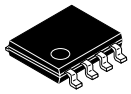
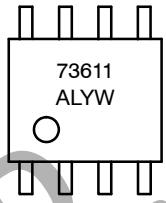
单通道高侧栅极驱动 IC
FAN73611



SOIC8
(8–SOP)
CASE 751EG

MARKING DIAGRAM



73611 = Device Code
A = Assembly Site
L = Wafer Lot Number
YW = Assembly Start Week

ORDERING INFORMATION

See detailed ordering and shipping information on page 11 of this data sheet.

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。**onsemi** 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 V 时高达 V_S = –9.8 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。

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)
- This is a Pb–Free Device

应用

- 电子镇流器
- 开关电源 SMPS

相关资源

- 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

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典型应用电路

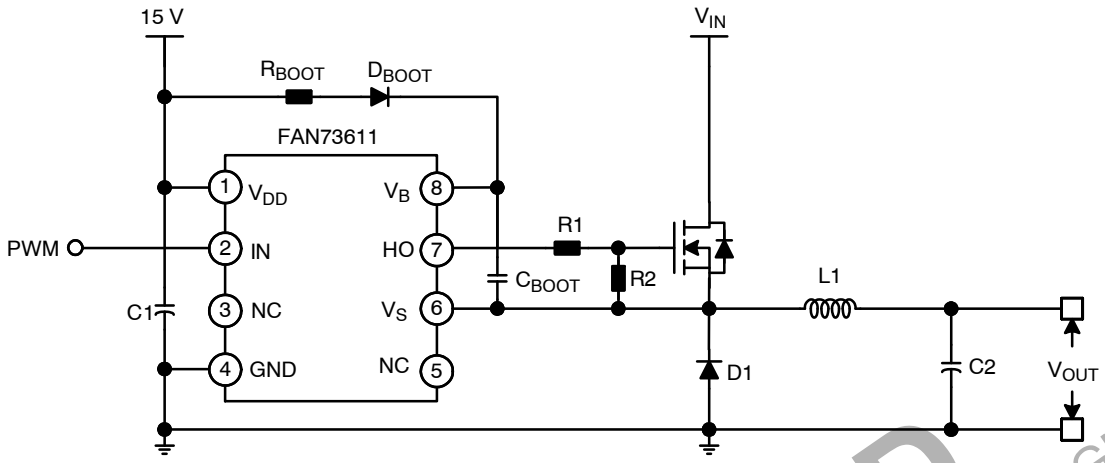

图 1. 降压直流—直流转换器应用

内部框图

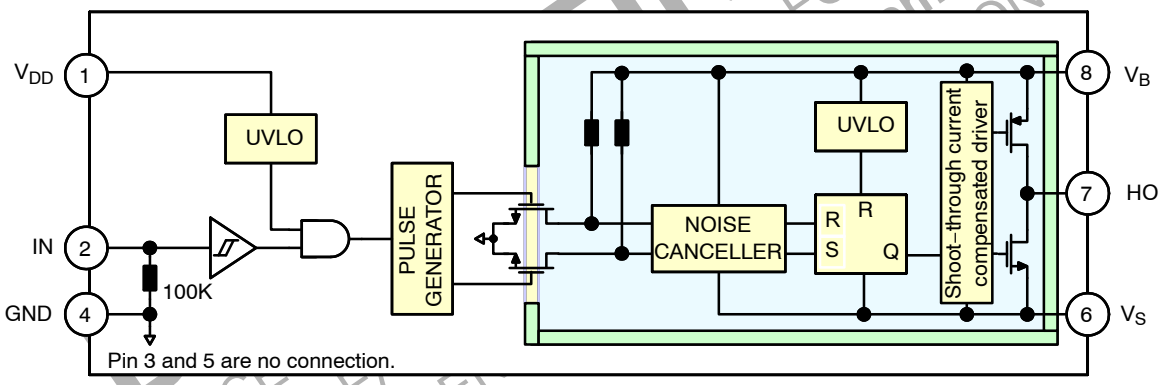

图 2. 功能框图

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引脚配置

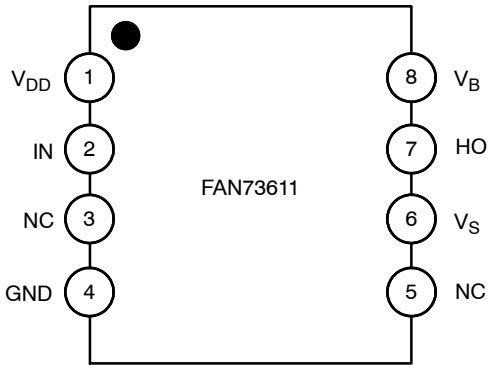

图 3. 引脚配置 (俯视图)

引脚定义

引脚号	名称	描述
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

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绝对最大额定值 (除非另有说明，T_A = 25°C。)

符号	参数	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_{CC} + 0.3	V
dV_S/dt	允许的偏置电压变化速率	–	±50	V/ns
P_D	功耗 (注意 1, 2, 3)	–	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

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

(参考译文)

如果电压超过最大额定值表中列出的值范围，器件可能会损坏。如果超过任何这些限值，将无法保证器件功能，可能会导致器件损坏，影响可靠性。

1. 安装到 76.2 x 114.3 x 1.6 mm PCB 板上 (FR−4 环氧玻璃材料)。
2. 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。
3. 任何情况下，都不得超过功耗 P_D。

推荐工作额定值

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

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

(参考译文)

高于推荐工作范围表格中所列电压时，不保证能够正常运行。长时间在推荐工作范围表格中规定范围以外的电压下运行，可能会影响器件的可靠性。

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电气特性 (V_{BIAS} (V_{DD}, V_{BS}) = 15.0 V 且 T_A = 25°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 V or 5 V, C_{LOAD} = 1000 pF	–	80	140	μA
I_{PDD}	V_{DD} 工作电源电流	C_{LOAD} = 1000 pF, f_{IN} = 20 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} = 扫描, V_{BS} = 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} = 扫描, V_{BS} = 扫描	7.3	8.3	9.3	V
V_{DDHYS} V_{BSHYS}	V_{DD} 和 V_{BS} 电源欠压锁定滞洄电压	V_{DD} = 扫描, V_{BS} = 扫描	–	0.5	–	μA
I_{LK}	偏置电源漏电流	V_B = V_S = 600 V	–	–	10	μA
I_{QBS}	V_{BS} 静态电源电流	V_{IN} = 0 V or 5 V, C_{LOAD} = 1000 pF		60	100	μA
I_{PBS}	V_{BS} 工作电源电流	C_{LOAD} = 1000 pF, f_{IN} = 20 KHz, RMS 值		420	600	μA
输入逻辑部分						
V_{IH}	逻辑 “1” 输入电压 2.5		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 V	–	50	75	μA
I_{IN-}	逻辑输入低电平偏置电流	V_{IN} = 0 V	–	–	2	μA
R_{IN}	输入下拉电阻		60	100	–	kΩ
栅极驱动器输出部分						
V_{OH}	高电平输出电压	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 V, V_{IN} = 5 V, PW ≤ 10 μs	200	250	–	mA
I_{O-}	输出低, 短路脉冲电流	V_{HO} = 15 V, V_{IN} = 0 V, PW ≤ 10 μs	400	500	–	mA
V_S	IN 信号传播到 HO 时允许的 VS 引脚负电压 VBS	V_{BS} = 15 V	–	–9.8	–7.0	V

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
(参考译文)
除非另有说明，“电气特性”表格中列出的是所列测试条件下的产品性能参数。如果在不同条件下运行，产品性能可能与“电气特性”表格中所列性能参数不一致。

动态电气特性 (除非另有规定，V_{DD} = V_{BS} = 15 V, C_{LOAD} = 1000 pF, 以及 T_A = 25°C)

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

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
(参考译文)
除非另有说明，“电气特性”表格中列出的是所列测试条件下的产品性能参数。如果在不同条件下运行，产品性能可能与“电气特性”表格中所列性能参数不一致。

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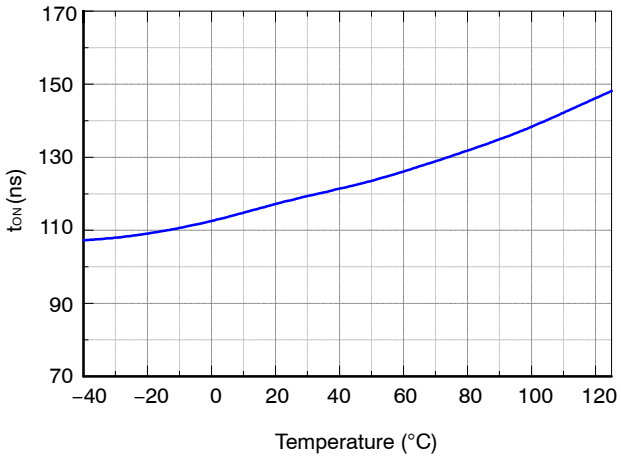

图 4. 开通传输延时与温度的关系

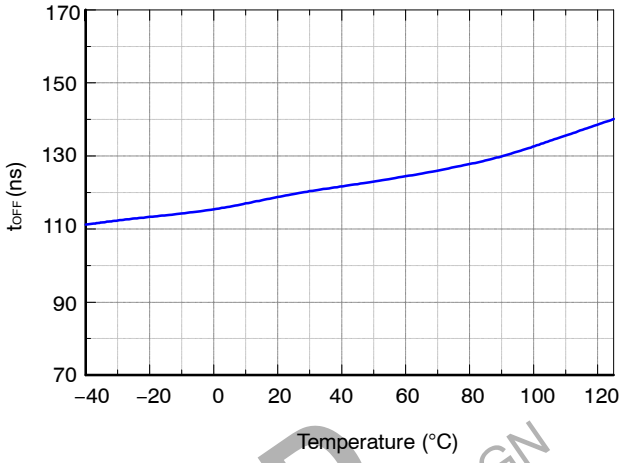

图 5. 关断传输延时与温度的关系

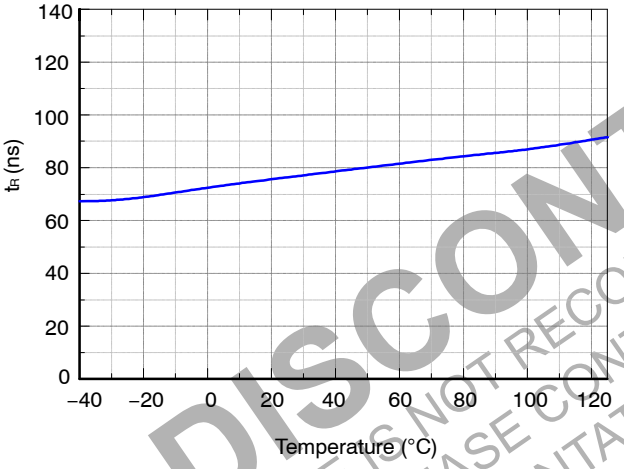

图 6. 开通上升时间与温度的关系

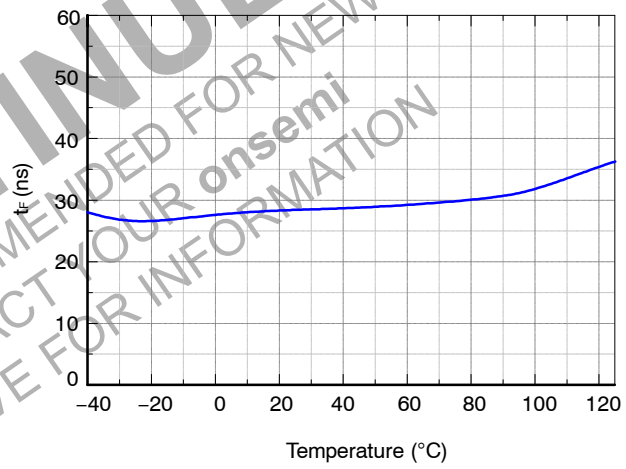

图 7. 导通下降时间与温度的关系

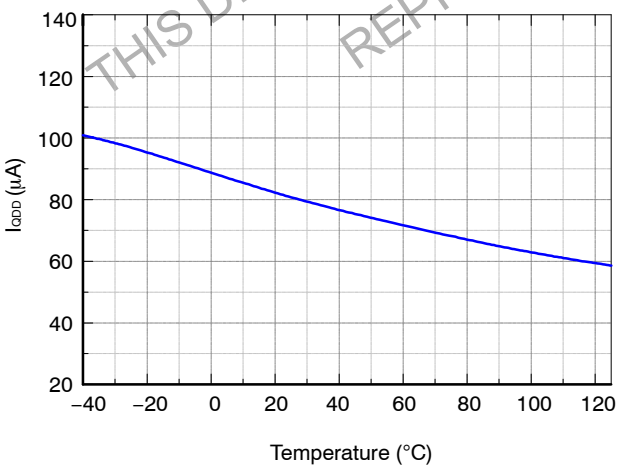

图 8. 静态 V_{DD} 电源电流与温度的关系

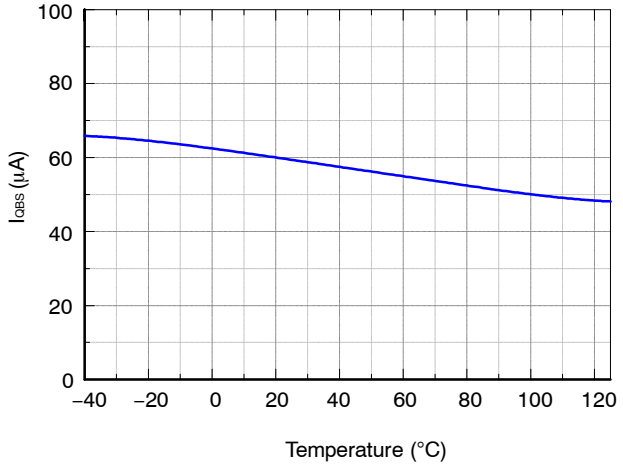

图 9. 静态 V_{BS} 电源电流与温度的关系

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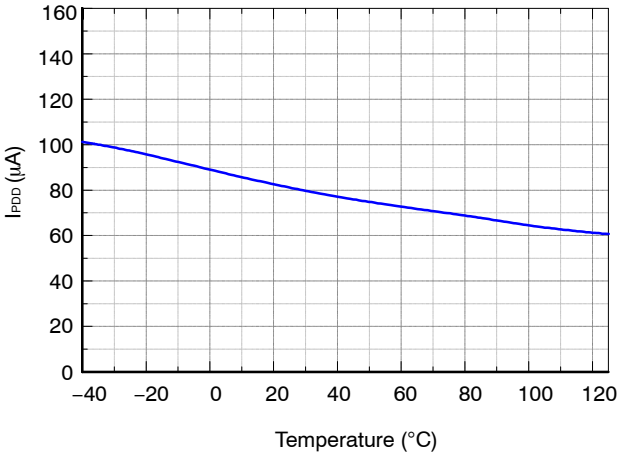

图 10. 工作时 V_{DD} 电源电流与温度的关系

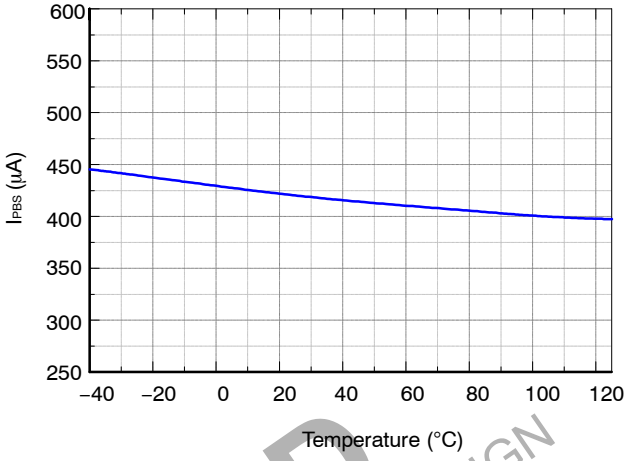

图 11. V_{BS} 工作电源电流与温度的关系

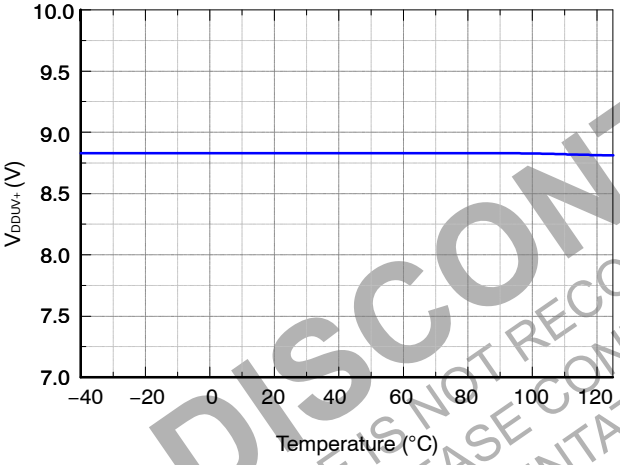

图 12. V_{DD} UVLO+ 与温度的关系

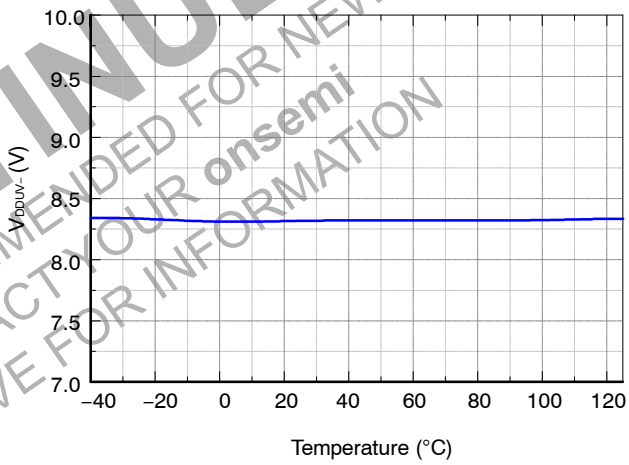

图 13. V_{DD} UVLO− 与温度的关系

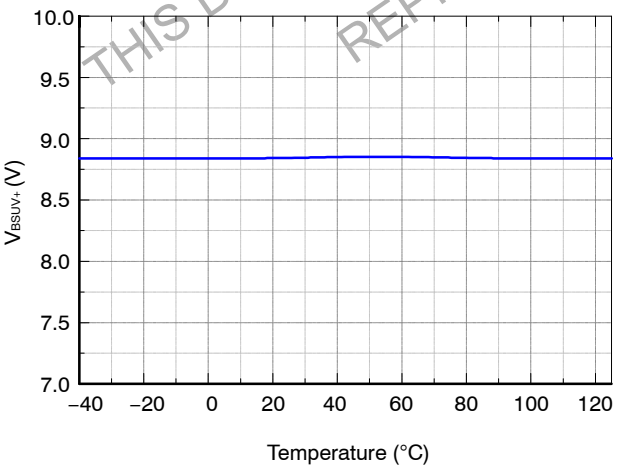

图 14. V_{BS} UVLO+ 与温度的关系

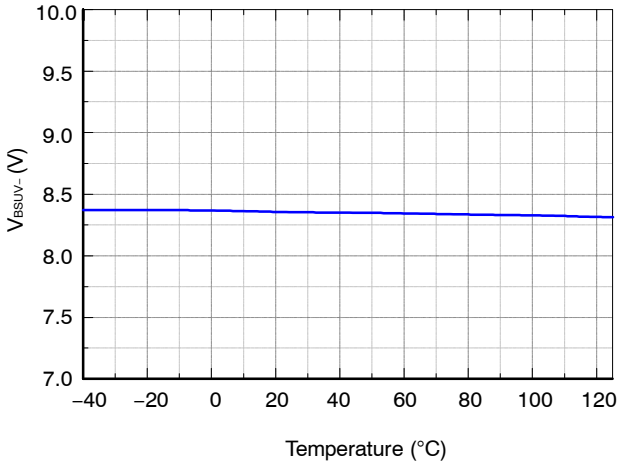

图 15. V_{BS} UVLO− 与温度的关系

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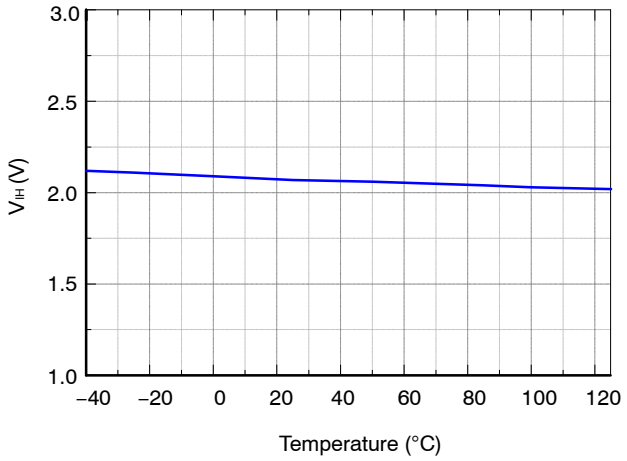

图 16. 逻辑高输入电压与 温度的关系

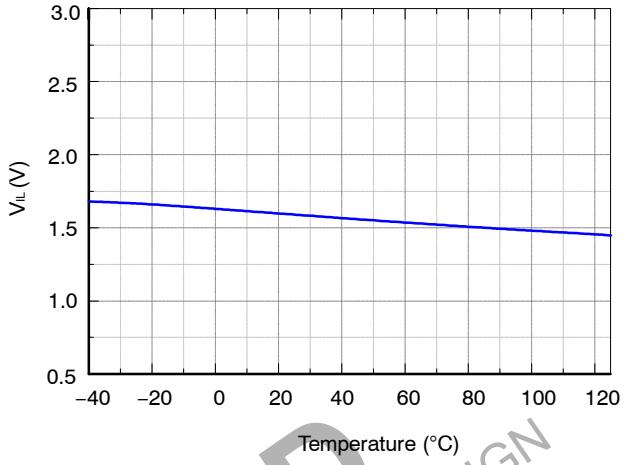

图 17. 逻辑低输入电压与温度的关系

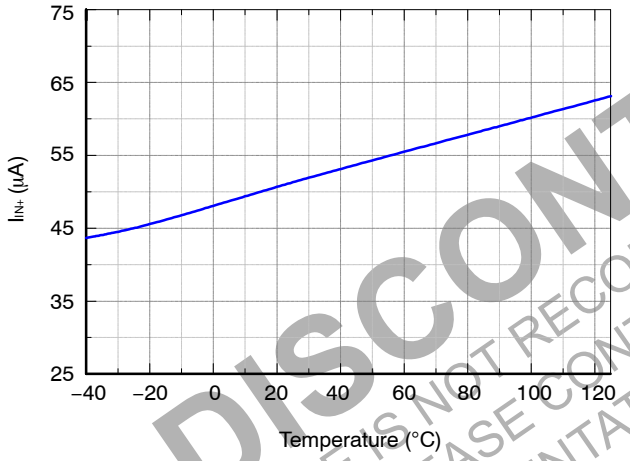

图 18. 逻辑高输入偏压电流与 温度的关系

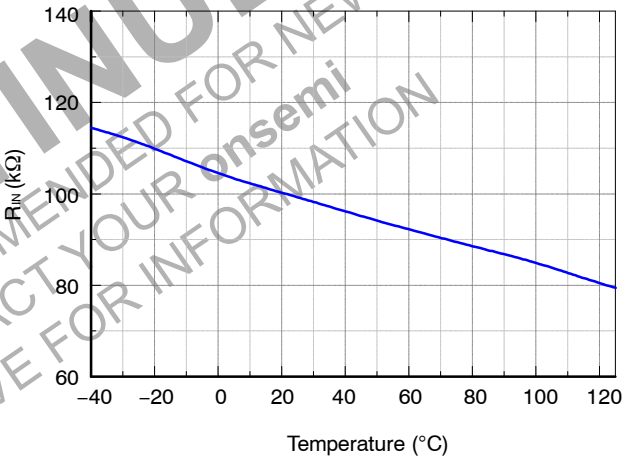

图 19. 输入下拉电阻与 温度的关系

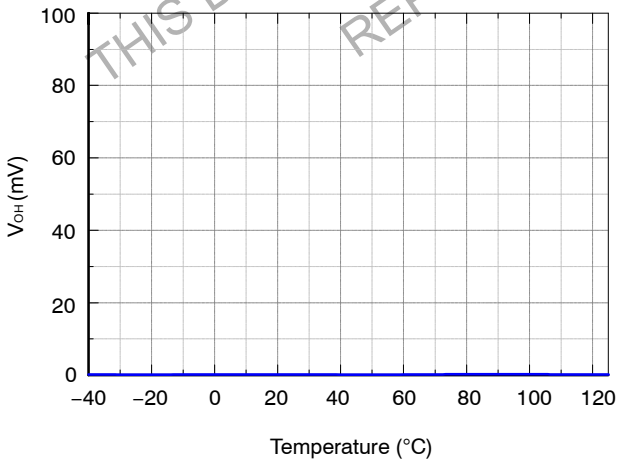

图 20. 高电平输出电压与温度的关系

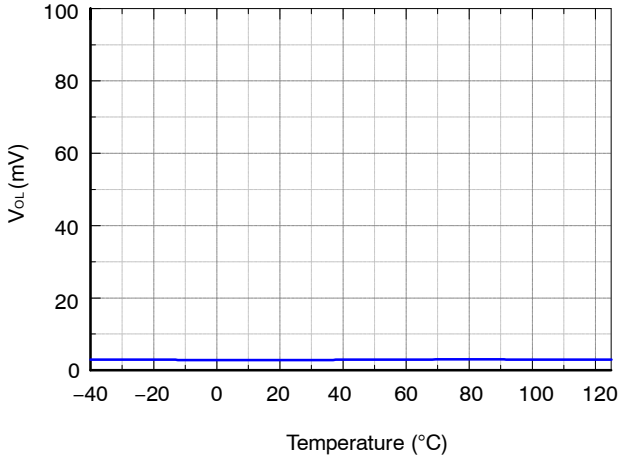

图 21. 低电平输出电压与温度的关系

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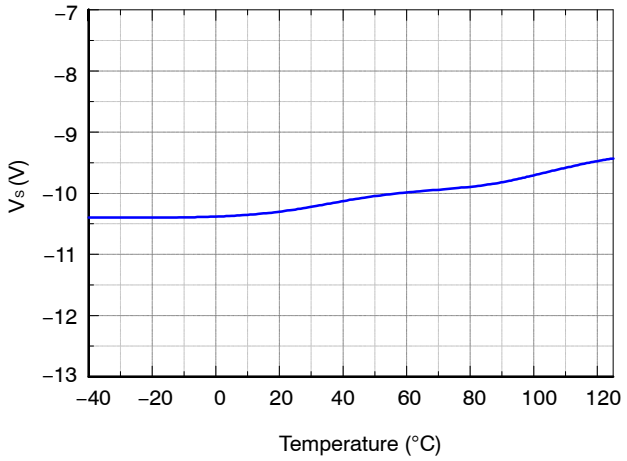

图 22. 容许的负 V_S 电压与温度的关系

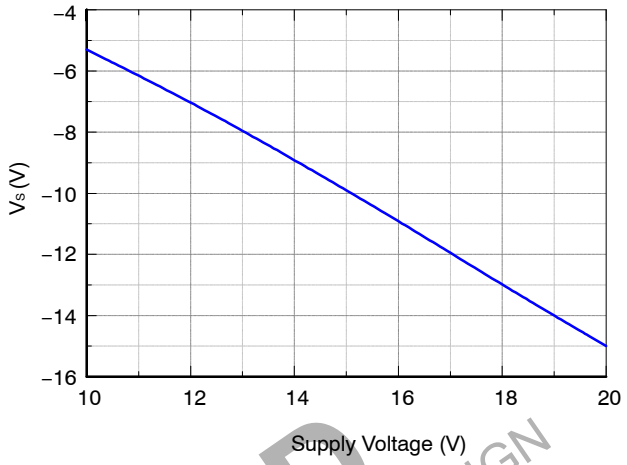

图 23. 允许负 V_S 电压与电源电压

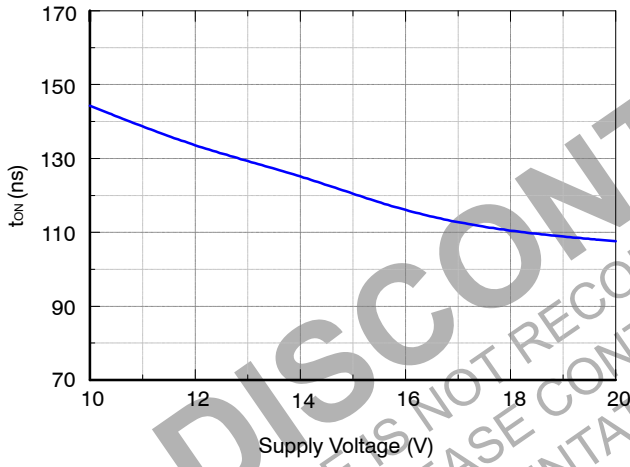

图 24. 导通传播延时与电源电压的关系

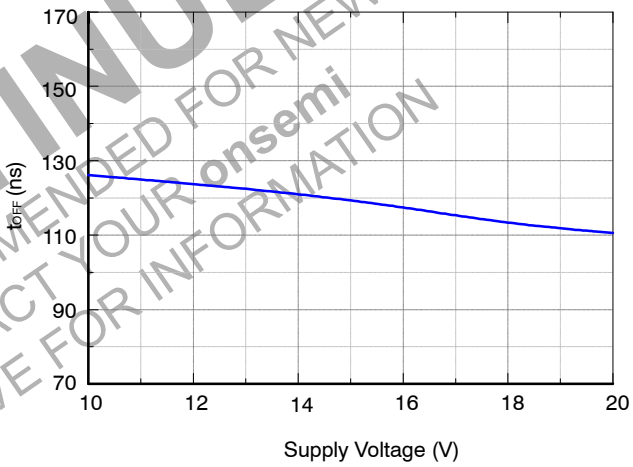

图 25. 关断传播延时与电源电压的关系

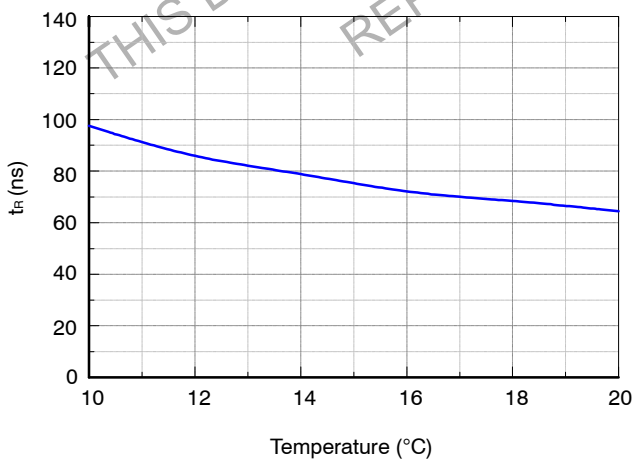

图 26. 开通上升时间与电源电压的关系

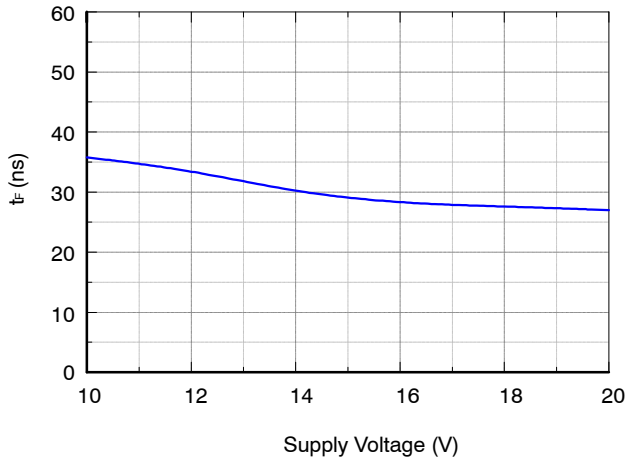

图 27. 关断下降时间与电源电压

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典型特性 (接上页)

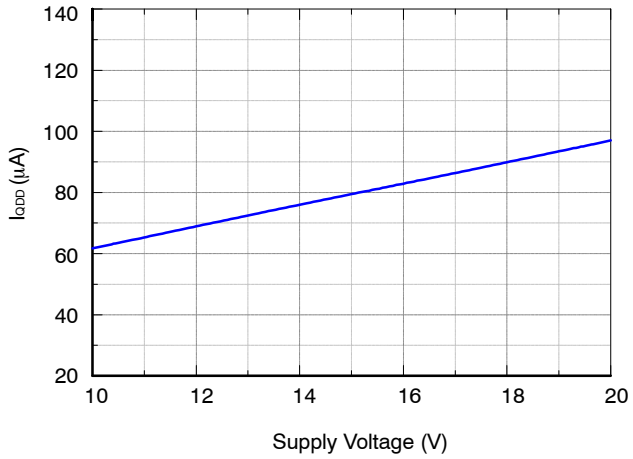

图 28. V_{DD} 静态电源电流与电源电压的关系

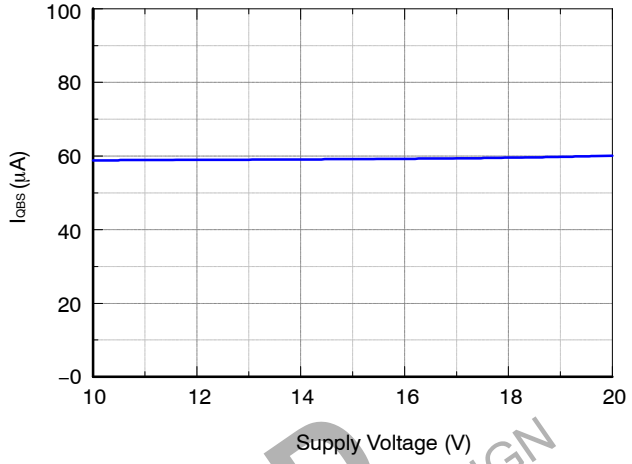

图 29. V_{BS} 静态电源电流与电源电压的关系

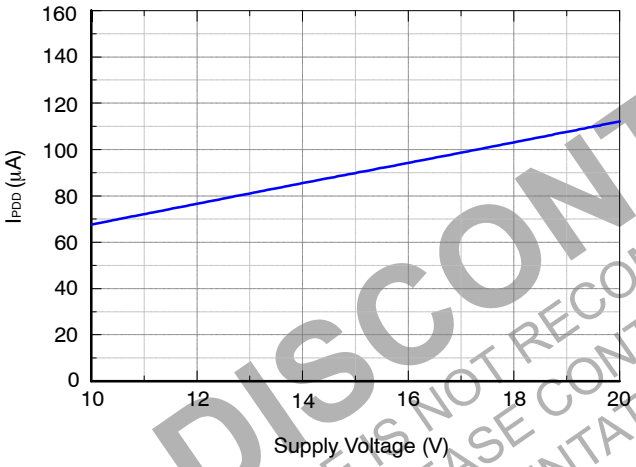

图 30. 工作时 V_{DD} 电源电流与电源电压的关系

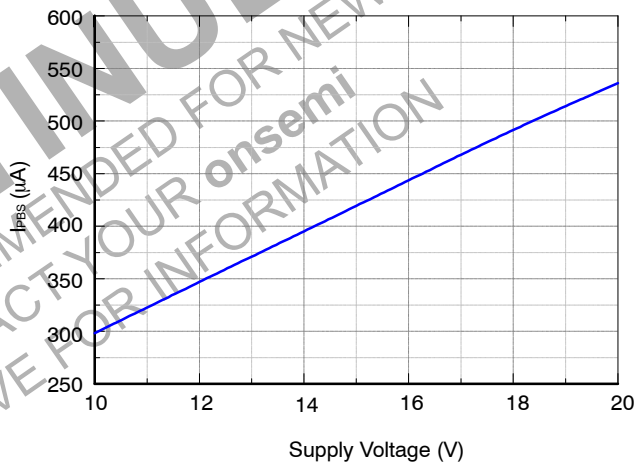

图 31. 工作时 V_{BS} 电源电流与电源电压的关系

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开关时间定义

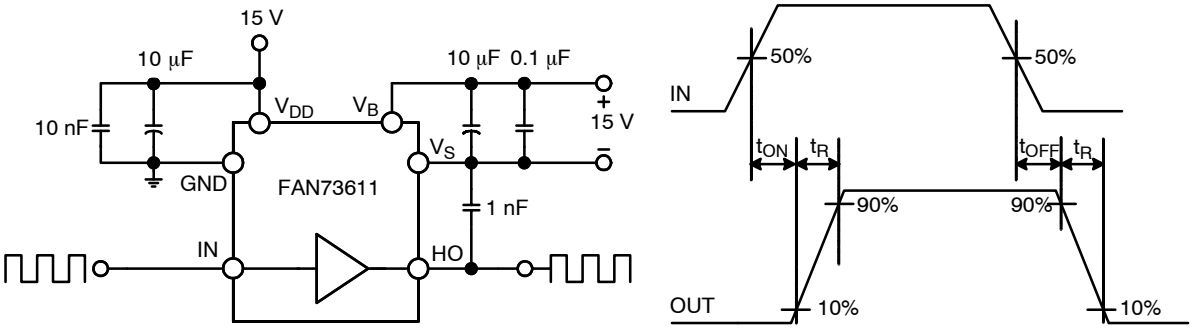

图 32. 开关时间测试电路和波形定义

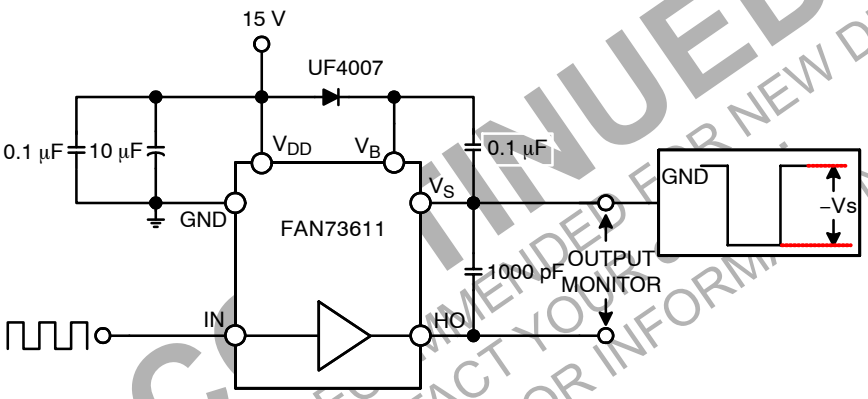

图 33. 浮动电源电压瞬态测试

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订购信息

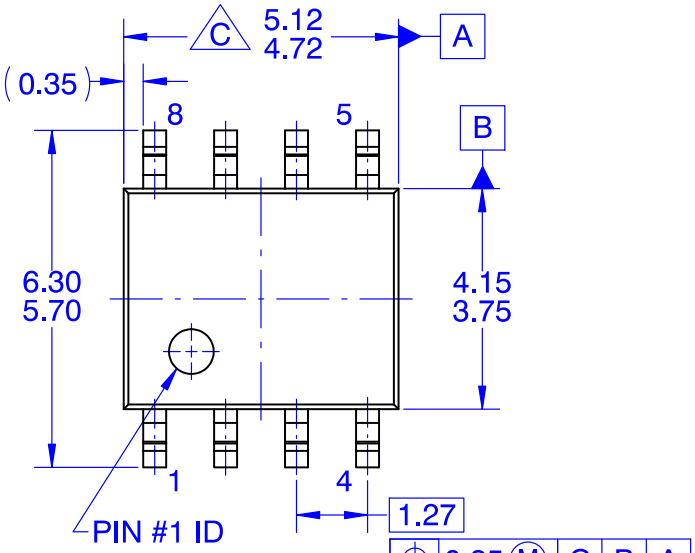
器件	封装	工作温度	描述	Shipping†
FAN73611MX (说明 4)	SOIC8 (8−SOP)	−40°C~+125°C	照明应用	3000 / 卷带和卷盘

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

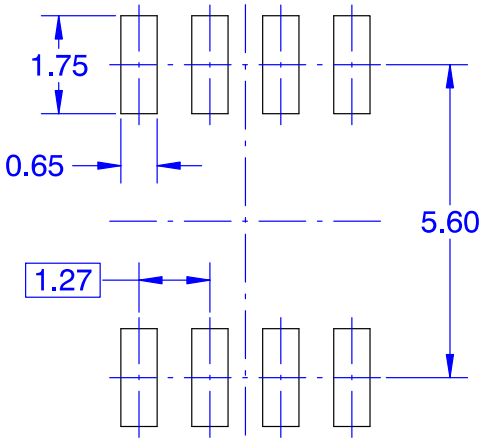
4. 该器件已通过 JESD22A−111 波动焊接测试。

SOIC8
CASE 751EG
ISSUE O

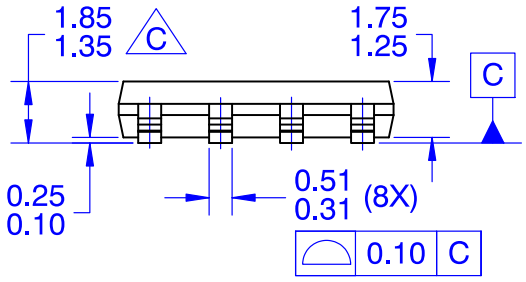
DATE 30 SEP 2016



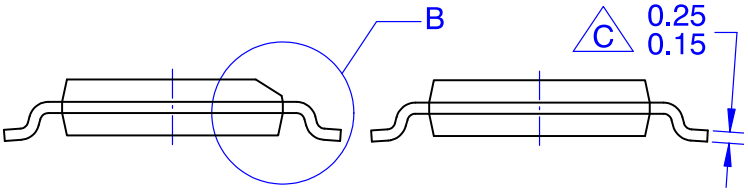
TOP VIEW



LAND PATTERN RECOMMENDATION



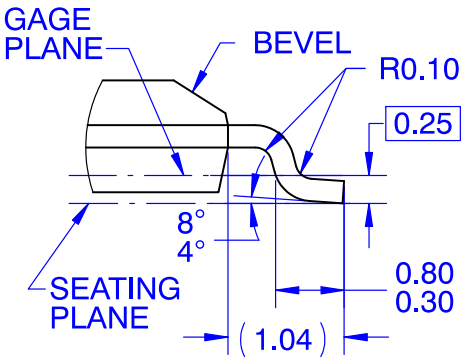
FRONT VIEW



OPTION A
BEVEL EDGE

OPTION B
NON–BEVEL EDGE

SIDE VIEW



DETAIL "B"
SCALE 2:1

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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

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