



SANYO Semiconductors

DATA SHEET

TND512MD

 ExPD(Excellent-Performance Power & RF Device)

3-phase Motor Drive Application

Features

- 3-phase high side driver.
- Monolithic structure.
- Allows simplified configuration of driver circuit.
- Withstand voltage of 600V is assured.
- Fully compatible input to LSTTL/CMOS.
- High-speed switching.
- Output current : 170mA Source, 340mA Sink.

Specifications

Absolute Maximum Ratings at Ta=25°C (All voltage parameters are absolute voltage referenced to GND)

| Parameter | Symbol | Conditions | Ratings | Unit |
|--|------------------|---|---|------|
| High Side Floating Supply Voltage | V _H | | -0.3 to 625 | V |
| High Side Floating Supply Offset Voltage | V _{FG} | | V _H -25 to V _H +0.3 | V |
| High Side Output Voltage | V _{OUT} | | V _{FG} -0.3 to V _H +0.3 | V |
| Logic Supply Voltage | V _{DD} | | -0.3 to 25 | V |
| Logic Input Voltage(UIN, VIN, WIN) | V _{IN} | | -0.3 to V _{DD} +0.3 | V |
| Allowable Power Dissipation | P _D | When mounted on ceramic substrate (250mm ² ×0.8mm) | 0.9 | W |
| Junction Temperature | T _J | | -55 to +150 | °C |
| Storage Temperature | T _{stg} | | -55 to +150 | °C |

Recommended Operating Conditions at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|--|------------------|------------|--|------|
| High Side Floating Supply Voltage | V _H | | V _{FG} +10 to V _{FG} +20 | V |
| High Side Floating Supply Offset Voltage | V _{FG} | | 0 to 600 | V |
| High Side Output Voltage | V _{OUT} | | V _{FG} to V _H | V |
| Logic Supply Voltage | V _{DD} | | +10 to +20 | V |
| Logic Input Voltage(UIN, VIN, WIN) | V _{IN} | | 0 to V _{DD} | V |
| Ambient Temperature | Topr | | -40 to +125 | °C |

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TND512MD

AC Characteristics at Ta=25°C (VDD=VH-VFG=15V, CL=1000pF)

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|-------------------|--|---------|-----|-----|------|
| | | | min | typ | max | |
| Turn-ON Delay Time | t _{on} | V _{FG} =0V | | 155 | | ns |
| Turn-OFF Delay Time | t _{off} | V _{FG} =600V | | 135 | | ns |
| Turn-ON Rise Time | t _r | | | 110 | | ns |
| Turn-OFF Fall Time | t _f | | | 40 | | ns |
| Turn-ON Delay Matching of U, V and W * | Mt _{on} | t _{onu} -t _{onv} , t _{onv} -t _{onw} , t _{onw} -t _{onu} | | 30 | | ns |
| Turn-OFF Delay Matching of U, V and W * | Mt _{off} | t _{offu} -t _{offv} , t _{offv} -t _{offw} , t _{offw} -t _{offu} | | 30 | | ns |

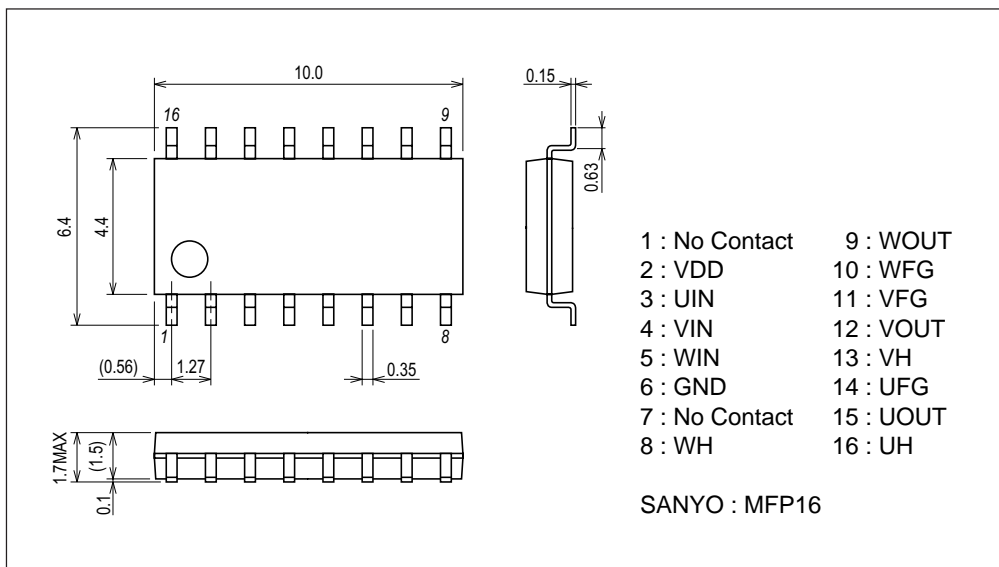
DC Characteristics at Ta=25°C (VDD=VH-VFG=15V)

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--|--------------------|---|---------|-----|-----|------|
| | | | min | typ | max | |
| Logic "1" Input Voltage | V _{IH} | V _{DD} =10 to 20V | 3.0 | | | V |
| Logic "0" Input Voltage | V _{IL} | V _{DD} =10 to 20V | | | 0.8 | V |
| High-level Output Voltage, V _{BIAS} -V _O | V _{OH} | V _{IN} =V _{IH} , I _O =0A | | | 0.1 | V |
| Low-level Output Voltage, V _O | V _{OL} | V _{IN} =V _{IL} , I _O =0A | | | 0.1 | V |
| Offset Supply Leakage Current | I _{LK} | V _H =V _{FG} =600V | | | 10 | μA |
| Quiescent V _H Supply Current | I _{QH} | V _{IN} =0V or V _{DD} | | 50 | 100 | μA |
| Quiescent V _{DD} Supply Current | I _{QDD} | V _{IN} =0V or V _{DD} | | 140 | 230 | μA |
| Logic "1" Input Bias Current | I _{IN+} | V _{IN} =V _{DD} | | 20 | 55 | μA |
| Logic "0" Input Bias Current | I _{IN-} | V _{IN} =0V | | | 1 | μA |
| V _H Supply Undervoltage Positive Going Threshold | V _{HUV+} | | 7.6 | 8.9 | 9.9 | V |
| V _H Supply Undervoltage Negative Going Threshold | V _{HUV-} | | 6.7 | 8.1 | 9.5 | V |
| V _{DD} Supply Undervoltage Positive Going Threshold | V _{DDUV+} | | 7.6 | 8.9 | 9.9 | V |
| V _{DD} Supply Undervoltage Negative Going Threshold | V _{DDUV-} | | 6.7 | 8.1 | 9.5 | V |
| Output High Short Circuit Pulsed Current | I _{O+} | V _{OUT} =0V, V _{IN} =15V, PW≤10μs | 170 | 200 | | mA |
| Output Low Short Circuit Pulsed Current | I _{O-} | V _{OUT} =15V, V _{IN} =0V, PW≤10μs | 340 | 400 | | mA |

Package Dimensions

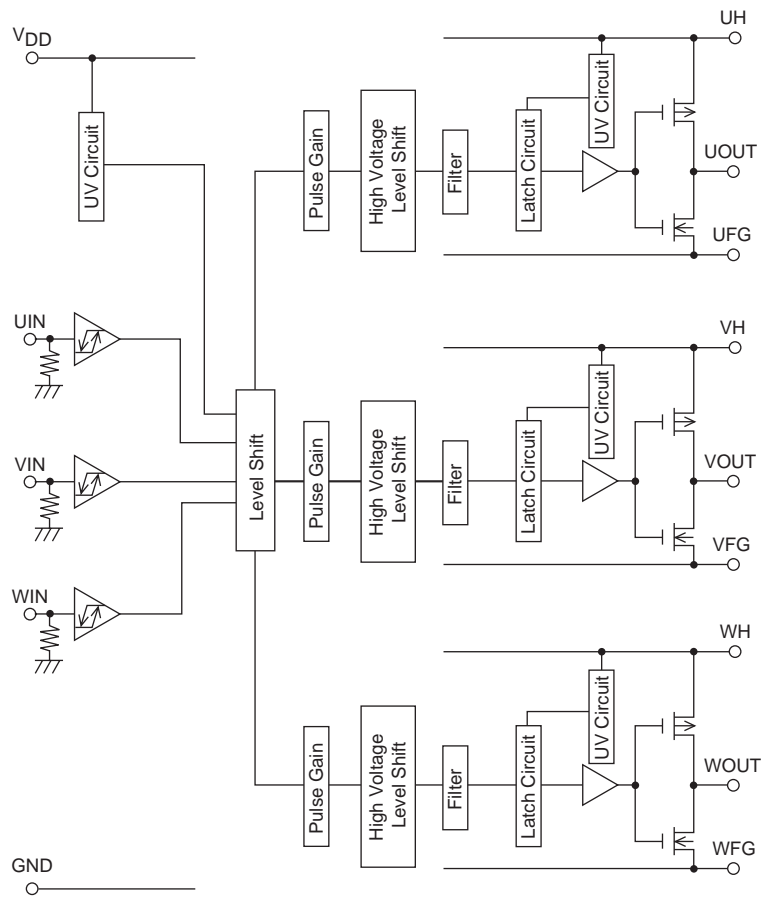
unit : mm (typ)

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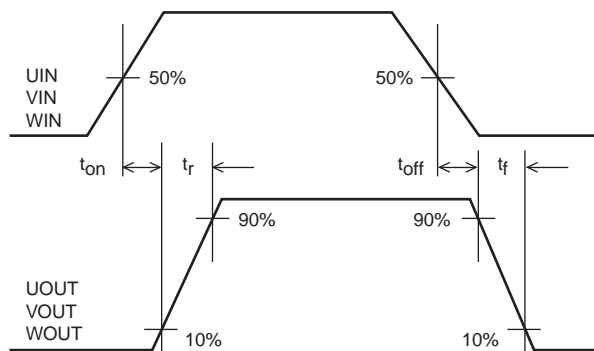
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Block Diagram

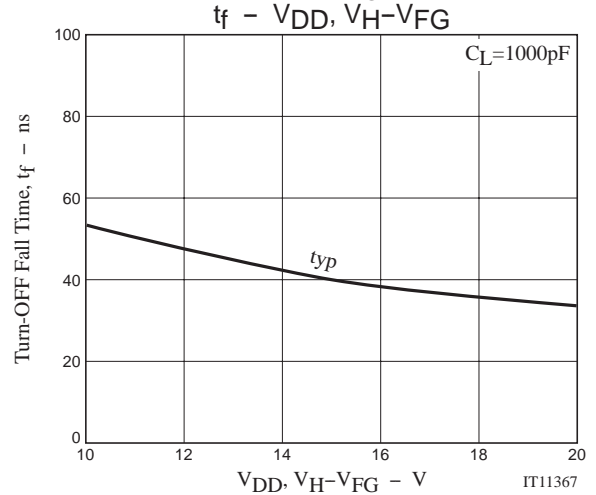
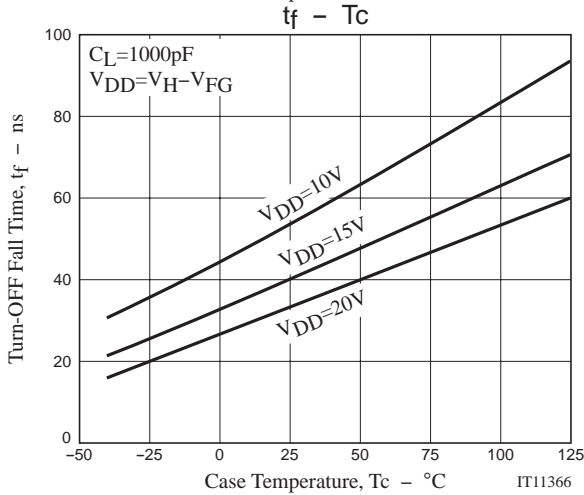
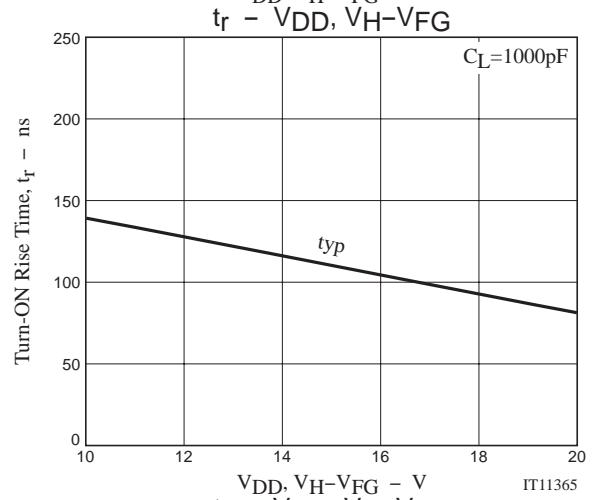
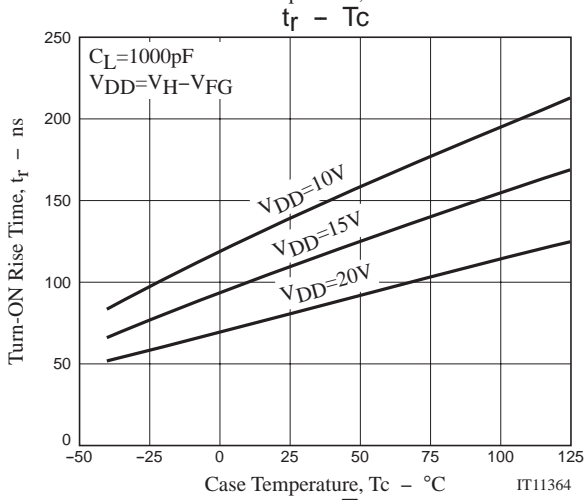
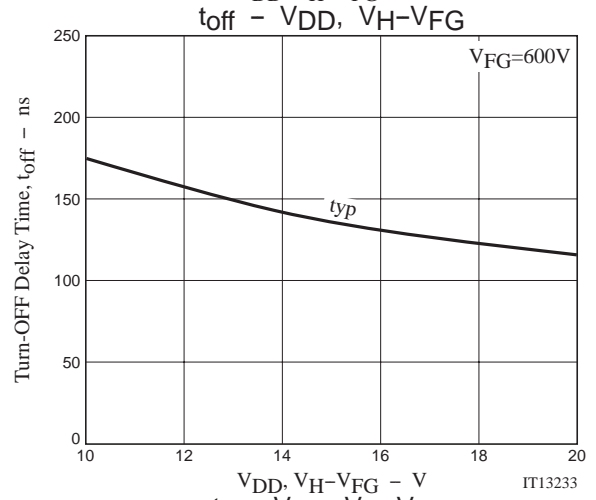
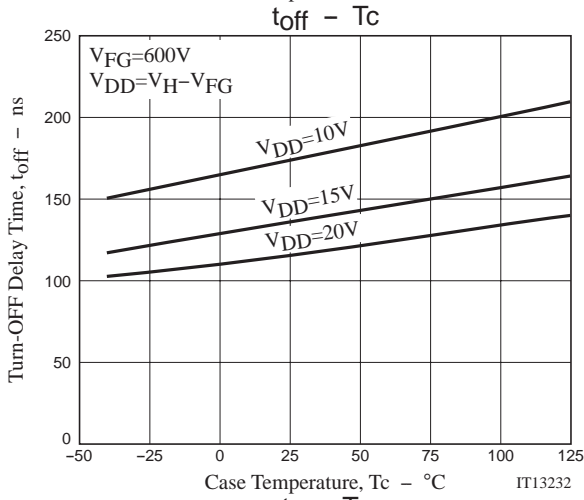
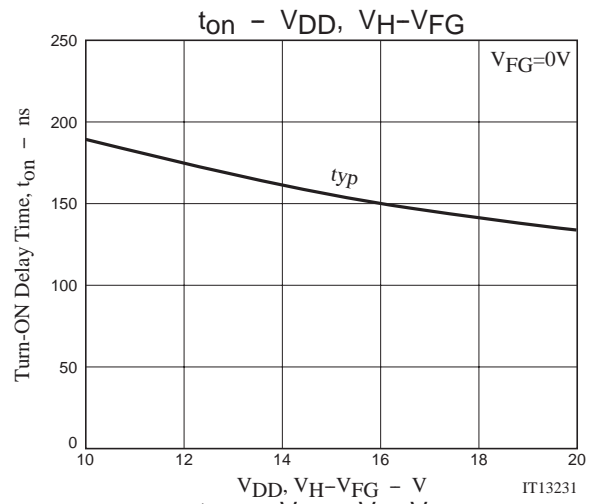
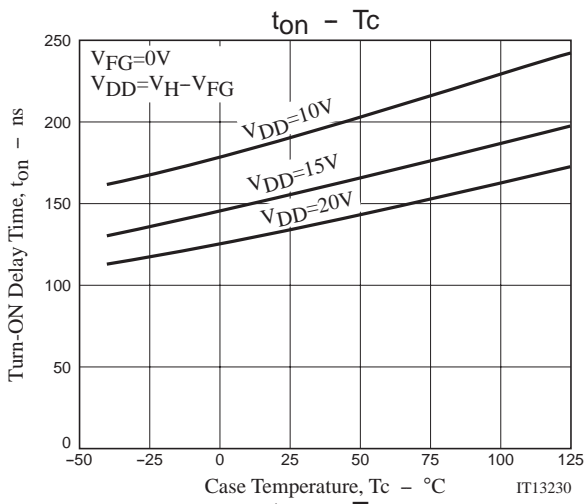


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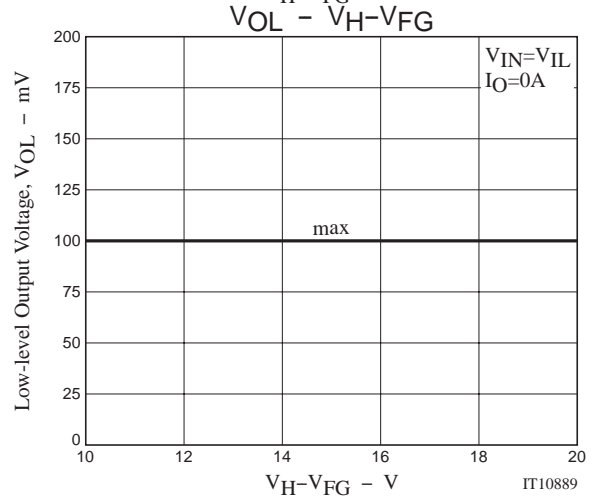
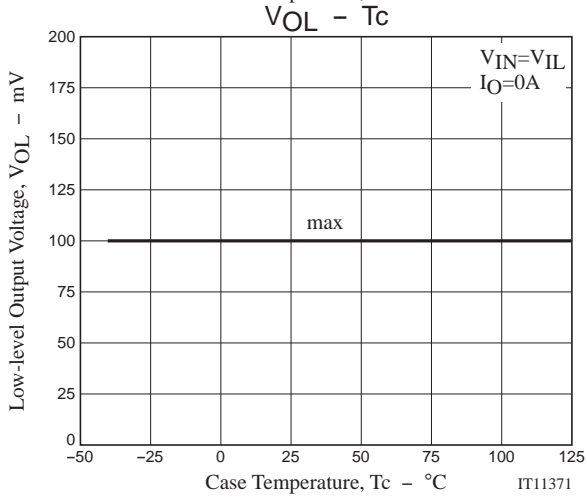
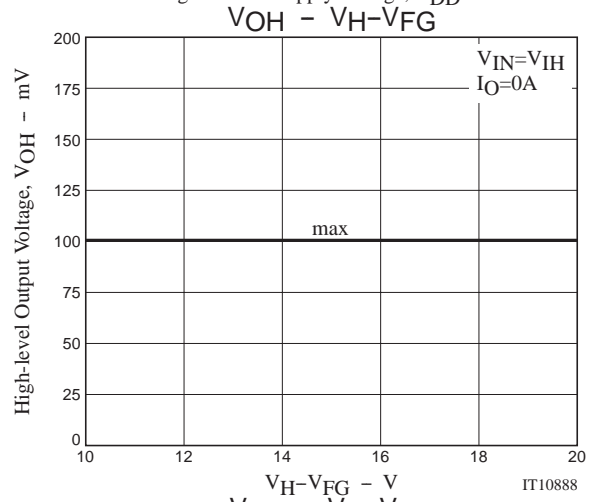
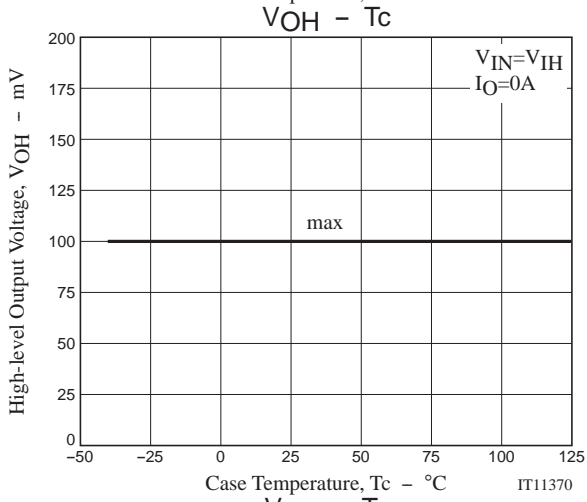
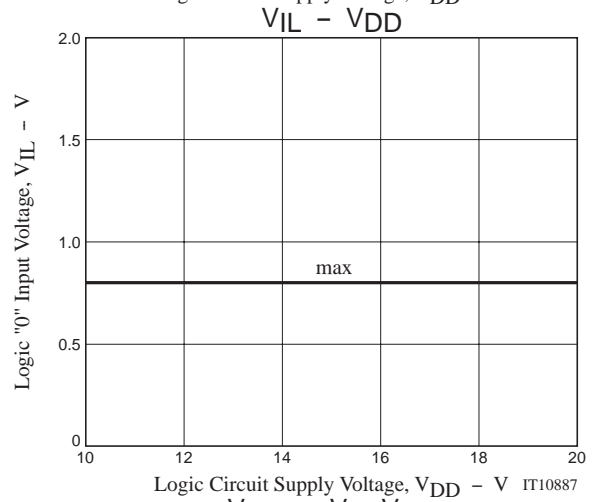
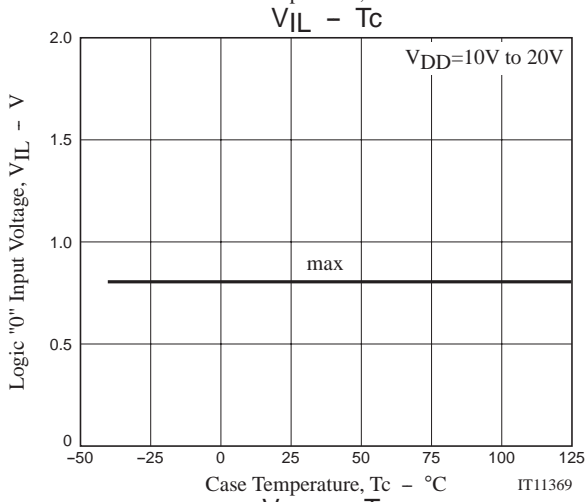
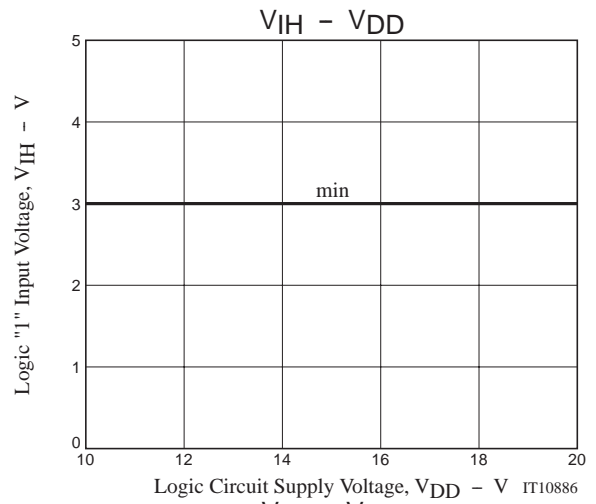
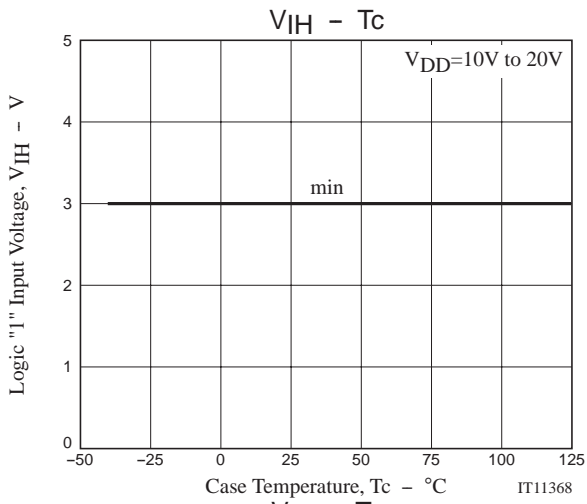
Switching Time Waveform Definition



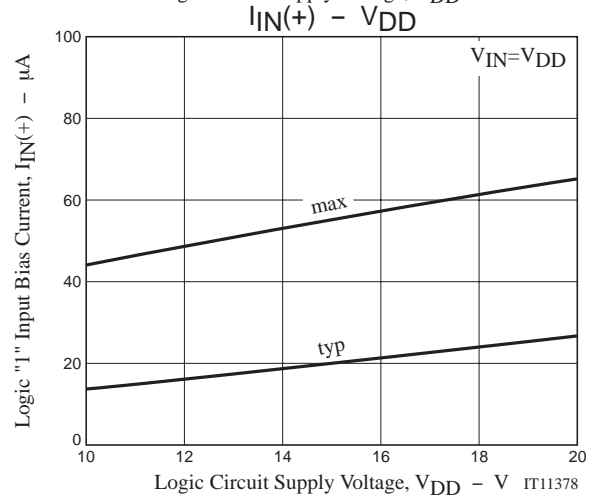
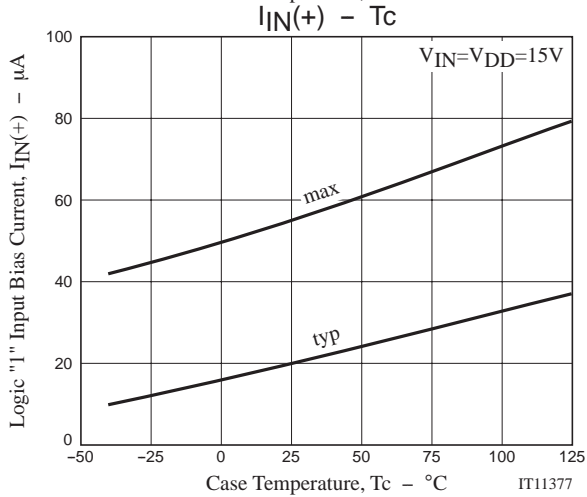
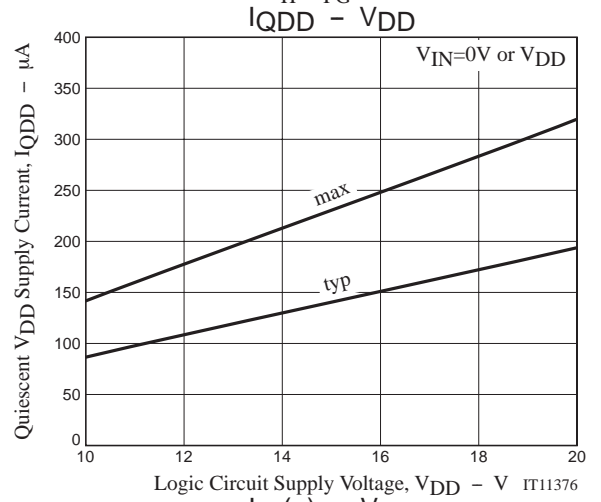
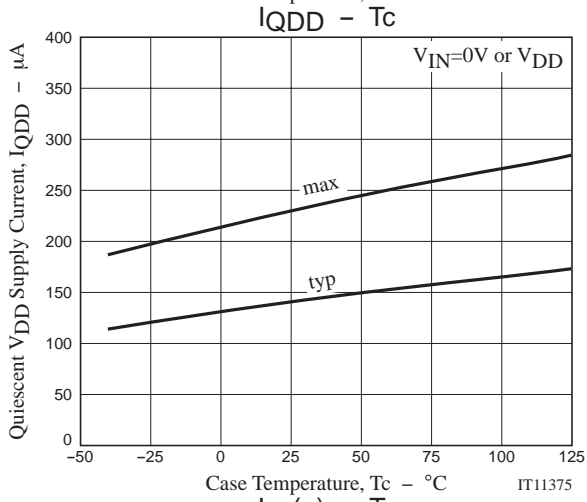
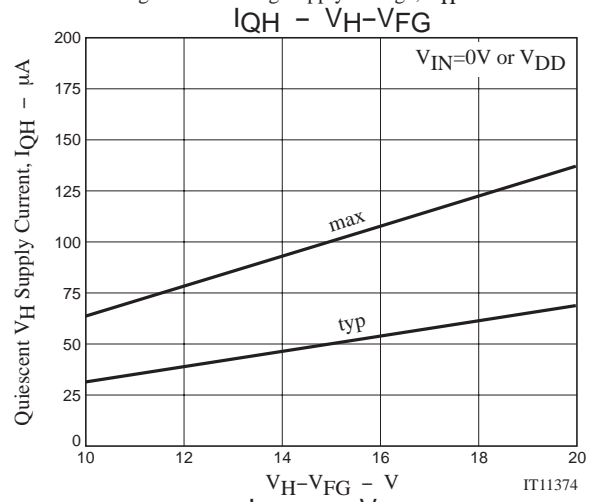
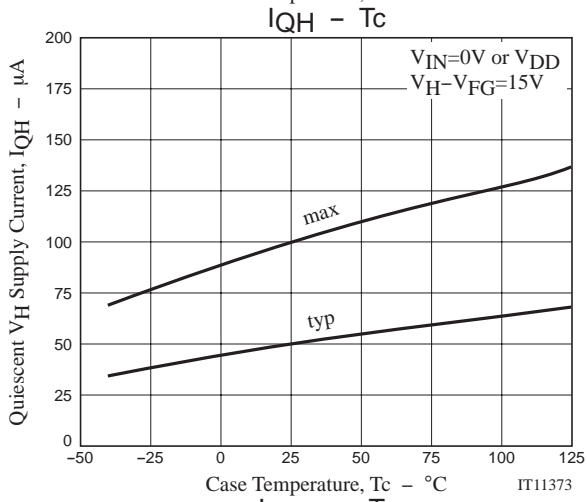
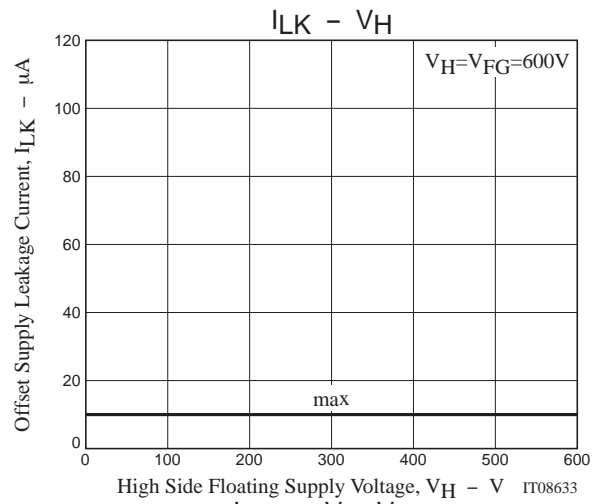
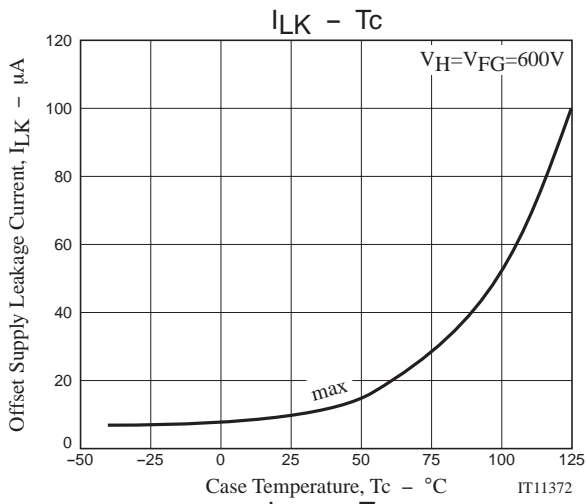
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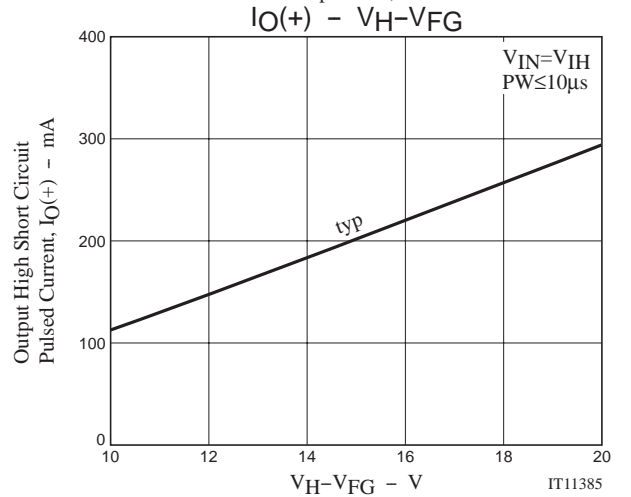
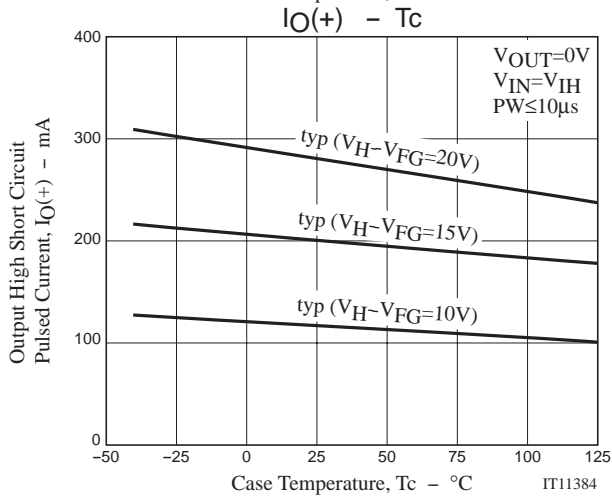
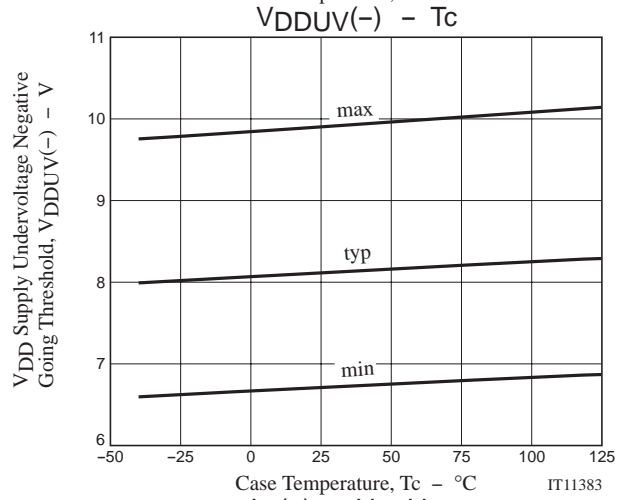
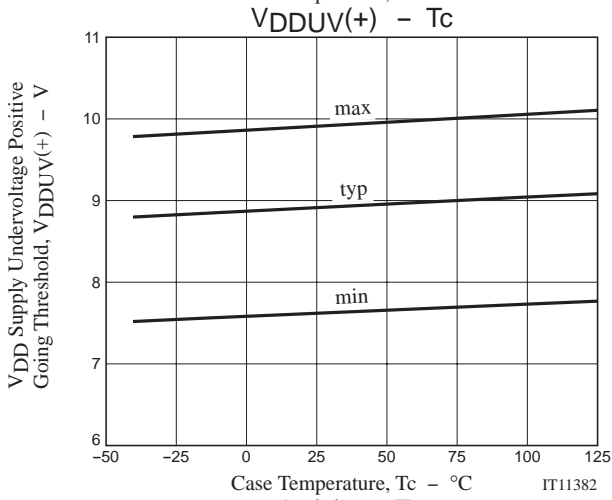
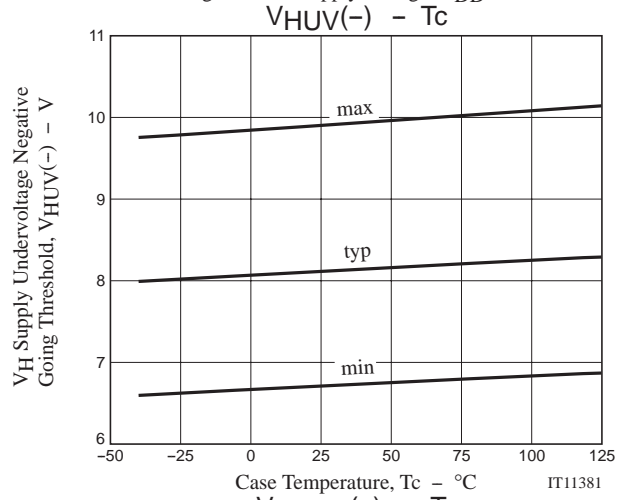
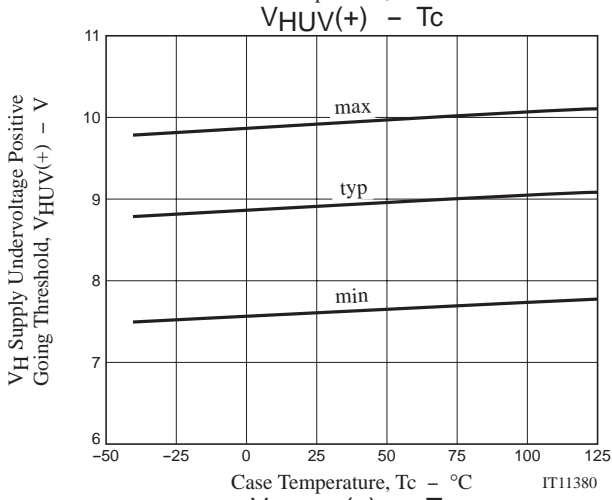
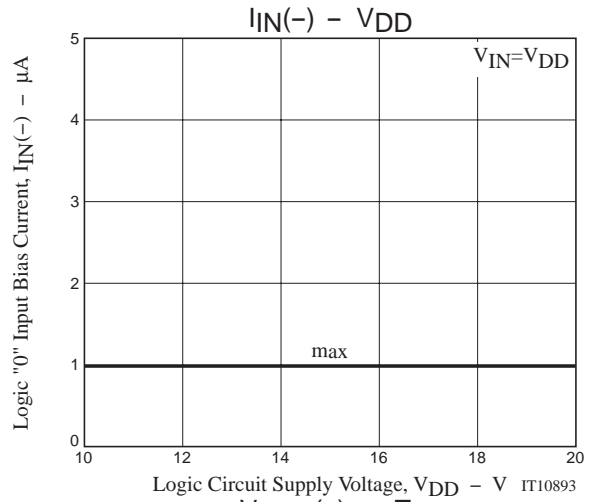
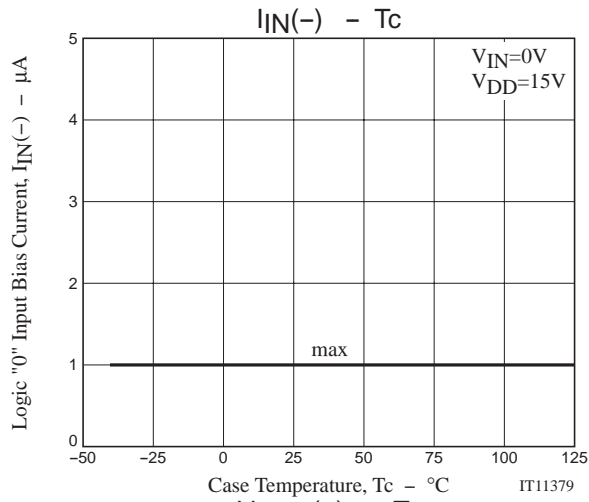
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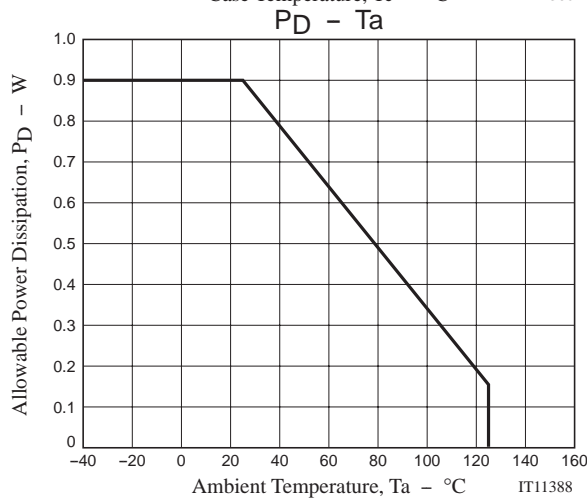
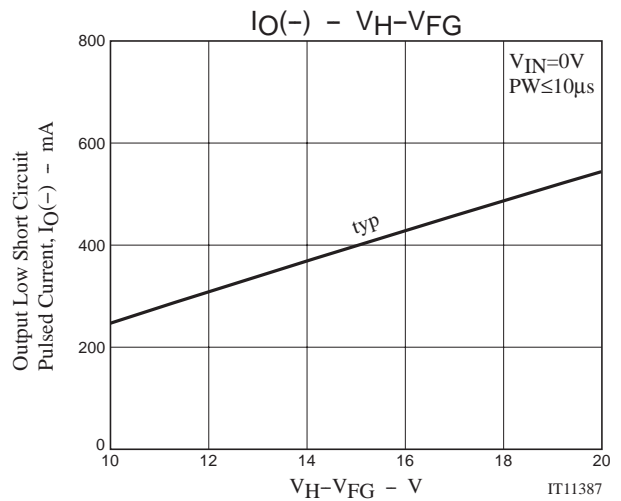
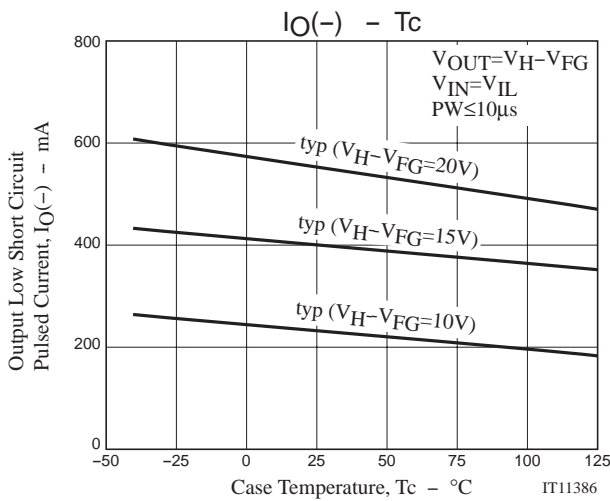
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