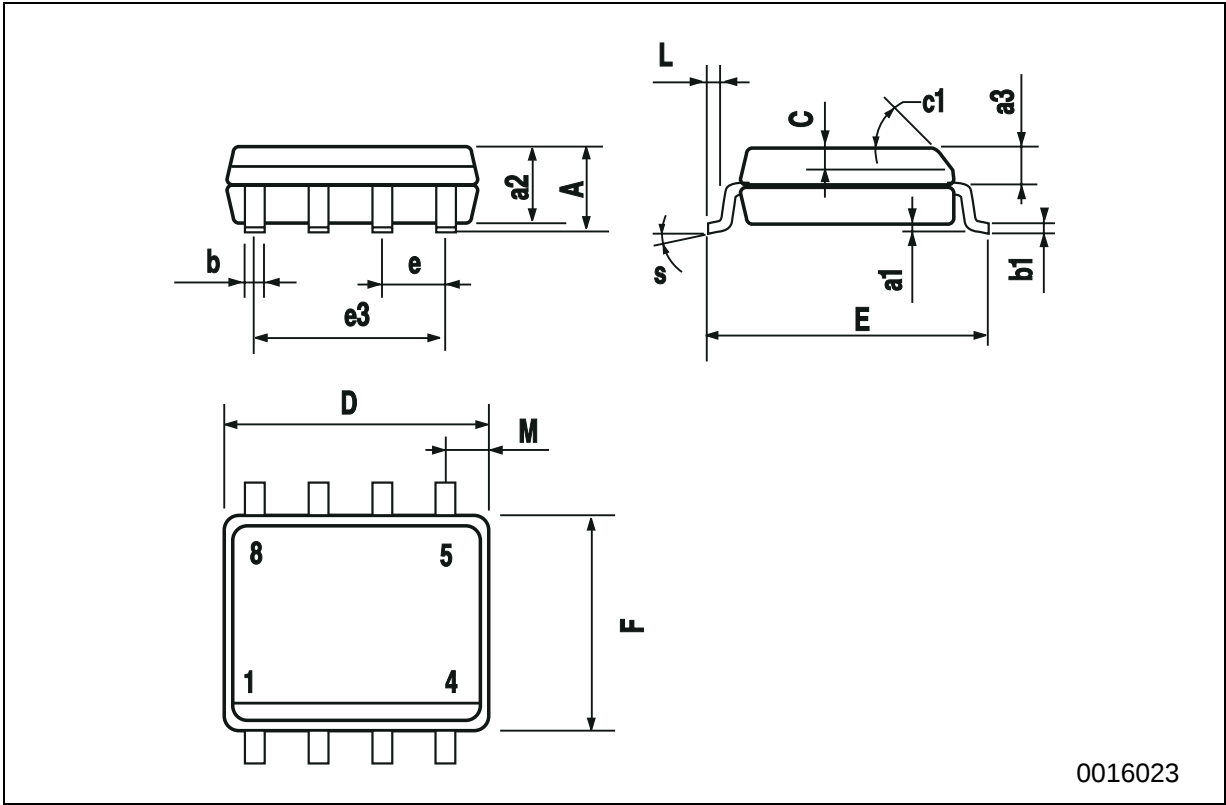


Table 11:Revision History

Date	Revision	Description of Changes
May 2005	2.0	completed whit curves

Obsolete Product(s) - Obsolete Product(s)

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is registered trademark of STMicroelectronics
All other names are the property of their respective owners.

© 2005 STMicroelectronics - All Rights Reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan -
Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America.

www.st.com

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[STMicroelectronics:](#)

[STS10PF30L](#)