



TND505MD

General Purpose Driver for Applications Including PDP Sustain Pulse Drive, DC / AC Motor Drive, Ballast, Battery Charger, High Frequency Switching Power Supply, Induction Heating, and Switching Amplifiers

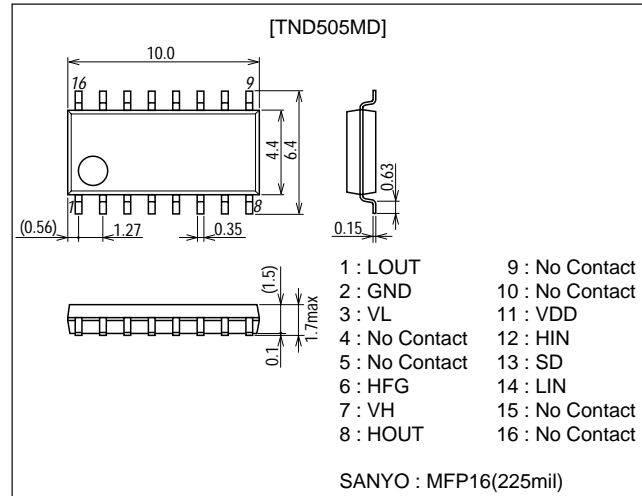
Features

- Monolithic structure.
- Allows simplified configuration of driver circuit.
- Withstand voltage of 600V is assured.
- Shutdown protection function.
- Stable-start circuit
(Low-side outputs preference circuit).
- Low-side output-watching circuit.
- Fully compatible input to LSTTL/CMOS.
- Fast switching time(120ns at 1000pF load).
- Propagation delay is about 150ns.
- Output current : 220mA Source, 450mA Sink.

Package Dimensions

unit : mm

2198



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 _{HFG} | | V _H -25 to V _H +0.3 | V |
| High Side Output Voltage | V _{HOUT} | | V _{HFG} -0.3 to V _H +0.3 | V |
| Low Side Supply Voltage | V _L | | -0.3 to 25 | V |
| Low Side Output Voltage | V _{LOUT} | | -0.3 to V _L +0.3 | V |
| Logic Supply Voltage | V _{DD} | | -0.3 to 25 | V |
| Logic Input Voltage(HIN, LIN, SD) | V _{IN} | | -0.3 to V _{DD} +0.3 | V |
| Allowable Power Dissipation | P _D | Mounted on a ceramic board | 0.9 | W |
| Junction Temperature | T _J | | -55 to +150 | °C |
| Storage Temperature | T _{stg} | | -55 to +150 | °C |

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Recommended Operating Conditions at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|--|-------------------|------------|--|------|
| High Side Floating Supply Voltage | V _H | | V _{HFG} +10 to V _{HFG} +20 | V |
| High Side Floating Supply Offset Voltage | V _{HFG} | | 0 to 600 | V |
| High Side Output Voltage | V _{HOUT} | | V _{HFG} to V _H | V |
| Low Side Supply Voltage | V _L | | 10 to +20 | V |
| Low Side Output Voltage | V _{LOUT} | | 0 to V _L | V |
| Logic Supply Voltage | V _{DD} | | +5 to +20 | V |
| Logic Input Voltage(HIN, LIN, SD) | V _{IN} | | 0 to V _{DD} | V |
| Ambient Temperature | Topr | | -40 to +125 | °C |

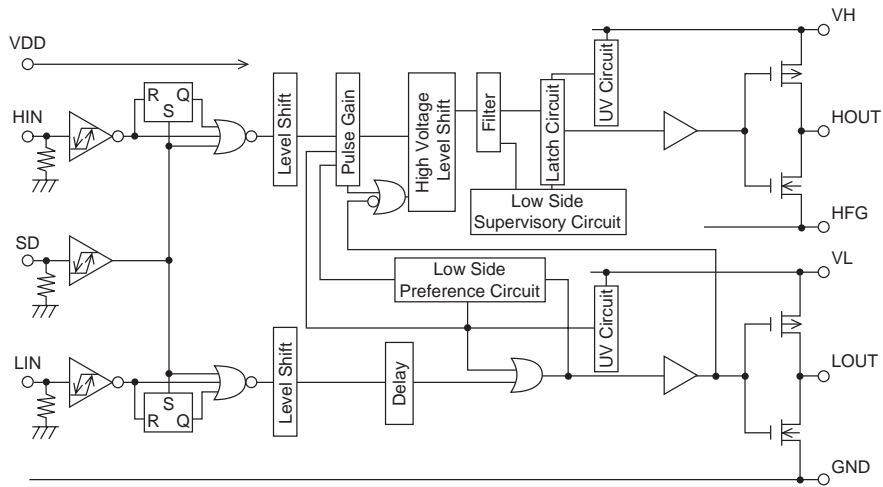
AC Characteristics at Ta=25°C (V_{DD}=V_L=V_{HFG}=15V, C_L=1000pF)

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|------------------------------------|-------------------|--------------------------------------|---------|-----|-----|------|
| | | | min | typ | max | |
| Turn-ON Delay Time | t _{on} | V _{HFG} =0V | 105 | 150 | 195 | ns |
| Turn-OFF Delay Time | t _{off} | V _{HFG} =600V | 84 | 120 | 156 | ns |
| Shutdown Delay Time | tsd | V _{HFG} =600V | | 120 | | ns |
| Turn-ON Rise Time | t _r | | | 120 | | ns |
| Turn-OFF Fall Time | t _f | | | 60 | | ns |
| Delay Matching, HS and LS Turn-ON | M _{ton} | H _{ton} -L _{ton} | | 15 | | ns |
| Delay Matching, HS and LS Turn-OFF | M _{toff} | H _{toff} -L _{toff} | | 15 | | ns |

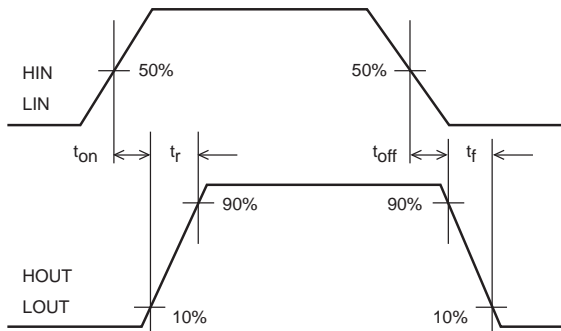
DC Characteristics at Ta=25°C, (V_{DD}=V_L=V_{HFG}=15V)

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--|-------------------|---|---------|-----|-----|------|
| | | | min | typ | max | |
| Logic "1" Input Voltage | V _{IH} | V _{DD} =5V | 3.2 | | | V |
| | | V _{DD} =10V | 6.4 | | | V |
| | | V _{DD} =15V | 9.5 | | | V |
| | | V _{DD} =20V | 12.8 | | | V |
| Logic "0" Input Voltage | V _{IL} | V _{DD} =5V | | | 1.5 | V |
| | | V _{DD} =10V | | | 3.7 | V |
| | | V _{DD} =15V | | | 5.8 | V |
| | | V _{DD} =20V | | | 7.7 | 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 _{HFG} =600V | | | 10 | μA |
| Quiescent V _H Supply Current | I _{QH} | V _{IN} =0V or V _{DD} | | 35 | 60 | μA |
| Quiescent V _L Supply Current | I _{QL} | V _{IN} =0V or V _{DD} | | 120 | 200 | μA |
| Quiescent V _{DD} Supply Current | I _{QDD} | V _{IN} =0V or V _{DD} | | 5 | 20 | 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 _L Supply Undervoltage Positive Going Threshold | V _{LUV+} | | 7.6 | 8.9 | 9.9 | V |
| V _L Supply Undervoltage Negative Going Threshold | V _{LUV-} | | 6.7 | 8.1 | 9.5 | V |
| Output High Short Circuit Pulsed Current | I _{O+} | V _{OUT} =0V, V _{IN} =15V, PW≤10μs | 220 | 250 | | mA |
| Output Low Short Circuit Pulsed Current | I _{O-} | V _{OUT} =15V, V _{IN} =0V, PW≤10μs | 450 | 500 | | mA |

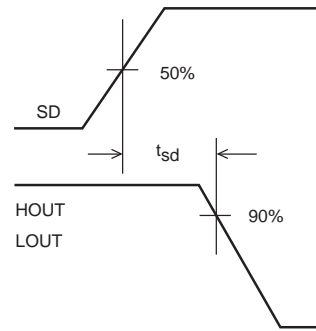
Functional Block Diagram



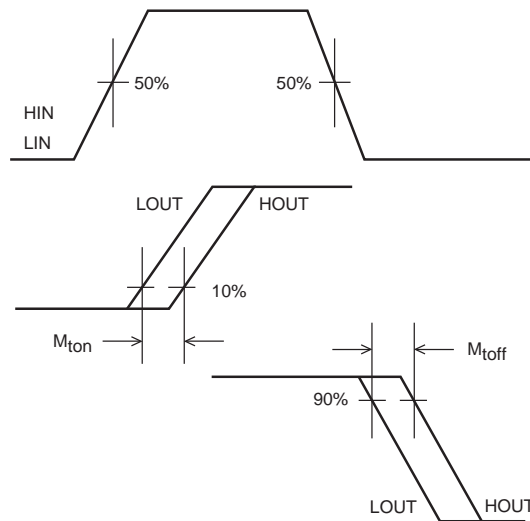
Switching Time Waveform Definition



Shutdown Waveform Definition

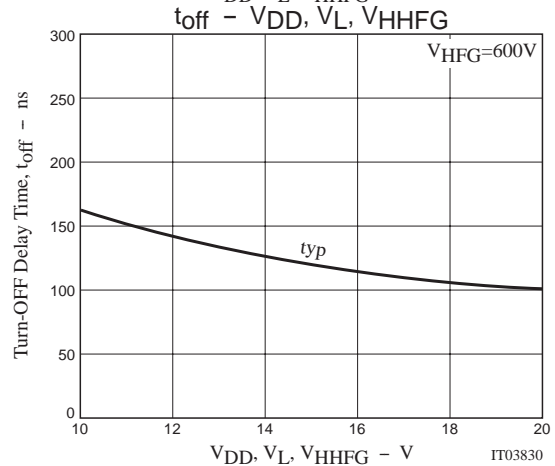
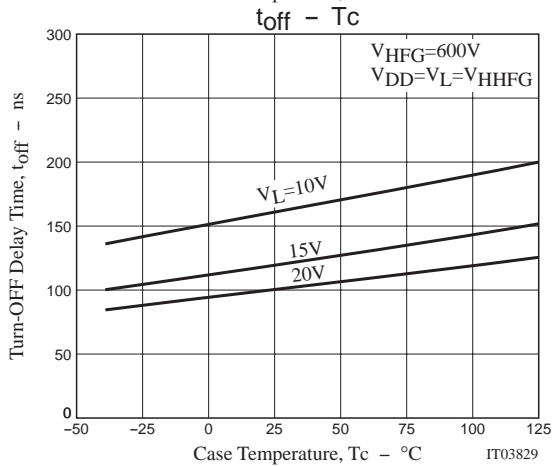
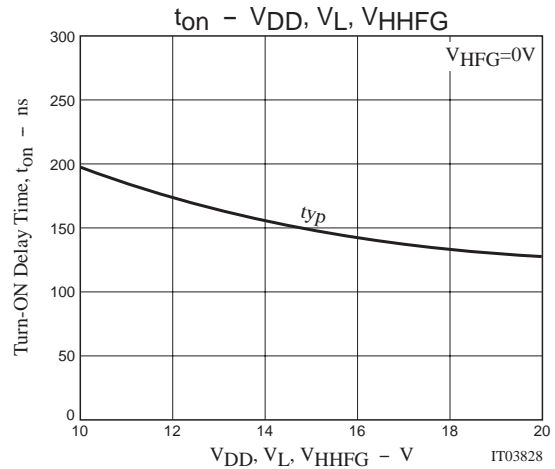
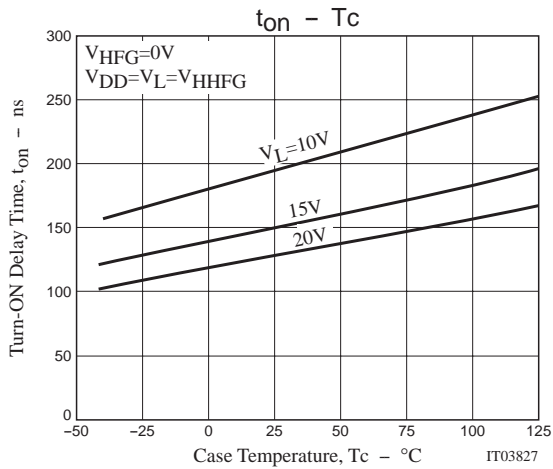
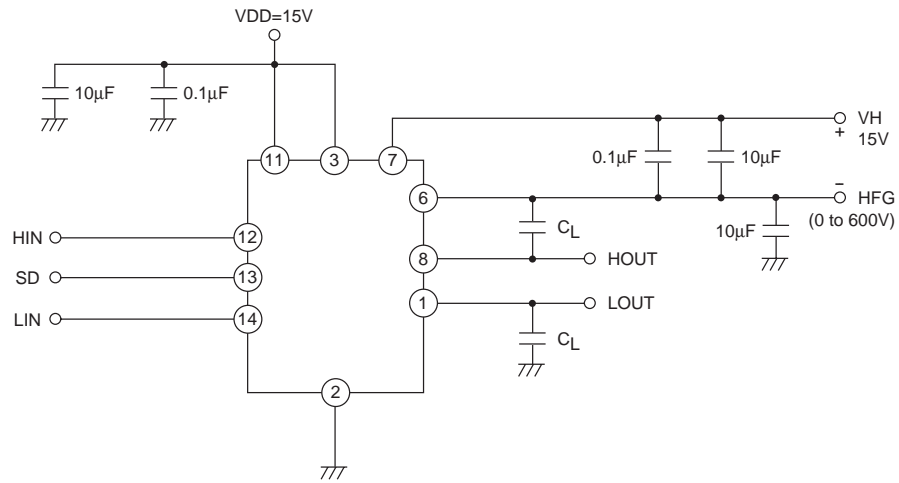


Delay Matching Waveform Definition

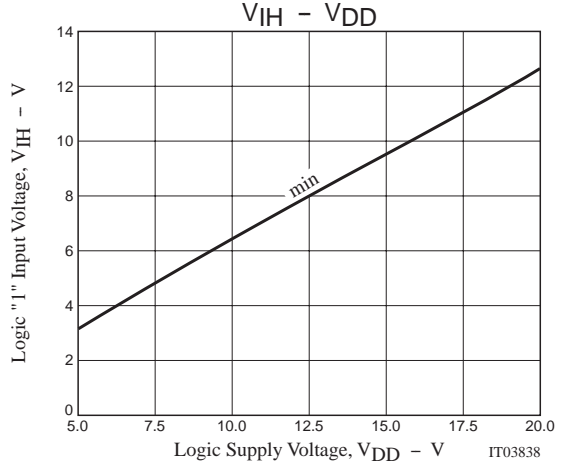
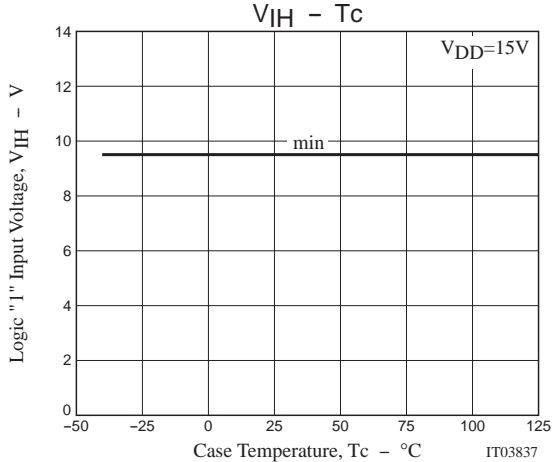
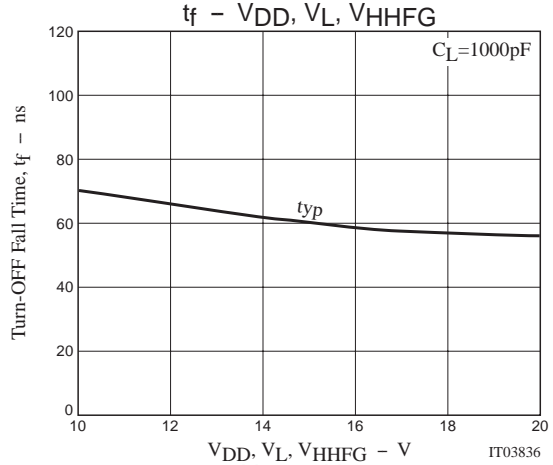
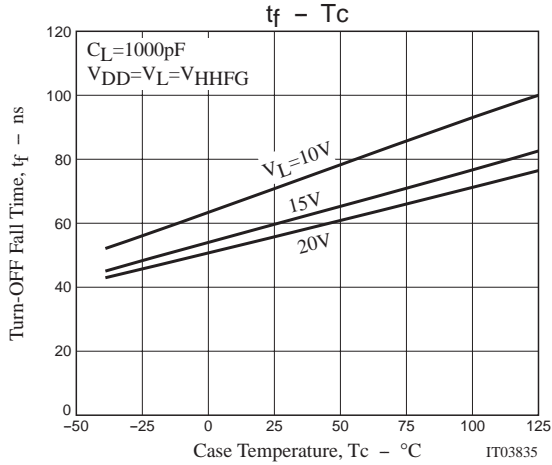
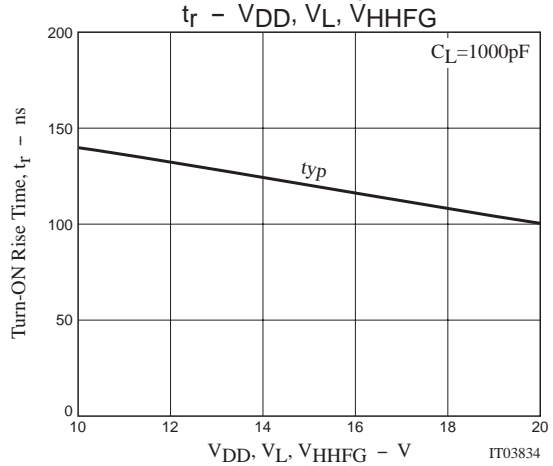
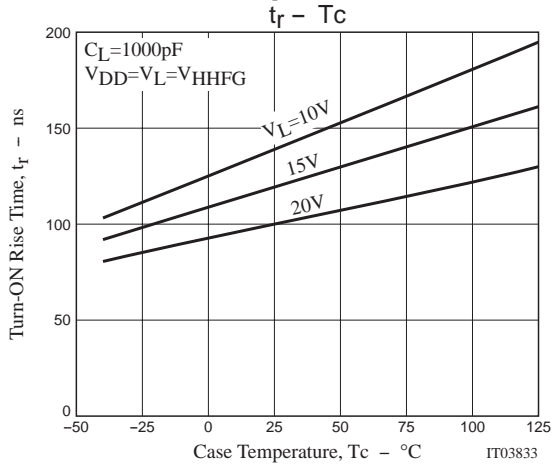
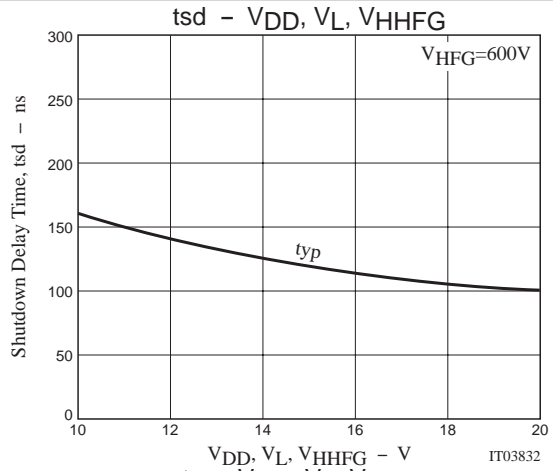
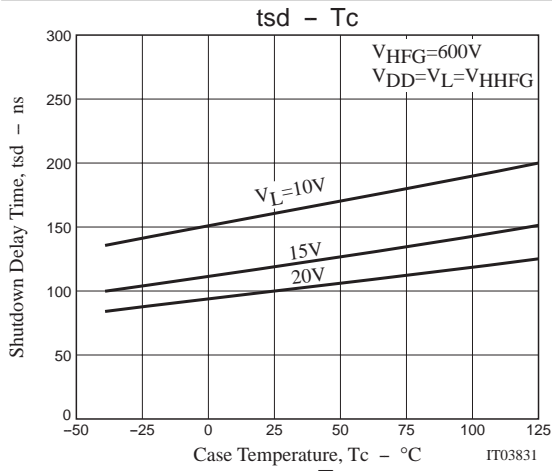


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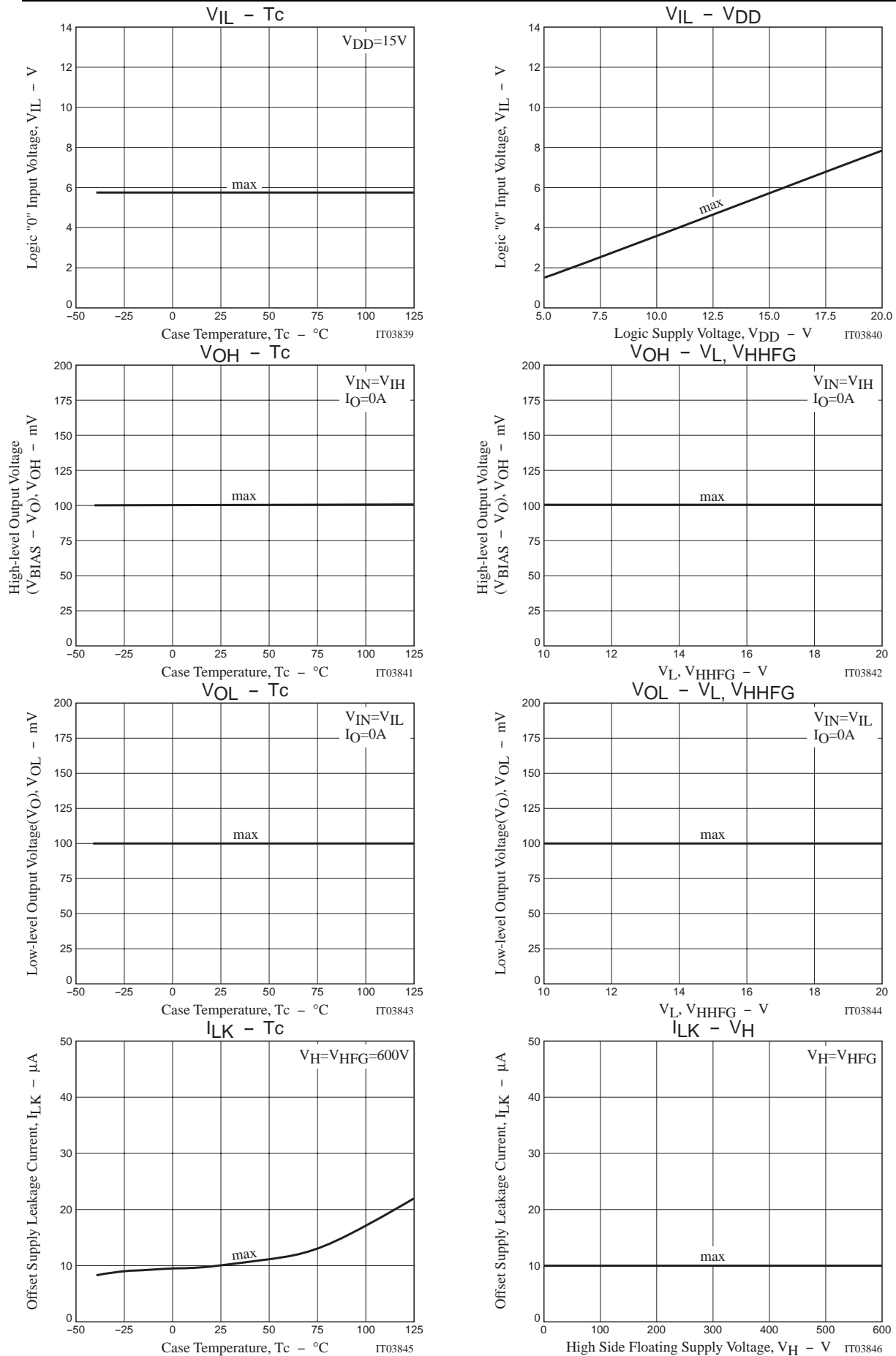
Switching Time Test Circuit



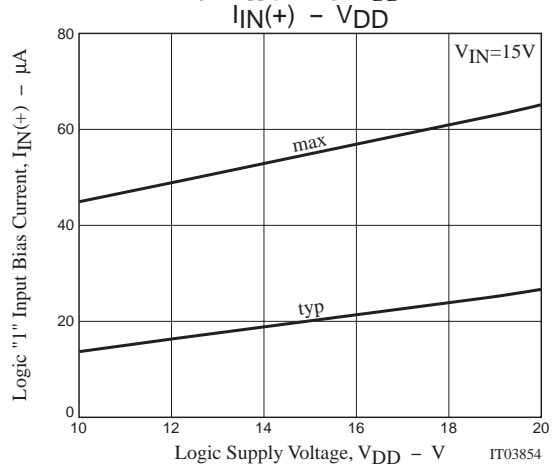
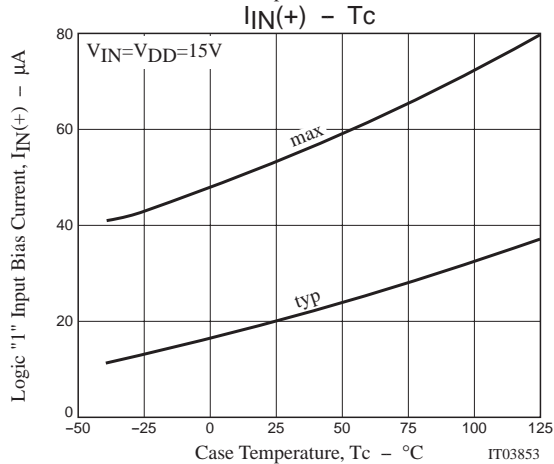
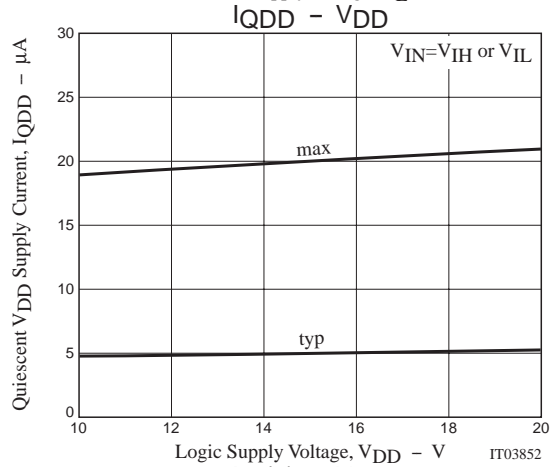
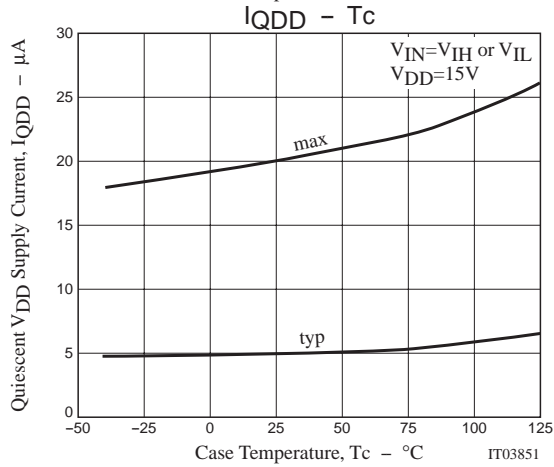
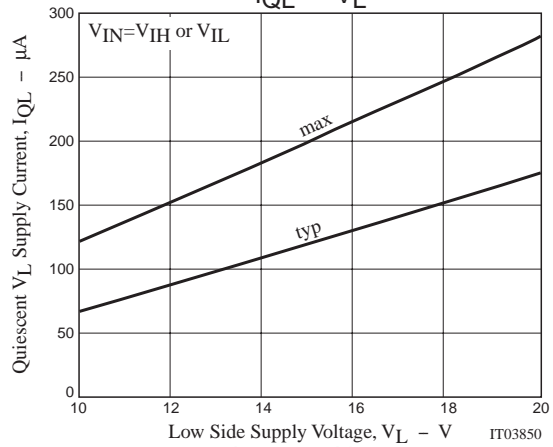
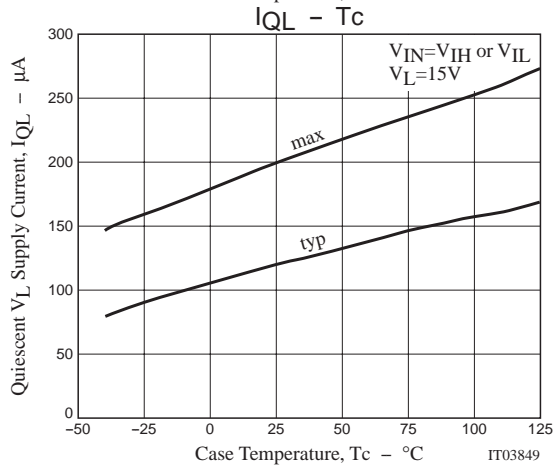
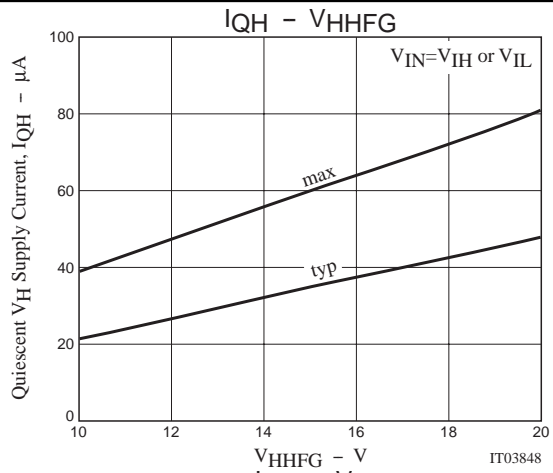
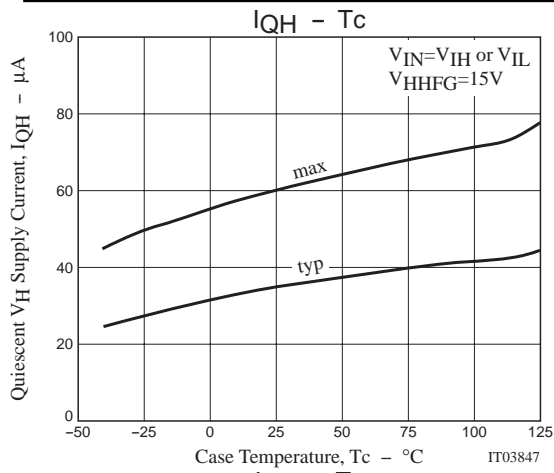
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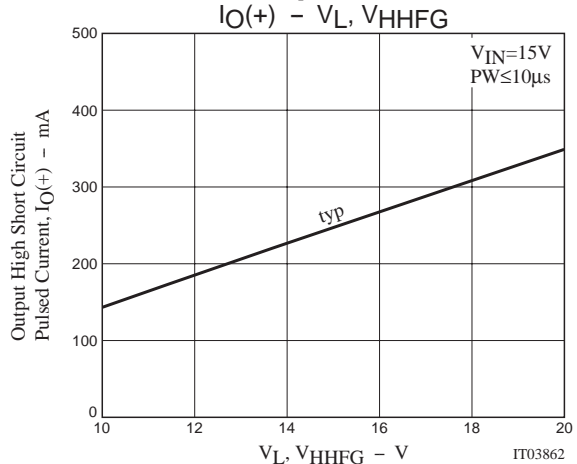
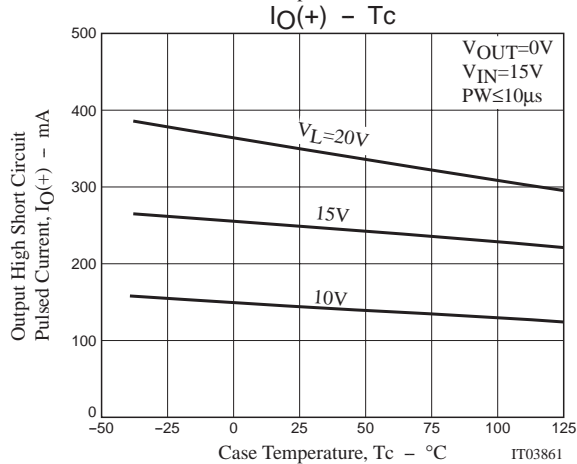
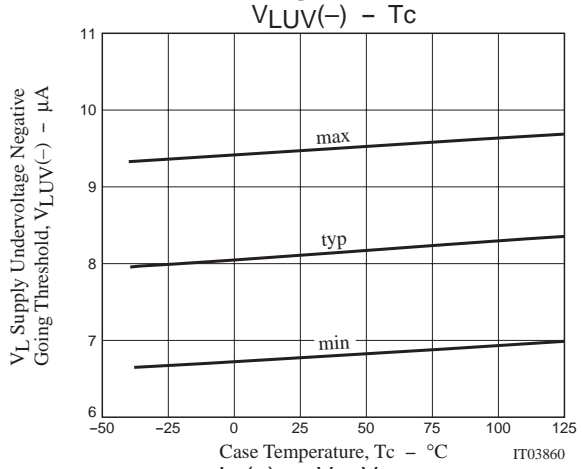
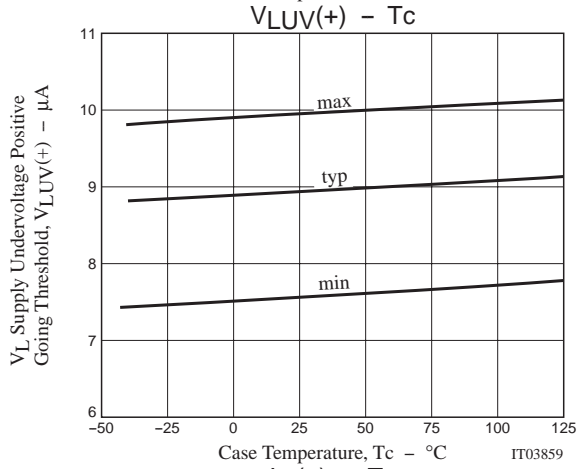
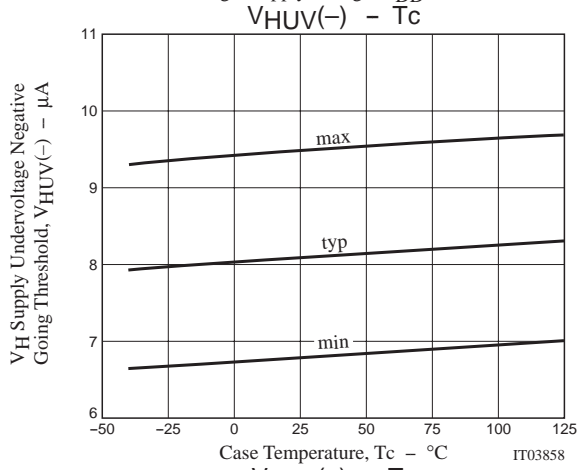
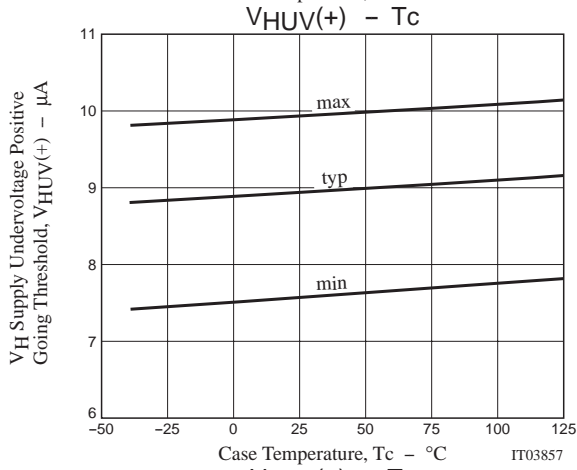
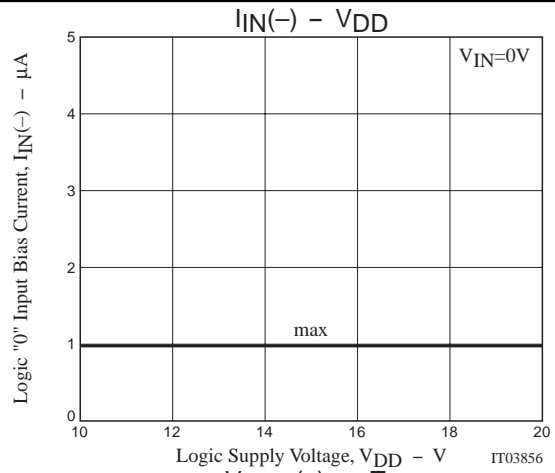
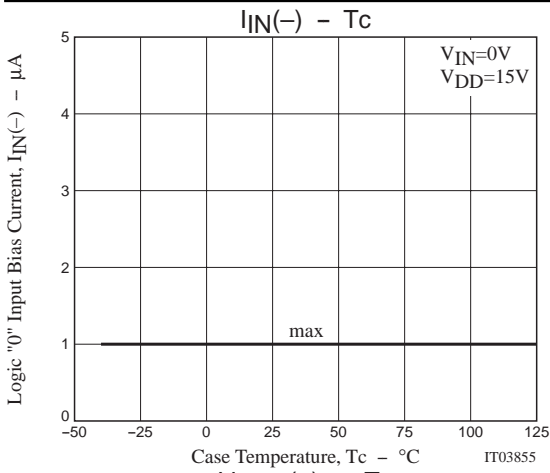
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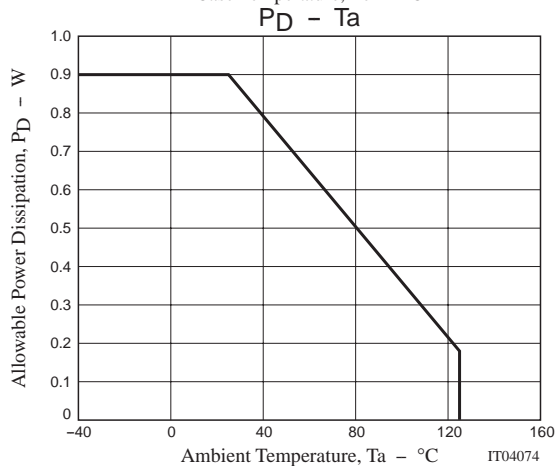
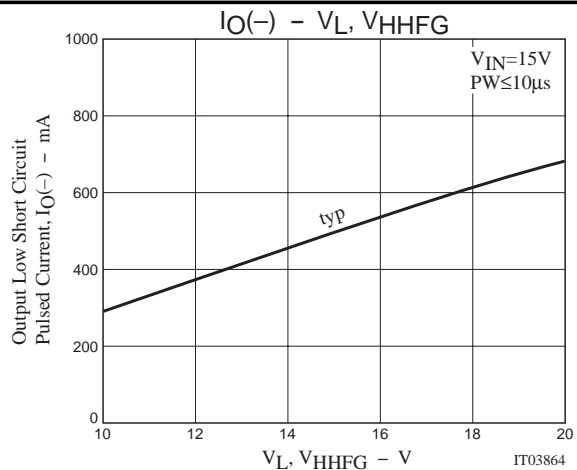
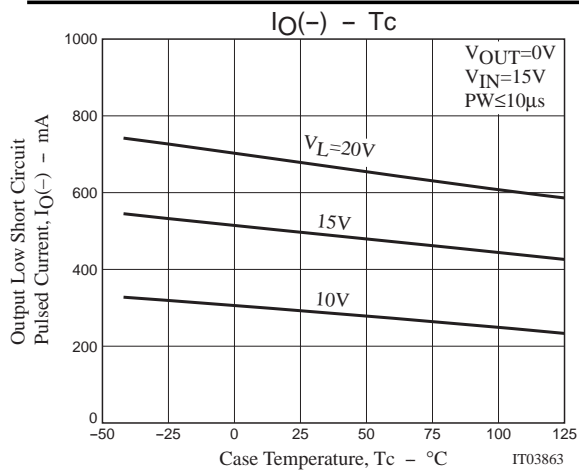
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