



Is Now Part of



ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at
www.onsemi.com

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

FAN73611

单通道高侧栅极驱动 IC

特性

- 浮动通道可实现高达 +600 V 的自举运行
- 250 mA/500 mA 的典型源电流 / 灌电流驱动能力
- 共模 dv/dt 噪声消除电路
- 3.3 兼容 V 和 5 V 输入逻辑
- 输出与输入信号同相
- V_{DD} 和 V_{BS} 欠压锁定
- 8- 引脚小尺寸封装 (SOP)

应用

- 电子镇流器
- 开关电源 SMPS

相关应用说明

- [AN-6076 — 高压栅极驱动 IC 自举电路的设计与应用指南](#)
- [AN-9052 — 自举元件选择的设计指南](#)
- [AN-8102 — 避免 HVIC 栅极驱动器应用中的短脉冲宽度问题的建议](#)

说明

FAN73611 是一款单片高侧栅极驱动 IC，可以驱动工作电压最高达 +600 V 的 MOSFET 和 IGBT。Fairchild 的高压工艺和共模噪声消除技术可使高侧驱动器在高 dv/dt 噪声环境下稳定运行。先进的电平转换电路，能使高端栅极驱动器的工作电压在 $V_{BS} = 15\text{ V}$ 时高达 $V_S = -9.8\text{ V}$ （典型值）。当 V_{DD} 或 V_{BS} 小于指定阈值电压时，UVLO 电路可防止发生故障。输出驱动器的典型源电流 / 灌电流分别为 250 mA/500 mA，适于等离子显示板 (PDP) 应用、电机驱动逆变器和开关电源应用。

8-SOP



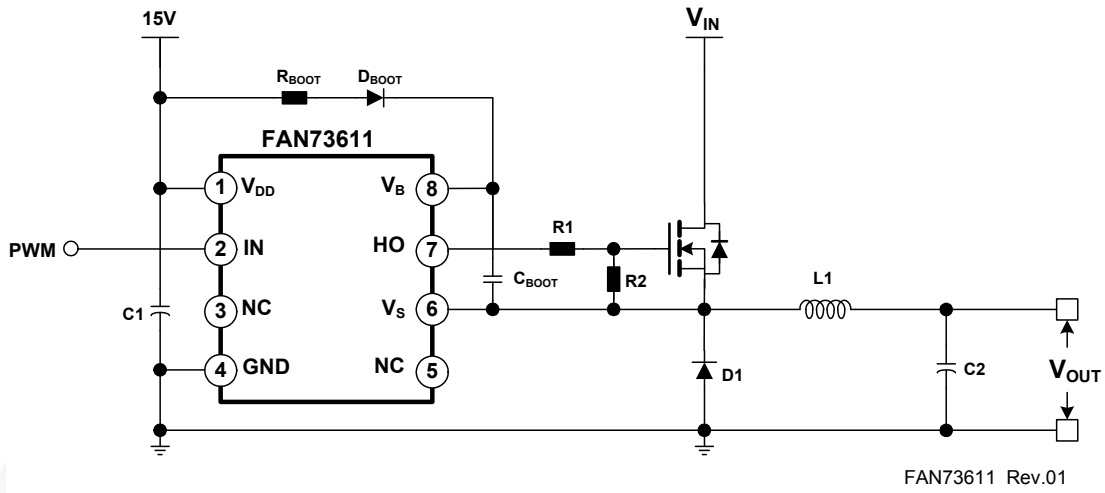
订购信息

部件编号	封装	工作温度	包装方法	说明
FAN73611MX ⁽¹⁾	8 SOP	-40°C ~ 125°C	卷带和卷盘	照明应用

说明:

1. 该器件已通过 JESD22A-111 波峰焊测试。

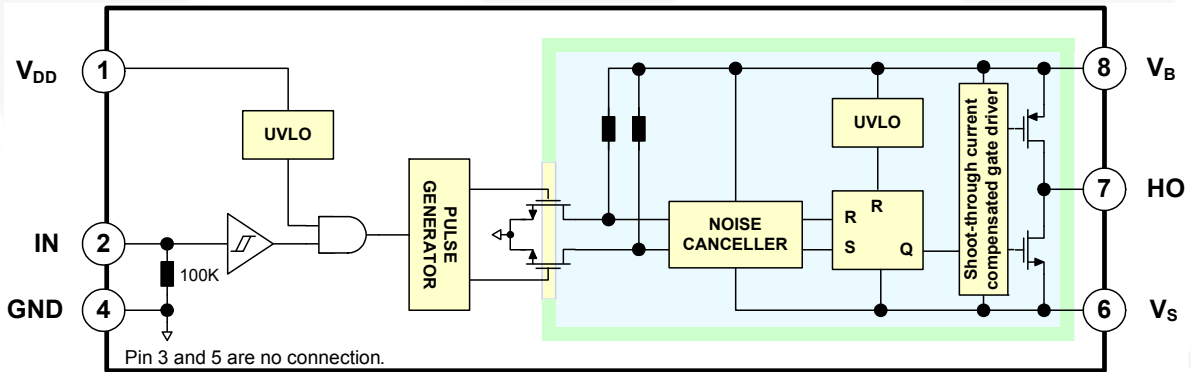
典型应用电路图



FAN73611 Rev.01

图 1. 降压直流—直流转换器应用

内部框图



FAN73611 Rev.02

图 2. 功能框图

引脚配置

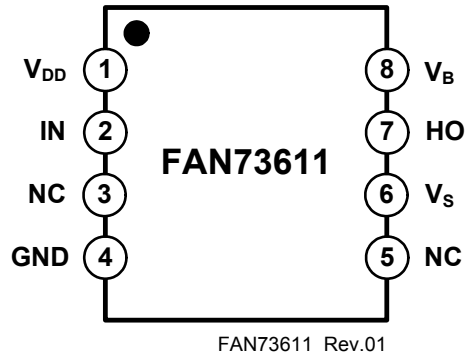


图 3. 引脚配置（俯视图）

引脚定义

引脚号	名称	说明
1	V _{DD}	电源电压
2	IN	高侧栅极驱动器输出的逻辑输入
3	NC	无连接
4	GND	接地
5	NC	无连接
6	V _S	高侧浮动电源电压返回
7	HO	高侧驱动输出
8	V _B	高侧浮动电源

绝对最大额定值

应力超过绝对最大额定值，可能会损坏器件。在超出推荐的工作条件的情况下，该器件可能无法正常工作，所以不建议让器件在这些条件下长期工作。此外，长期在高于推荐的工作条件下工作，会影响器件的可靠性。绝对最大额定值仅是应力规格值。T_A = 25°C，除非另有说明。

符号	特性	最小值	最大值	单位
V _S	高侧浮动偏置电压	V _B -25	V _B +0.3	V
V _B	高侧浮动电源电压	-0.3	625.0	V
V _{HO}	高侧浮动输出电压	V _S -0.3	V _B +0.3	V
V _{DD}	低端和逻辑电源电压	-0.3	25.0	V
V _{IN}	逻辑输入电压	-0.3	V _{DD} +0.3	V
dV _S /dt	允许的偏置电压变化速率		± 50	V/ns
P _D	功耗 ^(2, 3, 4)		0.625	W
θ _{JA}	热阻		200	°C/W
T _J	结温	-55	+150	°C
T _{STG}	存储温度	-55	+150	°C

注意：

- 安装到 76.2 x 114.3 x 1.6 mm PCB 板（FR-4 环氧玻璃材料）。
- 参照下列标准：
JESD51-2: 集成电路热测试方法环境条件 — 自然对流和
JESD51-3: 含铅表面贴装封装的低有效导热系数测试板。
- 任何情况下，都不得超过功耗 (P_D)。

推荐工作条件

推荐的操作条件表明了器件的真实工作条件。指定推荐的工作条件，以确保器件的最佳性能达到数据表中的规格。Fairchild 不建议超出推荐的工作条件，或按照绝对最大额定值进行设计。

符号	参数	最小值	最大值	单位
V _B	高侧浮动电源电压	V _S +10	V _S +20	V
V _S	高侧浮动电源偏置电压	6-V _{DD}	600	V
V _{HO}	高侧输出电压	V _S	V _B	V
V _{IN}	逻辑输入电压	GND	V _{DD}	V
V _{DD}	电源电压	10	20	V
T _A	操作环境温度	-40	+125	°C

电气特性

V_{BIAS} (V_{DD} , V_{BS}) = 15.0 V 且 $T_A = 25^\circ\text{C}$ 。 V_{IN} 和 I_{IN} 参数以 GND 作为基准。 V_O 和 I_O 参数以 V_S 为参考点, 适用于对应的输出 HO, 除非另有规定。

符号	特性	测试条件	最小值	典型值	最大值	单位
电源部分						
I_{QDD}	V_{DD} 静态电源电流	$V_{IN}=0\text{ V or }5\text{ V}$, $C_{LOAD}=1000\text{ pF}$		80	140	μA
I_{PDD}	V_{DD} 工作电源电流	$C_{LOAD}=1000\text{ pF}$, $f_{IN}=20\text{ KHz}$, RMS 值		80	160	μA
V_{DDUV+} V_{BSUV+}	V_{DD} 和 V_{BS} 电源欠压正向阈值电压	$V_{DD}=\text{扫描}$, $V_{BS}=\text{扫描}$	7.8	8.8	9.8	V
V_{DDUV-} V_{BSUV-}	V_{DD} 和 V_{BS} 电源欠压负向阈值电压	$V_{DD}=\text{扫描}$, $V_{BS}=\text{扫描}$	7.3	8.3	9.3	V
V_{DDHYS} V_{BSHYS}	V_{DD} 和 V_{BS} 电源欠压锁定滞回电压	$V_{DD}=\text{扫描}$, $V_{BS}=\text{扫描}$		0.5		V
I_{LK}	偏置电源漏电流	$V_B=V_S=600\text{ V}$			10	μA
I_{QBS}	V_{BS} 静态电源电流	$V_{IN}=0\text{ V or }5\text{ V}$, $C_{LOAD}=1000\text{ pF}$		60	100	μA
I_{PBS}	V_{BS} 工作电源电流	$C_{LOAD}=1000\text{ pF}$, $f_{IN}=20\text{ KHz}$, RMS 值		420	600	μA
输入逻辑部分						
V_{IH}	逻辑“1”输入电压		2.5			V
V_{IL}	逻辑“0”输入电压				0.8	V
I_{IN+}	逻辑输入高电平偏置电流	$V_{IN}=5\text{ V}$		50	75	μA
I_{IN-}	逻辑输入低电平偏置电流	$V_{IN}=0\text{ V}$			2	μA
R_{IN}	输入下拉电阻		60	100		$\text{K}\Omega$
栅极驱动器输出部分						
V_{OH}	高电平输出电压 ($V_{BIAS} - V_O$)	无负载			0.1	V
V_{OL}	低电平输出电压	无负载			0.1	V
I_{O+}	输出高, 短路脉冲电流	$V_{HO}=0\text{ V}$, $V_{IN}=5\text{ V}$, $PW \leq 10\text{ }\mu\text{s}$	200	250		mA
I_{O-}	输出低, 短路脉冲电流	$V_{HO}=15\text{ V}$, $V_{IN}=0\text{ V}$, $PW \leq 10\text{ }\mu\text{s}$	400	500		mA
V_S	IN 信号传播到 HO 时允许的 V_S 引脚负电压	$V_{BS}=15\text{ V}$		-9.8	-7.0	V

动态电气特性

除非另有规定, $V_{DD}=V_{BS}=15\text{ V}$, $C_{LOAD}=1000\text{ pF}$, 以及 $T_A=25^\circ\text{C}$ 。

符号	参数	工作条件	最小值	典型值	最大值	单位
t_{on}	导通传播延迟时间	$V_S=0\text{ V}$	70	120	170	ns
t_{off}	关断传播延迟时间	$V_S=0\text{ V}$	70	120	170	ns
t_r	开通上升时间			70	140	ns
t_f	关断下降时间			30	60	ns

典型特性

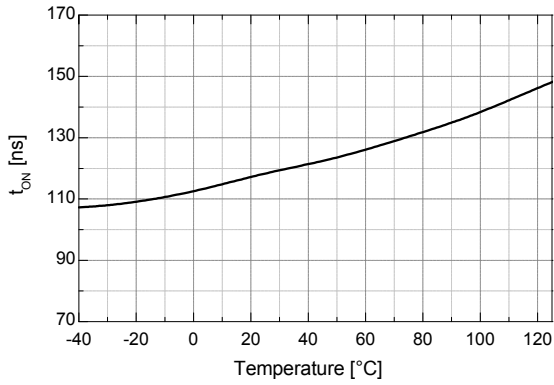


图 5. 开通传输延时与温度的关系

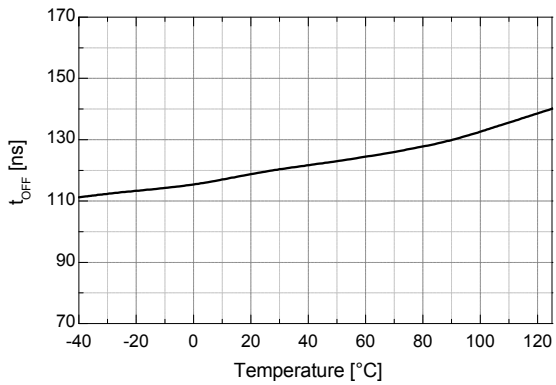


图 6. 关断传输延时与温度的关系

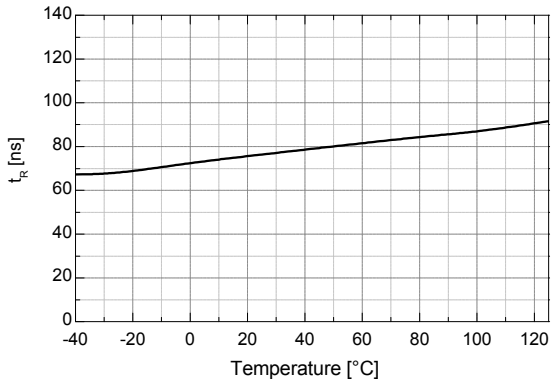


图 7. 开通上升时间与温度的关系

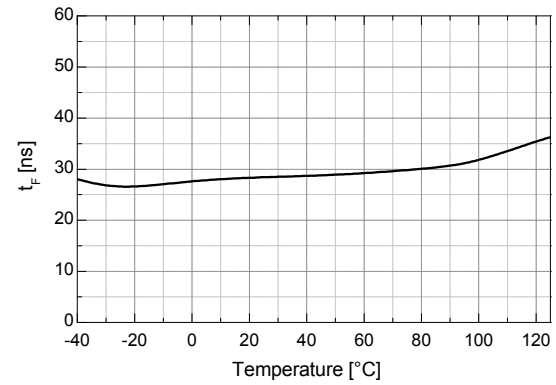


图 8. 导通下降时间与温度的关系

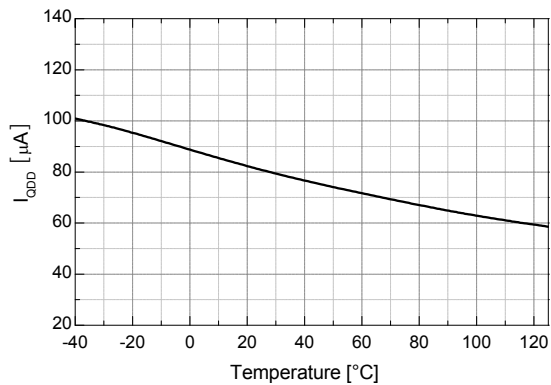


图 9. 静态 V_{DD} 电源电流与温度的关系

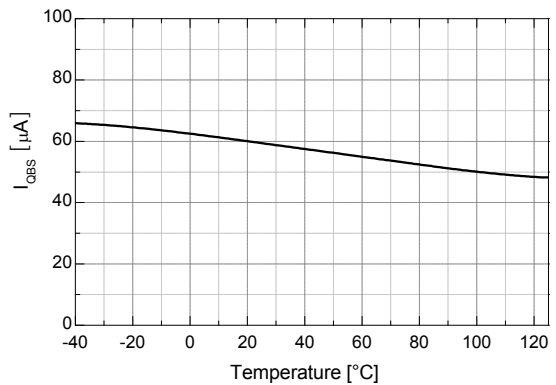


图 10. 静态 V_{BS} 电源电流与温度的关系

典型特性 (续)

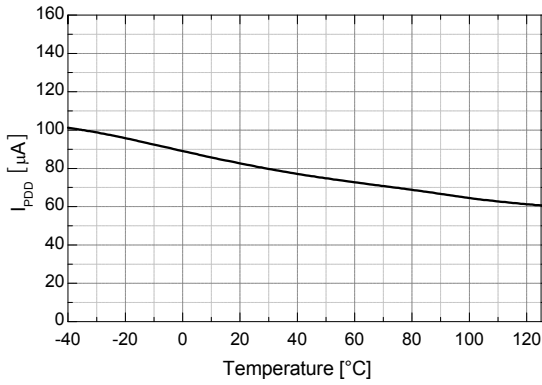


图 11. 工作时 V_{DD} 电源电流与温度的关系

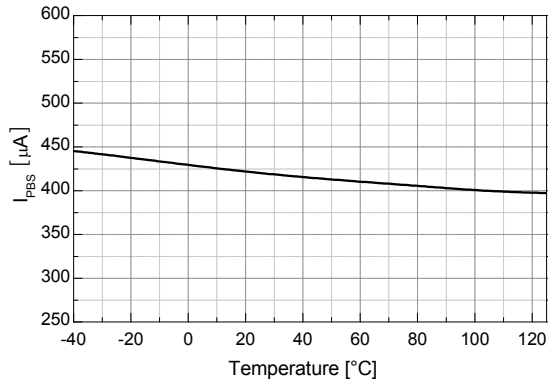


图 12. V_{BS} 工作电源电流与温度的关系

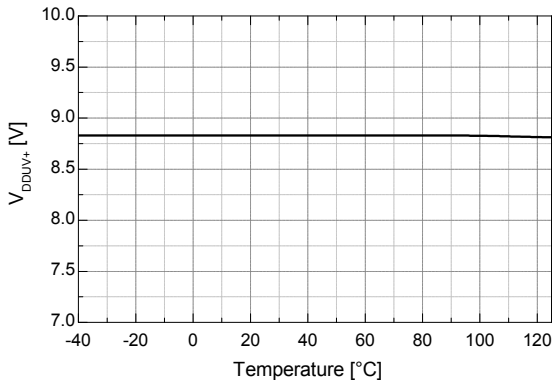


图 13. V_{DD} UVLO+ 与温度的关系

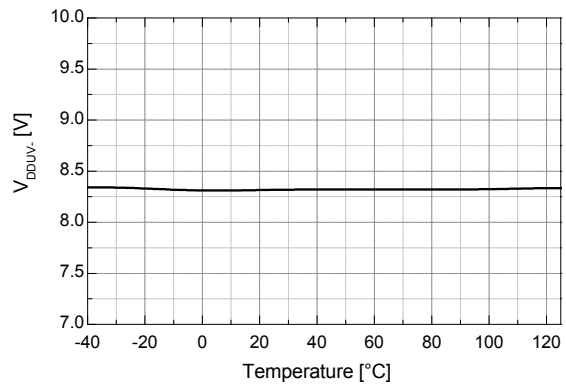


图 14. V_{DD} UVLO- 与温度的关系

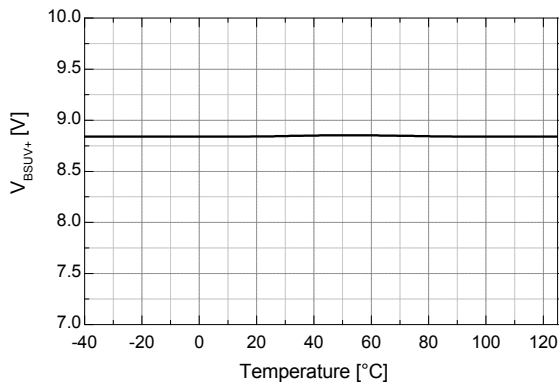


图 15. V_{BS} UVLO+ 与温度的关系

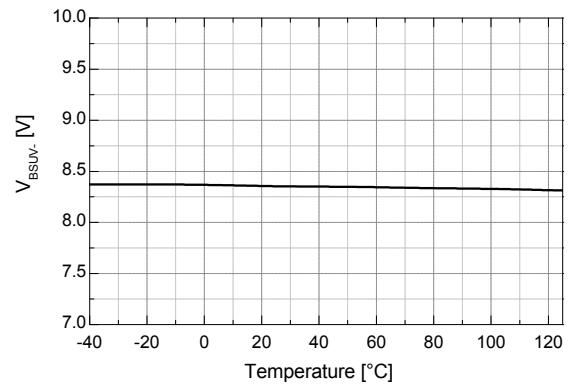


图 16. V_{BS} UVLO- 与温度的关系

典型特性 (续)

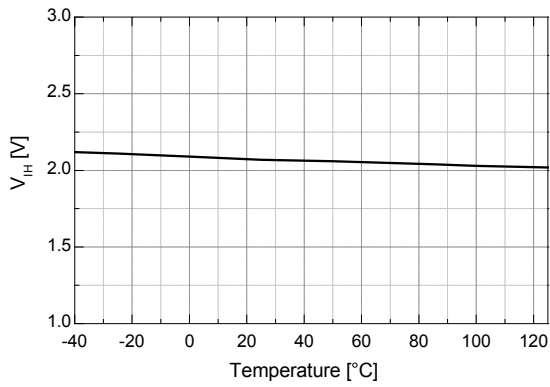


图 17. 逻辑高输入电压与温度的关系

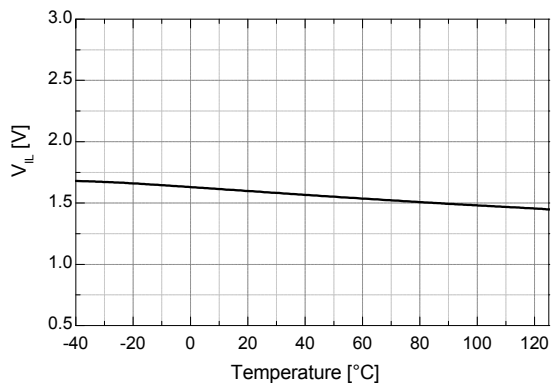


图 18. 逻辑低输入电压与温度的关系

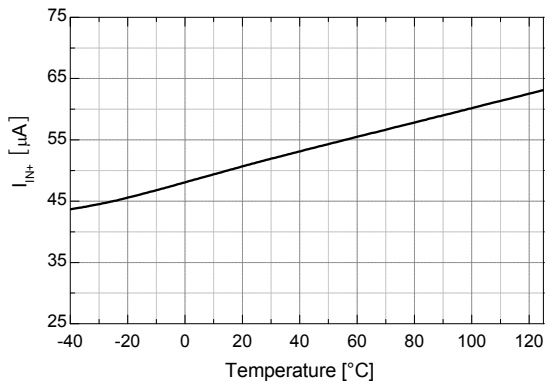


图 19. 逻辑高输入偏压电流与温度的关系

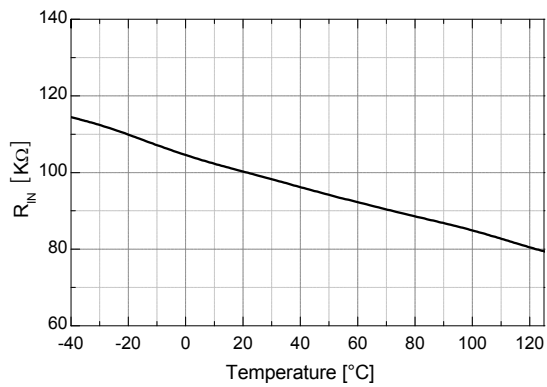


图 20. 输入下拉电阻与温度的关系

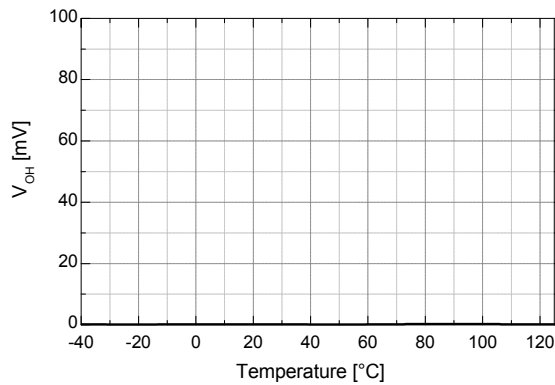


图 21. 高电平输出电压与温度的关系

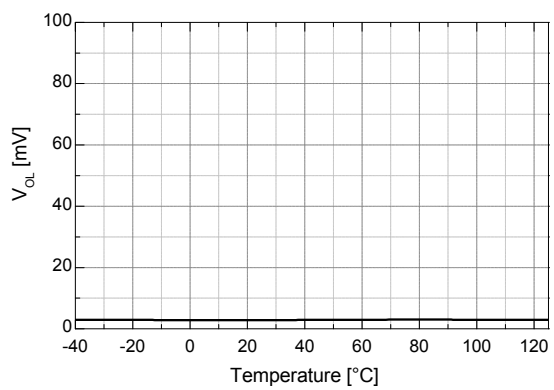


图 22. 低电平输出电压与温度的关系

典型特性 (续)

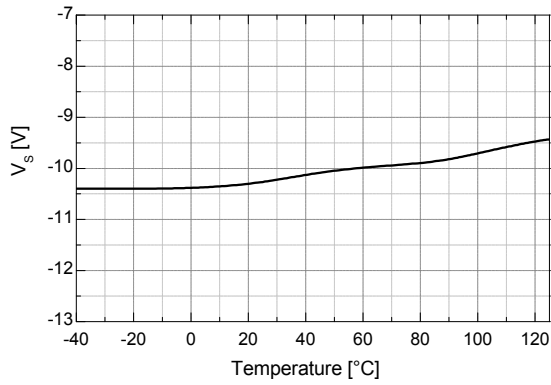


图 23. 容许的负 V_S 电压与温度的关系

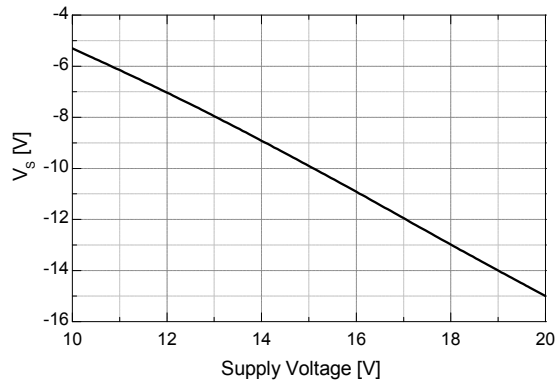


图 24. 允许负 V_S 电压与 电源电压

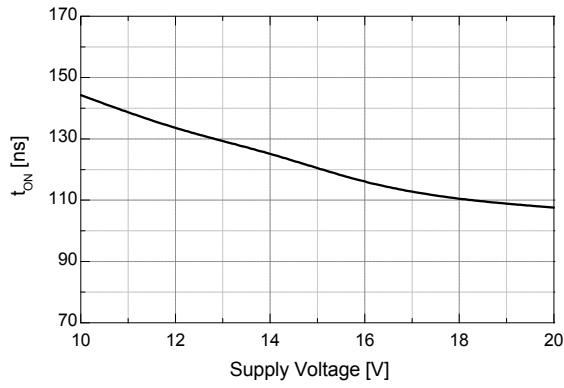


图 25. 导通传播延时与电源电压的关系

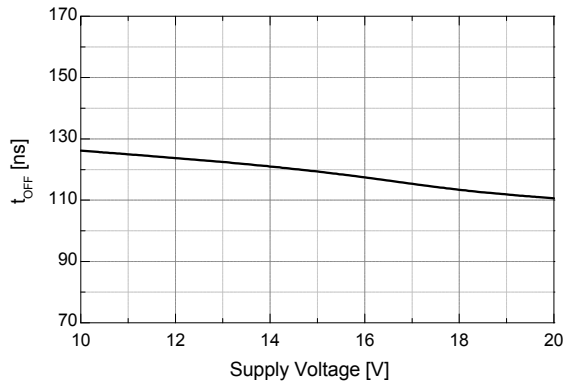


图 26. 关断传播延时与电源电压的关系

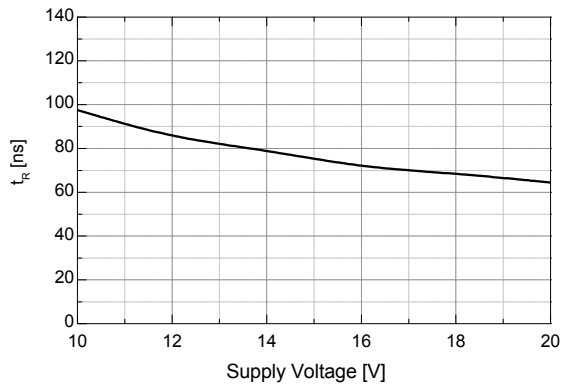


图 27. 开通上升时间与电源电压的关系

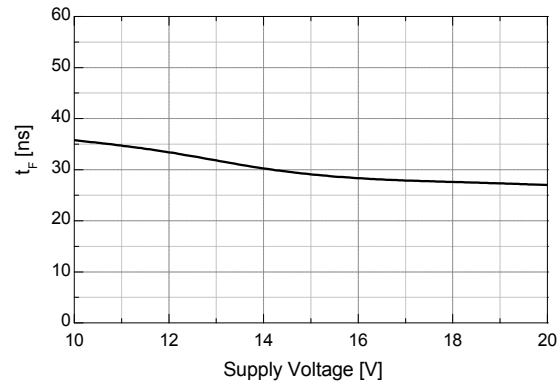


图 28. 关断下降时间与 电源电压

典型特性 (续)

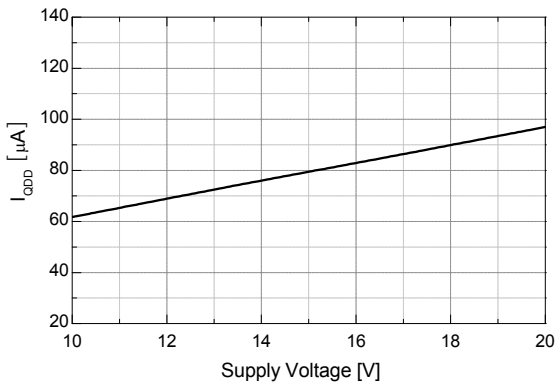


图 29. V_{DD} 静态电源电流与电源电压的关系

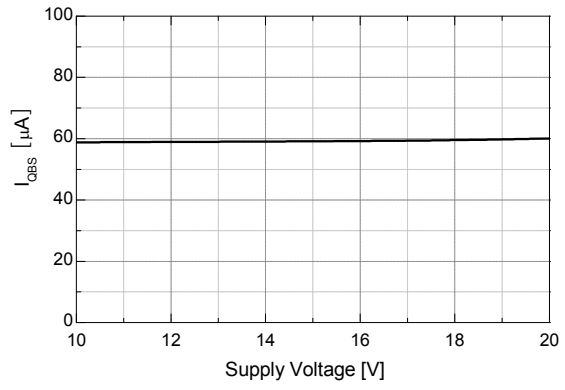


图 30. V_{BS} 静态电源电流与电源电压的关系

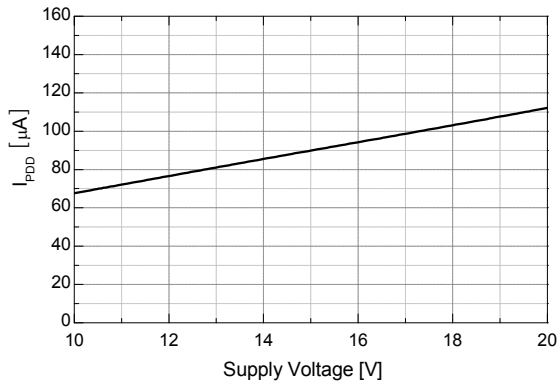


图 31. 工作时 V_{DD} 电源电流与电源电压的关系

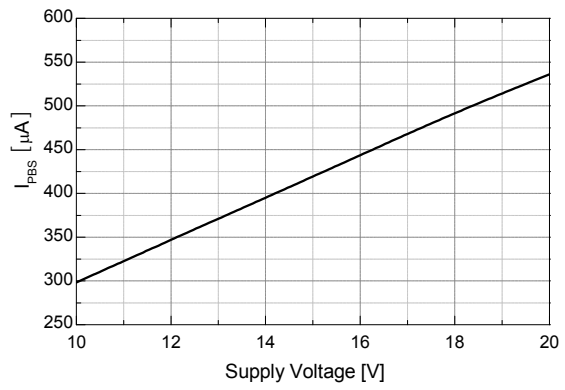


图 32. 工作时 V_{BS} 电源电流与电源电压的关系

开关时间定义

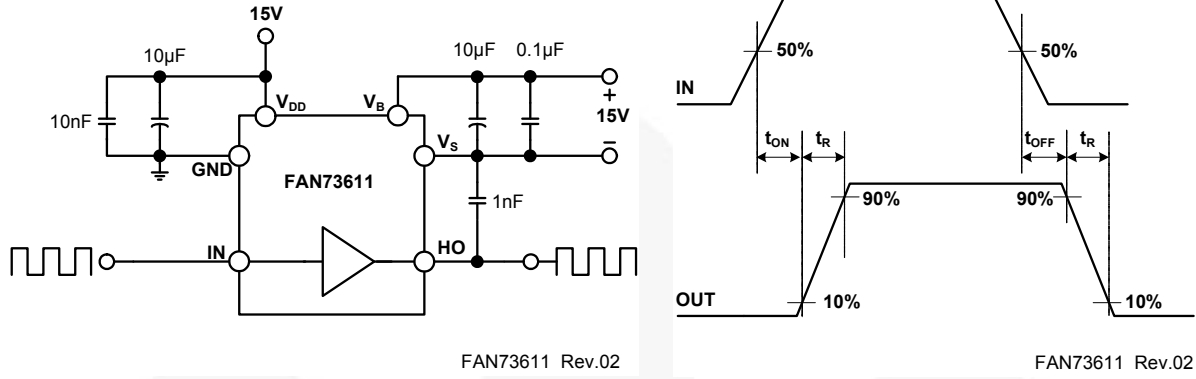


图 33. 开关时间测试电路和波形定义

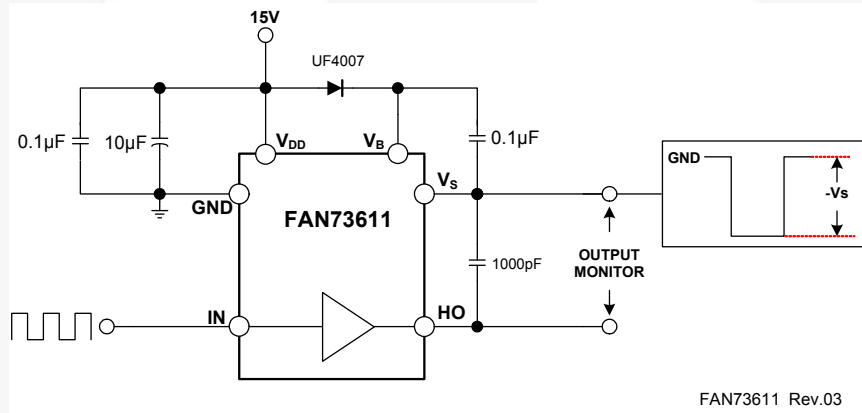
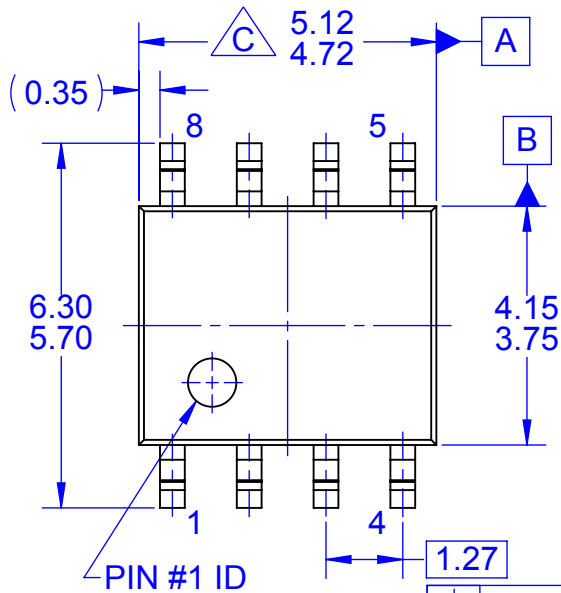
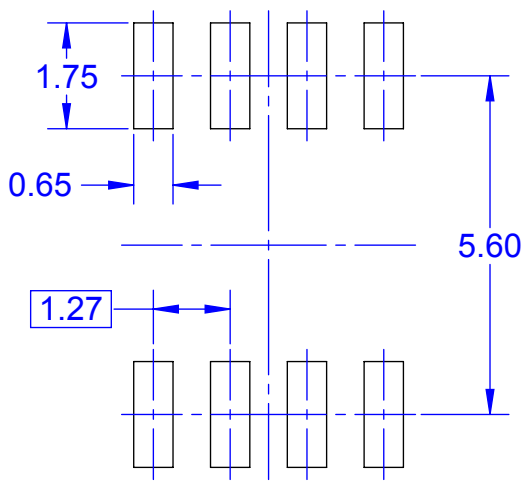


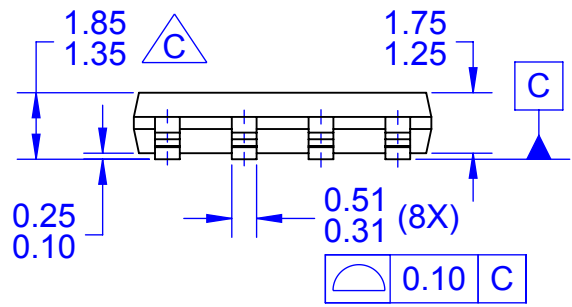
图 34. 浮动电源电压瞬态测试



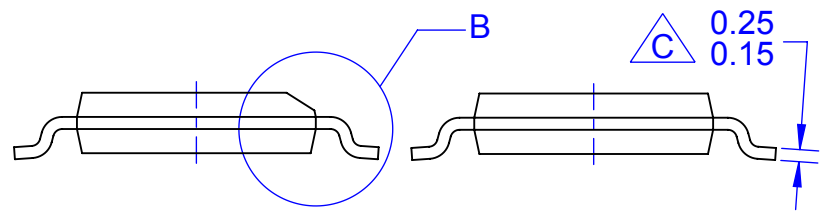
TOP VIEW



LAND PATTERN RECOMMENDATION



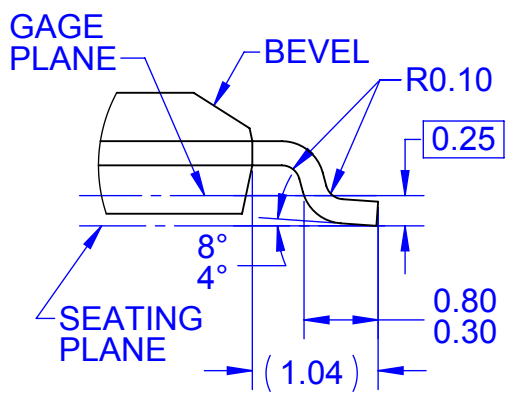
FRONT VIEW



OPTION A
BEVEL EDGE

OPTION B
NON-BEVEL EDGE

SIDE VIEW



DETAIL "B"
SCALE 2:1

NOTES: UNLESS OTHERWISE SPECIFIED

- A. THIS PACKAGE CONFORMS TO JEDEC MS-012 VARIATION A EXCEPT WHERE NOTED.
- B. ALL DIMENSIONS ARE IN MILLIMETERS
- $\triangle C$ OUT OF JEDEC STANDARD VALUE
- D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
- E. LAND PATTERN AS PER IPC SOIC127P600X175-8M
- F. DRAWING FILENAME: MKT-M08Brev2



ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>
For additional information, please contact your local
Sales Representative