TELEFUNKEN
Semiconductors

ADVANCE INFO

TF2106

High-Side and Low-Side Gate Driver

Features:

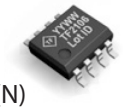
- **Floating high-side driver in bootstrap operation to 600V**
- **Drives two N-channel MOSFETs or IGBTs in a half bridge configuration**
- **Outputs tolerant to negative transients**
- **Wide logic and low side gate driver supply voltage: 10V to 20V**
- **Logic input (HIN and LIN) 3.3V capability**
- **Schmitt triggered logic inputs with internal pull down**
- **Undervoltage lockout for high and low side drivers**
- **Extended temperature range:-40°C to +125°C**

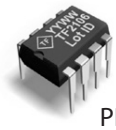
Description

The TF2106 is a high voltage, high speed gate driver capable of driving N-channel MOSFETs and IGBTs in a half bridge configuration. Telefunken's high voltage process enables the TF2106's high side to switch to 600V in a bootstrap operation.

The TF2106 logic inputs are compatible with standard TTL and CMOS levels (down to 3.3V) to interface easily with controlling devices. The driver outputs feature high pulse current buffers designed for minimum driver cross conduction.

The TF2106 is offered in 8-pin PDIP and 8-pin SOIC narrow package and operates over an extended -40 °C to +125 °C temperature range.


SOIC-8(N)


PDIP-8

Applications

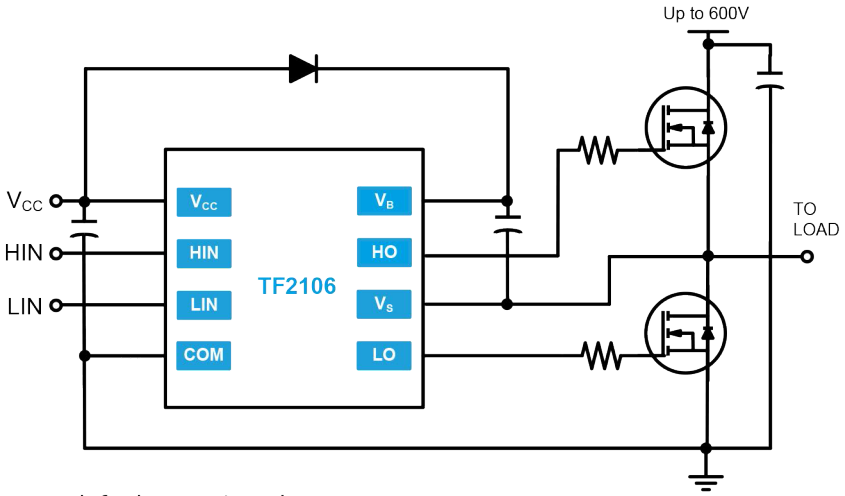
- DC-DC Converters
- AC-DC Inverters
- Motor Controls
- Class D Power Amplifiers

Ordering Information

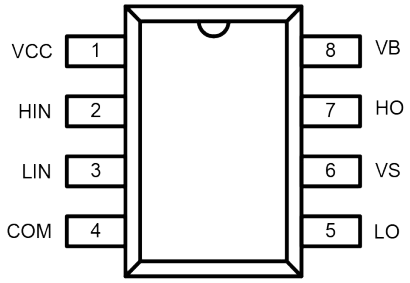
Year Year Week Week

PART NUMBER	PACKAGE	PACKING / Qty	MARK
TF2106-3AS	PDIP-8	Tube / 50	YYWW TF2106 Lot ID
TF2106-TAU	SOIC-8(N)	Tube / 100	YYWW TF2106 Lot ID
TF2106-TAH	SOIC-8(N)	Tape & Reel / 2500	

Typical Application



Pin Diagrams



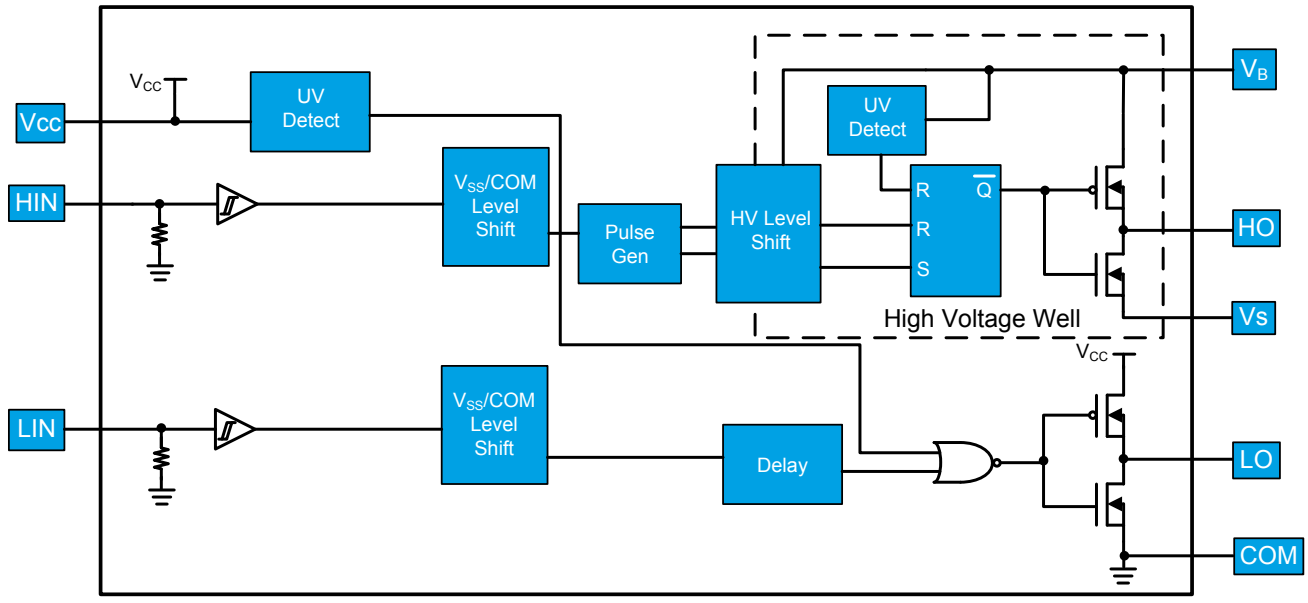
Top View: SOIC-8(N), PDIP-8

TF2106

Pin Descriptions

PIN NAME	PIN DESCRIPTION
HIN	Logic input for high-side gate driver output, in phase with HO
LIN	Logic input for low side gate driver output, out of phase with LO
COM	Low-side return
LO	Low-side gate drive output
V_{CC}	Low-side and logic fixed supply
V_S	High-side floating supply return
HO	High-side gate drive output
V_B	High-side floating supply

Functional Block Diagram



Absolute Maximum Ratings *(NOTE1)*

V_B - High side floating supply voltage.....-0.3V to +624V
V_S - High side floating supply offset voltage.....V_B-24V to V_B+0.3V
V_{HO} - High side floating output voltage.....V_S-0.3V to V_B+0.3V
dV_S / dt - Offset supply voltage transient.....50 V/ns

V_{CC} - Low side and logic fixed supply voltage.....-0.3V to +24V
V_{LO} - Low side output voltage.....-0.3V to V_{CC}+0.3V
V_{IN} - Logic input voltage (HIN and LIN).....- 0.3V to V_{cc}+0.3V

P_D - Package power dissipation at $T_A \leq 25$ °C
SOIC-8.....0.625W
PDIP-8.....1.0W

NOTE1 *Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.*

SOIC-8(N) Thermal Resistance ***(NOTE2)***
θ_{JA}.....200 °C/W
PDIP-8Thermal Resistance ***(NOTE2)***
θ_{JA}.....125 °C/W
T_J - Junction operating temperature .....+150 °C
T_L - Lead temperature (soldering, 10s) ..... +300 °C
T_{stg} - Storage temperature range .....-55 °C to +150 °C

NOTE2 *When mounted on a standard JEDEC 2-layer FR-4 board.*

Recommended Operating Conditions

Symbol	Parameter	MIN	MAX	Unit
V_B	High side floating supply absolute voltage	V_S + 10	V_S + 20	V
V_S	High side floating supply offset voltage	***(NOTE 3)***	600	V
V_{HO}	High side floating output voltage	V_S	V_B	V
V_{CC}	Low side and logic fixed supply voltage	10	20	V
V_{LO}	Low side output voltage	COM	V_{CC}	V
V_{IN}	Logic input voltage	COM	V_{CC}	V
T_A	Ambient temperature	-40	125	°C

NOTE3 *Logic operational for V_S of -5 V to +600 V. Logic state held for V_S of -5 V to -V_{BS}.*

DC Electrical Characteristics *(NOTE4)*

V_{BIAS} (V_{CC}, V_{BS}) = 15V, and T_A = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	MIN	TYP	MAX	Unit
V_{IH}	Logic "1" input voltage	V_{CC} = 10 V to 20 V	2.5			V
V_{IL}	Logic "0" input voltage				0.6	
V_{OH}	High level output voltage, V_{BIAS} - V_O	I_O = 2mA		0.05	0.2	
V_{OL}	Low level output voltage, V_O	I_O = 2mA		0.02	0.1	
I_{LK}	Offset supply leakage current	VB = VS = 600V			50	µA
I_{BSQ}	Quiescent V_{BS} supply current	V_{IN} = 0V or 5V	20	75	130	
I_{CCQ}	Quiescent V_{CC} supply current	V_{IN} = 0V or 5V	60	120	180	
I_{IN+}	Logic "1" input bias current	V_{IN} = 5V		5	20	
I_{IN-}	Logic "0" input bias current	V_{IN} = 0V			2.0	
V_{BSUV+}	V_{BS} supply under-voltage positive going threshold		8.0	8.9	9.8	V
V_{BSUV-}	V_{BS} supply under-voltage negative going threshold		7.4	8.2	9.0	
V_{CCUV+}	V_{CC} supply under-voltage positive going threshold		8.0	8.9	9.8	
V_{CCUV-}	V_{CC} supply under-voltage negative going threshold		7.4	8.2	9.0	
V_{CCUVH}	Hysteresis		0.3	0.7		V
V_{BSUVH}						
I_{O+}	Output high short circuit pulsed current	V_O = 0V, PW ≤ 10 µs	130	290		mA
I_{O-}	Output low short circuit pulsed current	V_O = 15V, PW ≤ 10 µs	270	600		

NOTE4 *The V_{IN}, V_{Th}, I_{IN} parameters are referenced to COM and are applicable to the two logic input pins: HIN and LIN. The V_0 and I_0 parameters are referenced to COM and are applicable to the respective output pins: HO and LO.*

AC Electrical Characteristics

V_{BIAS} (V_{CC}, V_{BS}) = 15V, C_L = 1000 pF, and T_A = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	MIN	TYP	MAX	Unit
t_{ON}	Turn-on propagation delay	V_S = 0V		220	300	ns
t_{OFF}	Turn-off propagation delay	V_S = 0 V or 600V		200	280	
t_{DM}	Delay matching			0	30	
t_r	Turn-on rise time	V_S = 0V		100	220	
t_f	Turn-off fall time			35	80	

Timing Waveforms

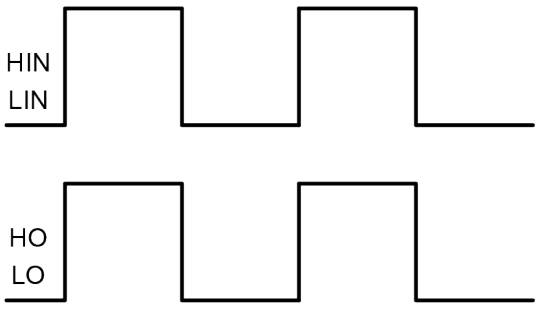


Figure 1. Input / Output Timing Diagram

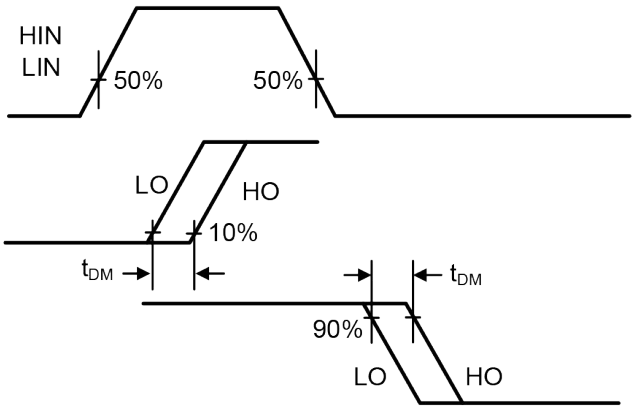


Figure 2. Delay Matching Waveform Definitions

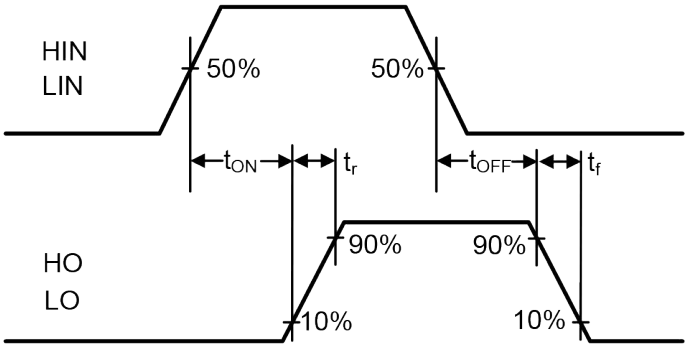
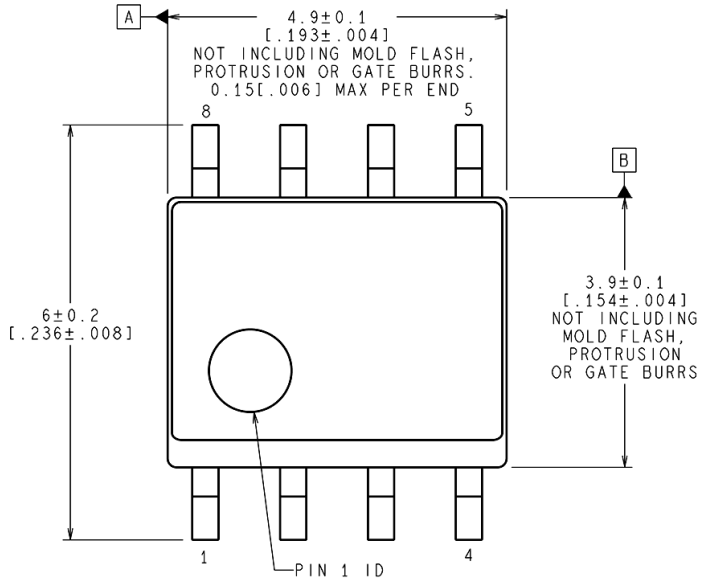
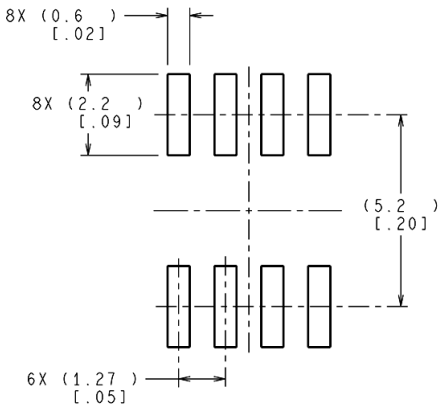


Figure 3. Switching Time Waveform Definitions

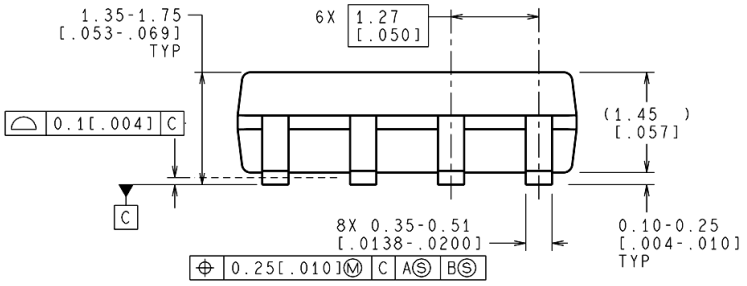
Package Dimensions (SOIC-8N)

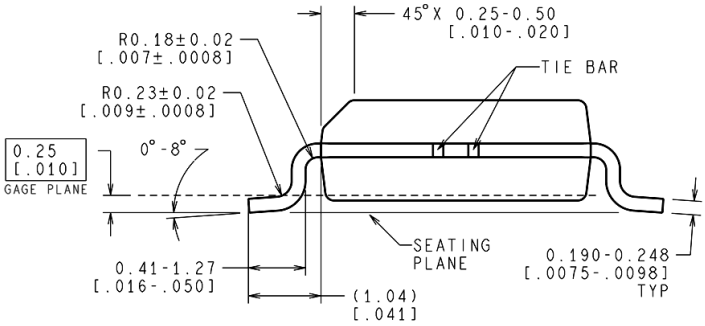
Please contact support@tfsemi.com for package availability.





RECOMMENDED LAND PATTERN





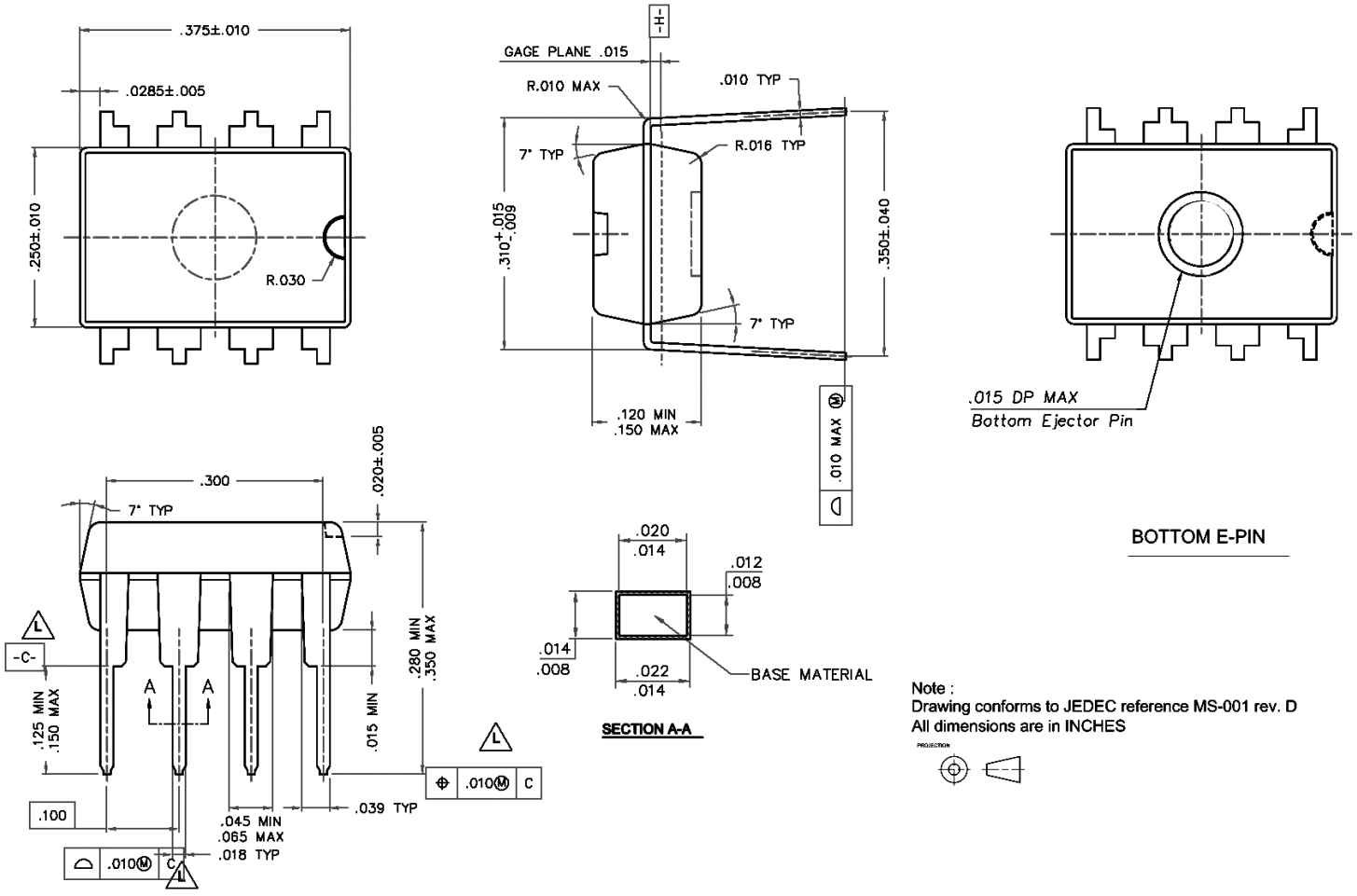
NOTES: UNLESS OTHERWISE SPECIFIED

1. REFERENCE JEDEC REGISTRATION MS-012, VARIATION AA.

CONTROLLING DIMENSION IS MILLIMETER
VALUES IN [ ] ARE INCHES
DIMENSIONS IN ( ) FOR REFERENCE ONLY

Package Dimensions (PDIP-8)

Please contact support@tfsemi.com for package availability.



Notes

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