Ordering number : ENN7263

ExPD(Excellent Power Device)

TND506MD

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

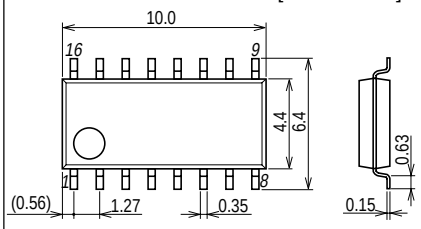
- Monolithic structure.
- Allows simplified configuration of driver circuit.
- Withstand voltage of 600V is assured.
- Shutdown protection function.
- Low-side output-watching circuit.
- Fully compatible input to LSTTL/CMOS.
- Fast switching time(120ns at 1000pF load).
- Propagation delay is about 150ns.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

Package Dimensions

unit : mm

2198

[TND506MD]



1 : LOUT	9 : No Contact
2 : GND	10 : No Contact
3 : VL	11 : VDD
4 : No Contact	12 : HIN
5 : No Contact	13 : SD
6 : HFG	14 : LIN
7 : VH	15 : No Contact
8 : HOUT	16 : No Contact

SANYO : MFP16(225mil)

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 VoltageV_{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	Tj		−55 to +150	°C
Storage Temperature	Tstg		−55 to +150	°C

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

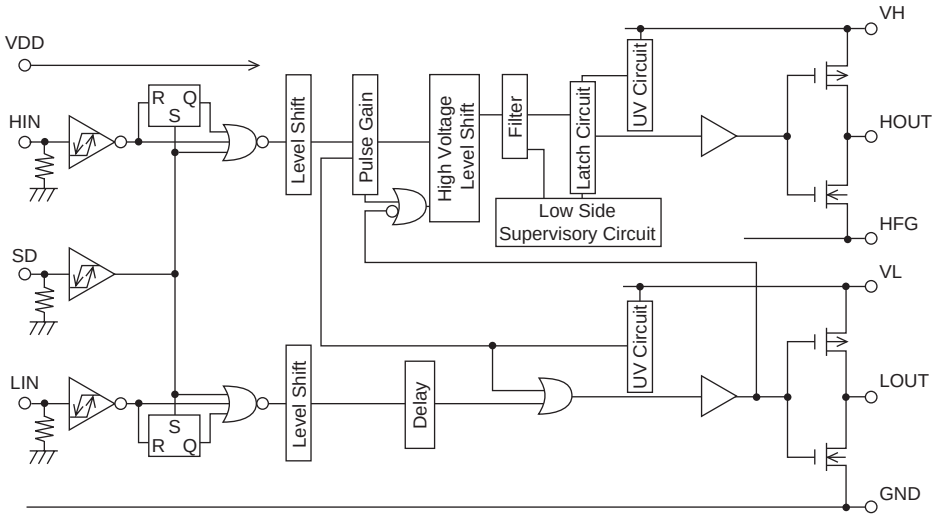
AC Characteristics at Ta=25°C (V_{DD}=V_L=V_{HHFG}=15V, C_L=1000pF)

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	Mt_{on}	$\lvert Ht_{on}-Lt_{on}\rvert$		15		ns
Delay Matching, HS and LS Turn-OFF	Mt_{off}	$\lvert Ht_{off}-Lt_{off}\rvert$		15		ns

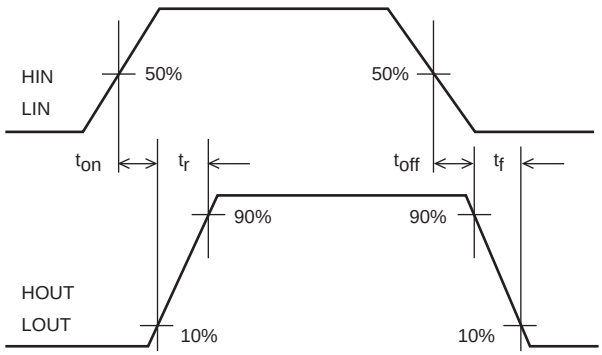
DC Characteristics at Ta=25°C, (V_{DD}=V_L=V_{HHFG}=15V)

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, VBIAS-VO	V_{OH}	V_{IN}=V_{IH}, I_O=0A			0.1	V
Low-level Output Voltage, VO	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

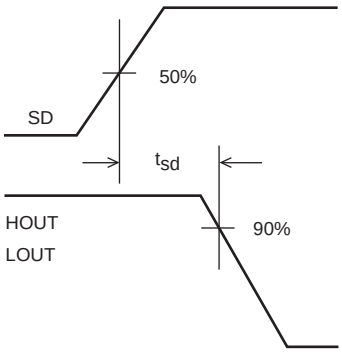
Functional Block Diagram



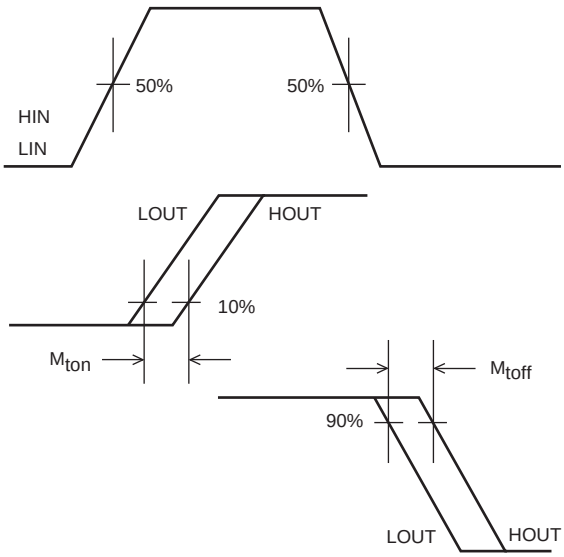
Switching Time Waveform Definition



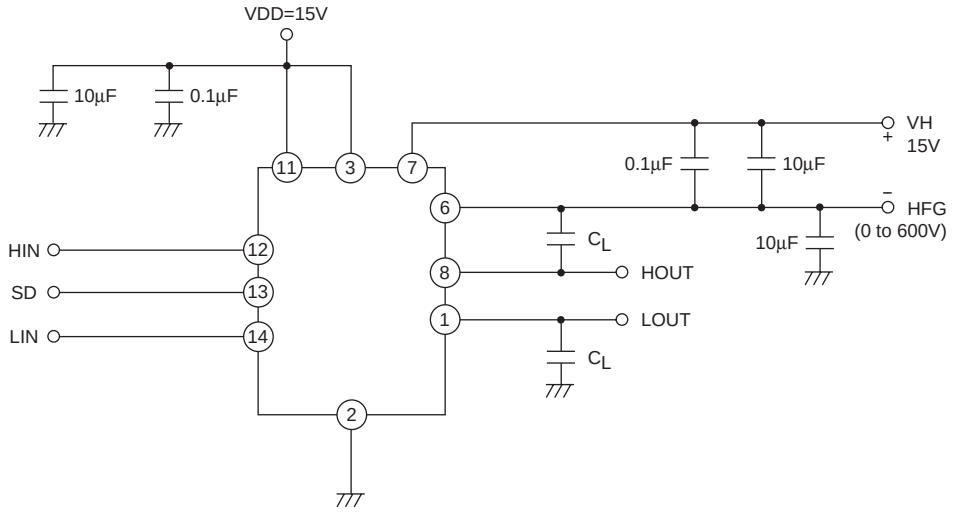
Shutdown Waveform Definition

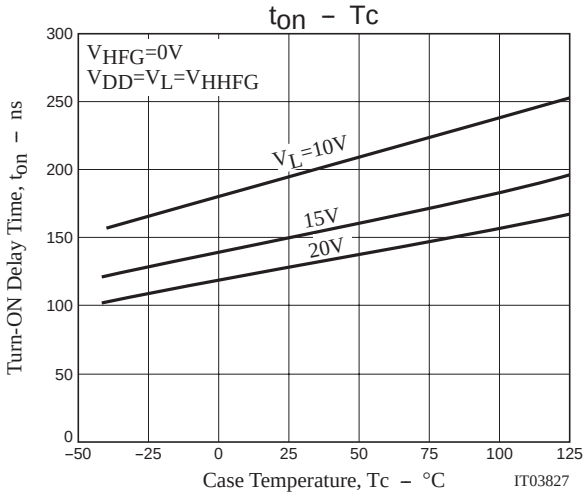


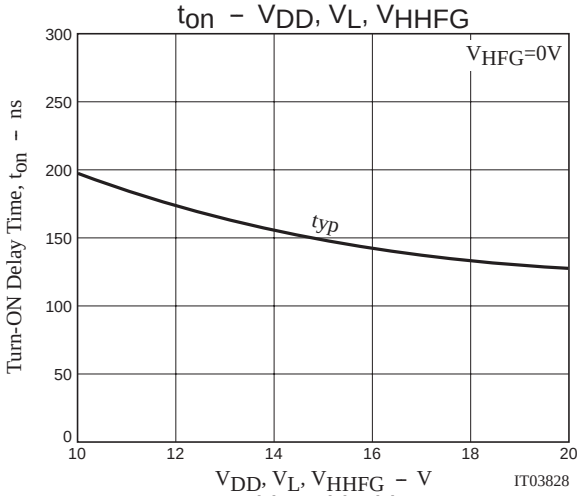
Delay Matching Waveform Definition

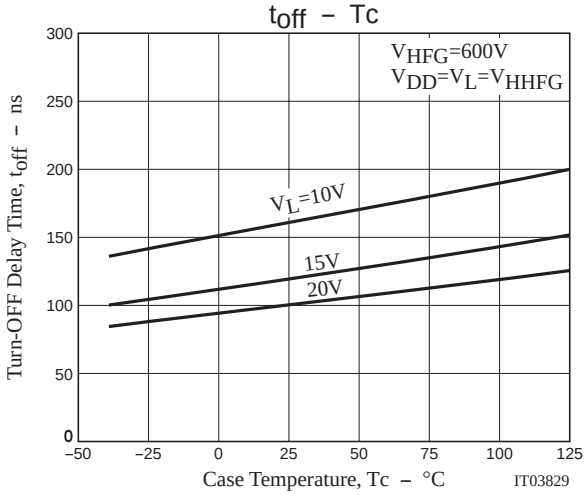


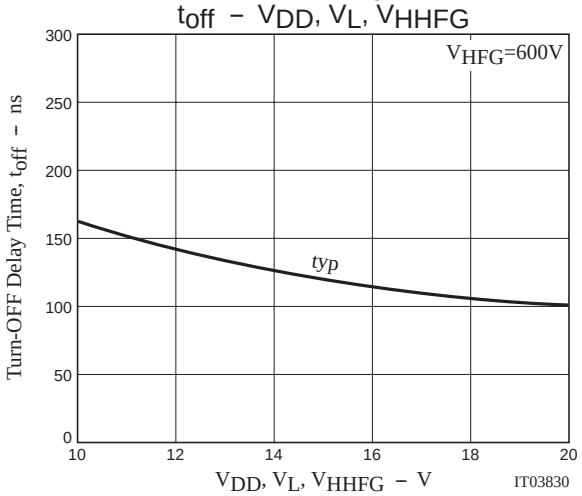
Switching Time Test Circuit



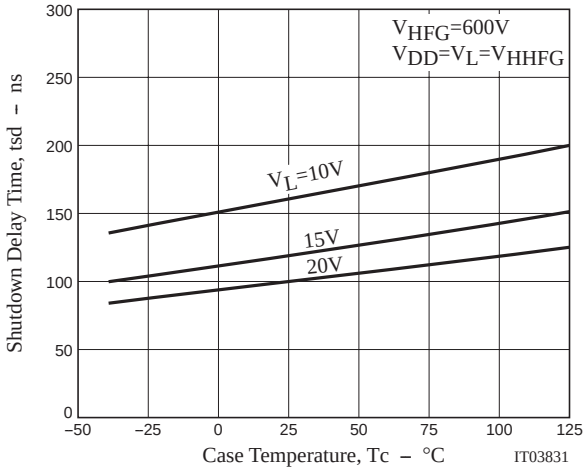




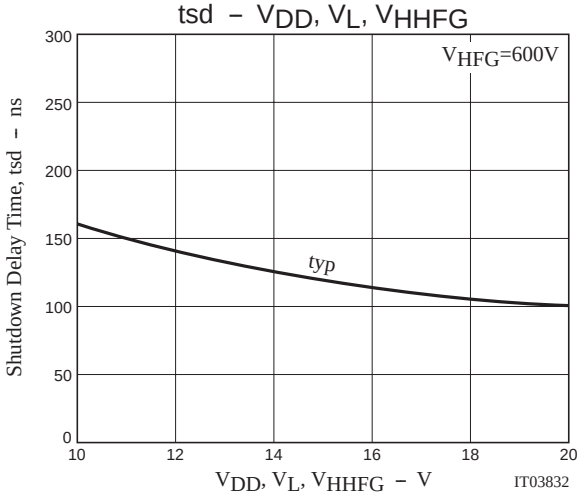




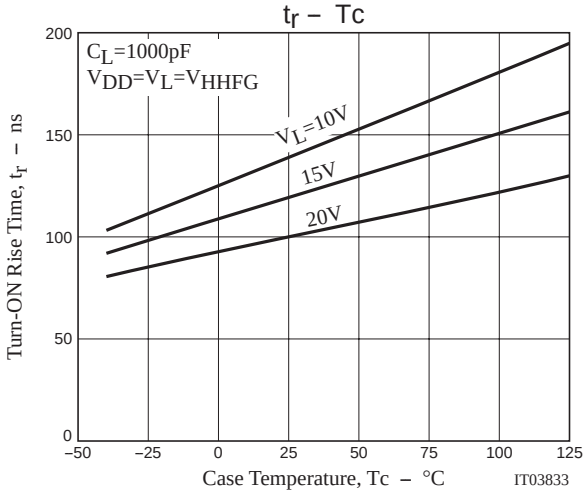
tsd – Tc



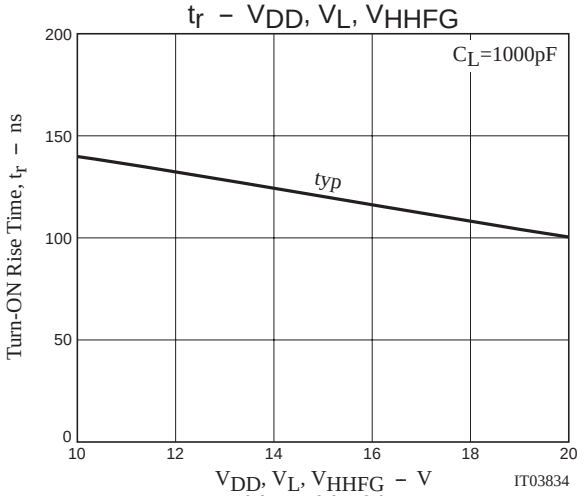
tsd – VDD, VL, VHHFG



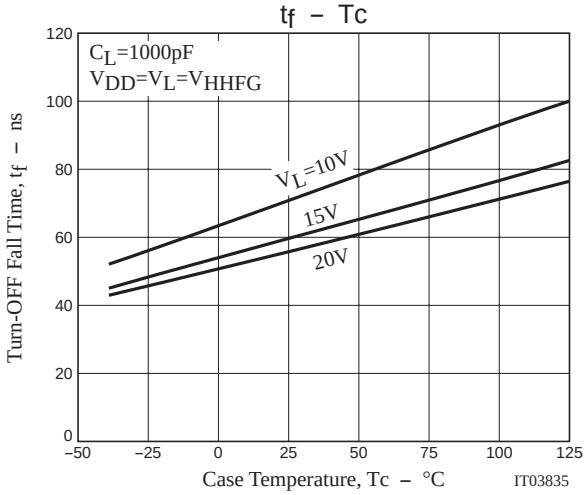
tr – Tc



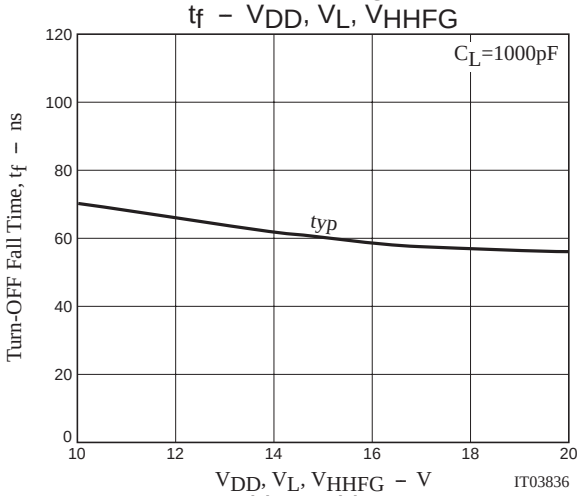
tr – VDD, VL, VHHFG



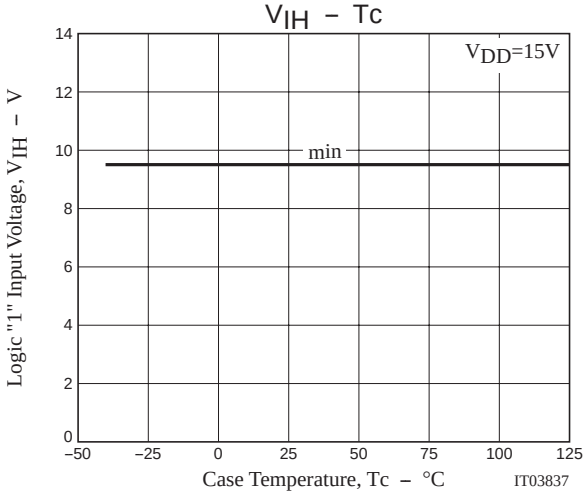
tf – Tc



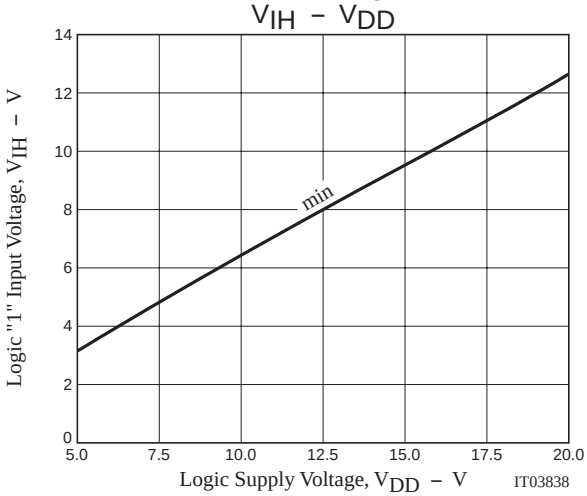
tf – VDD, VL, VHHFG



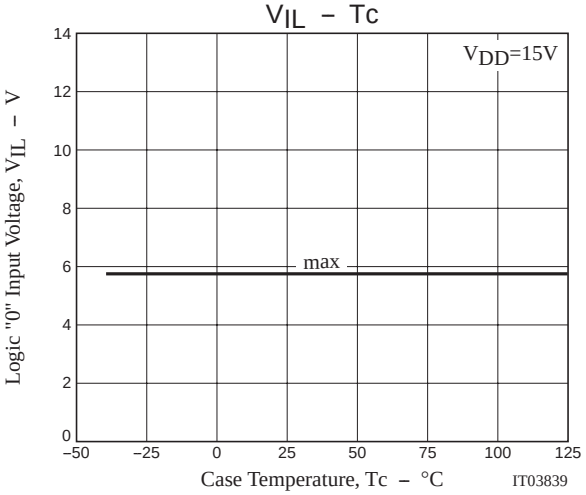
VIH – Tc



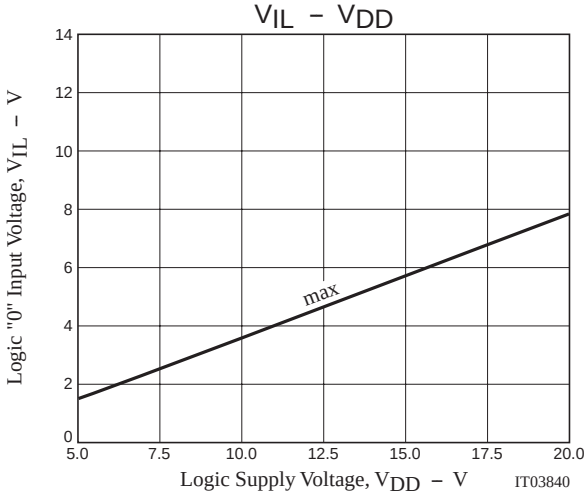
VIH – VDD



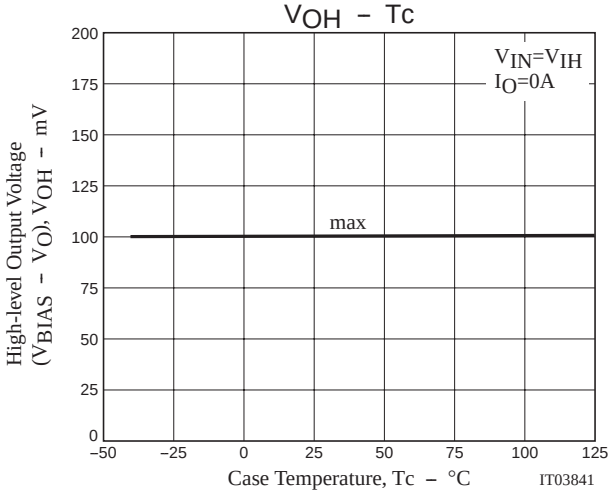
V_{IL} – Tc



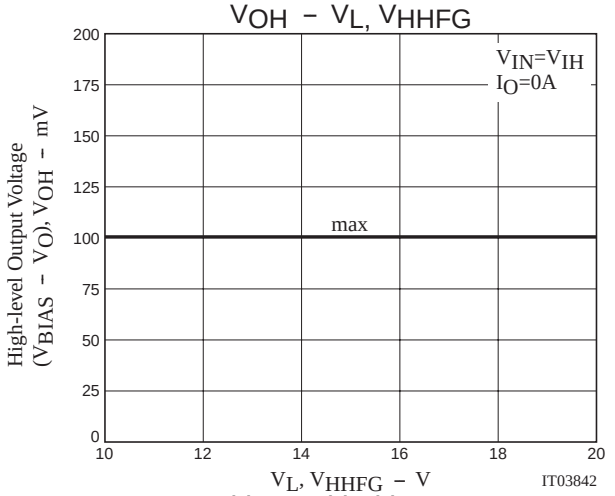
V_{IL} – V_{DD}



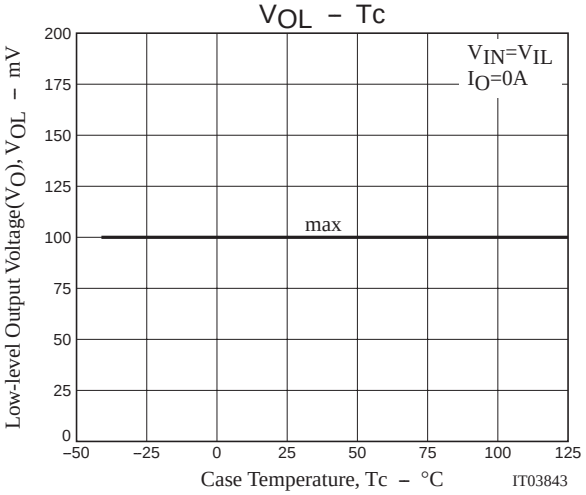
V_{OH} – Tc



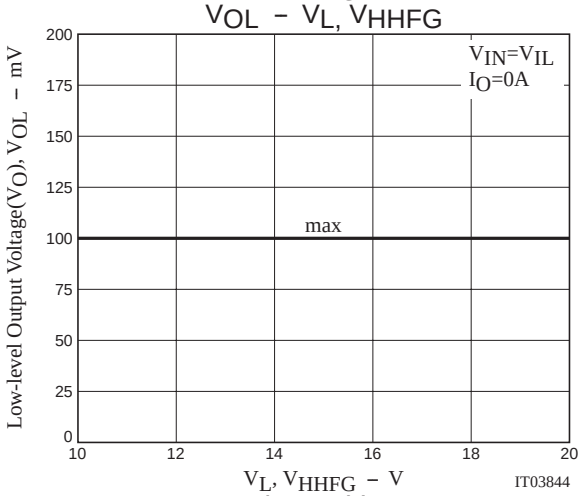
V_{OH} – V_L, V_{HHFG}



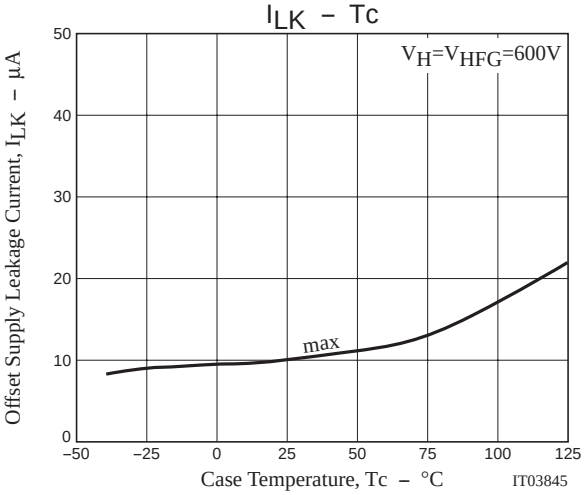
V_{OL} – Tc



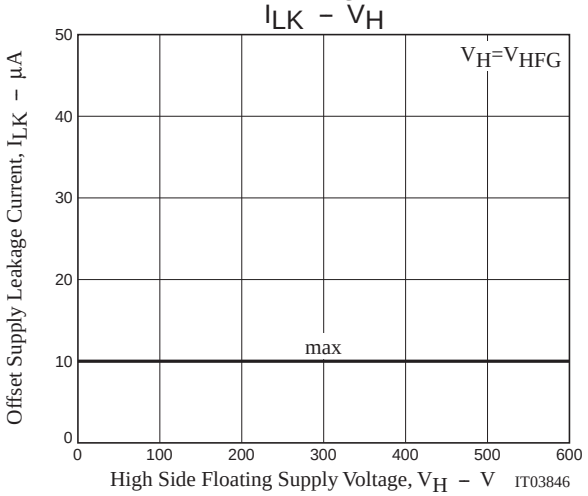
V_{OL} – V_L, V_{HHFG}



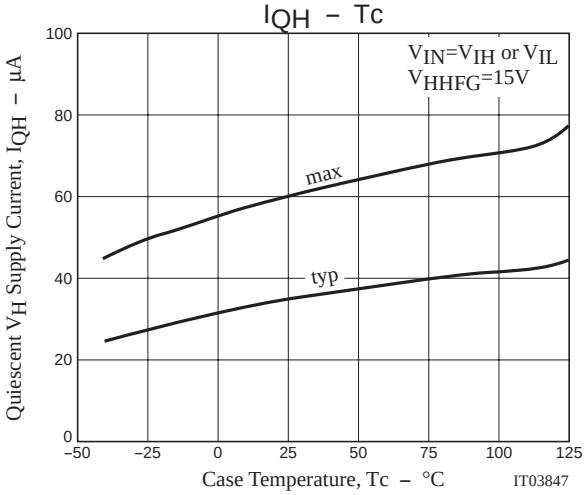
I_{LK} – Tc



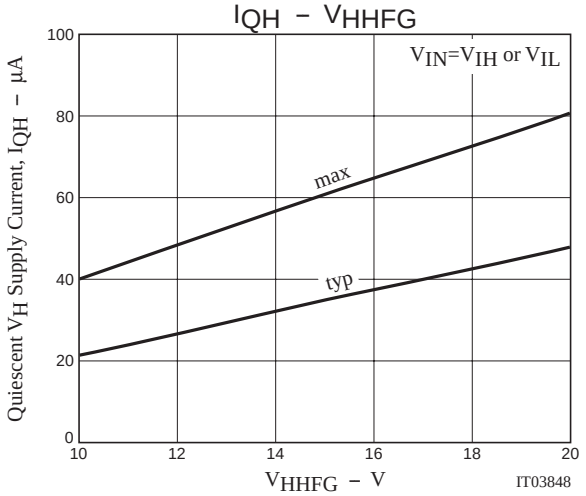
I_{LK} – V_H



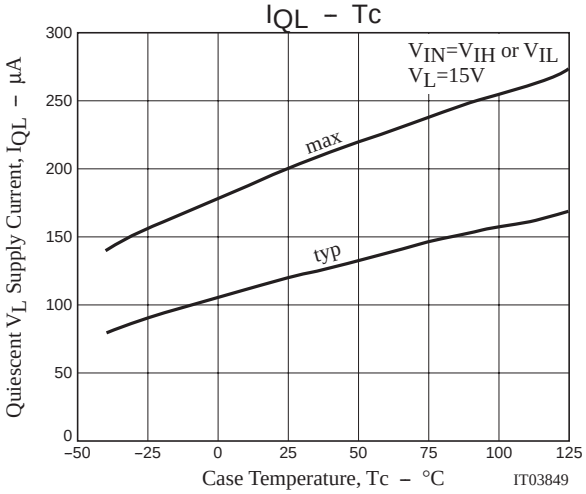
I_{QH} – Tc



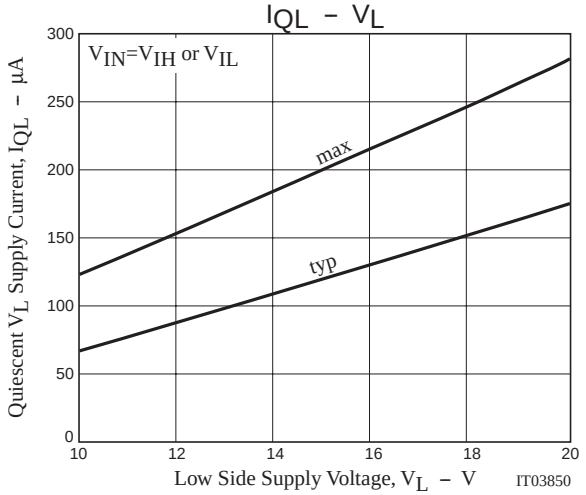
I_{QH} – V_{HHFG}



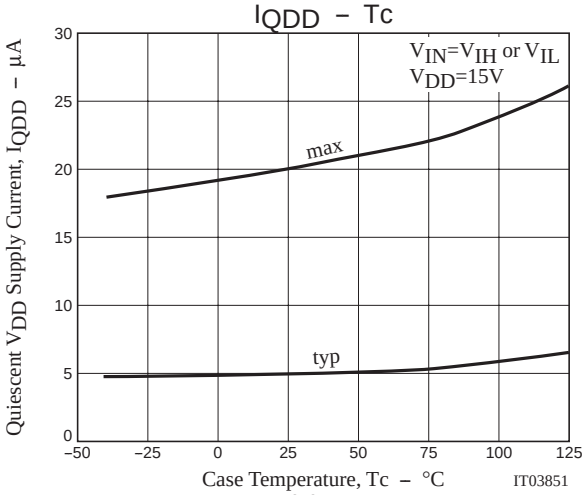
I_{QL} – Tc



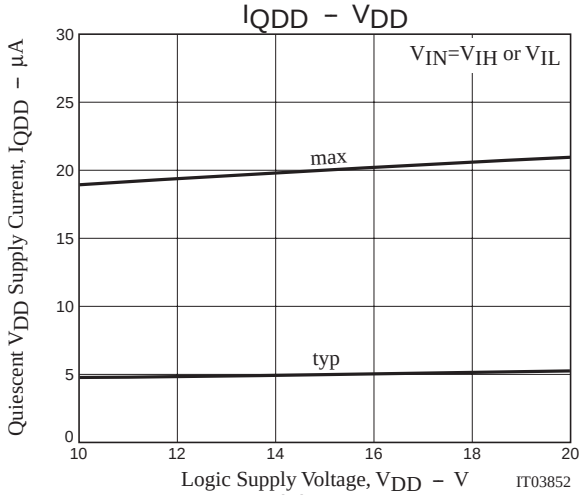
I_{QL} – V_L



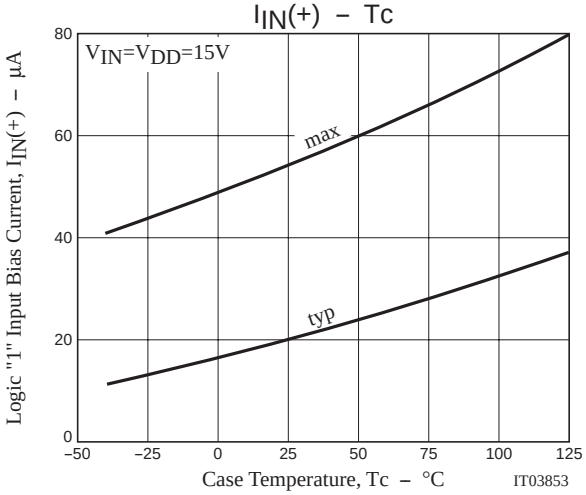
I_{QDD} – Tc



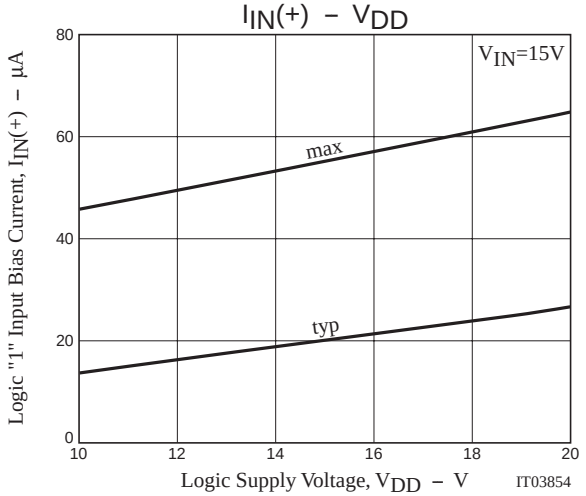
I_{QDD} – V_{DD}

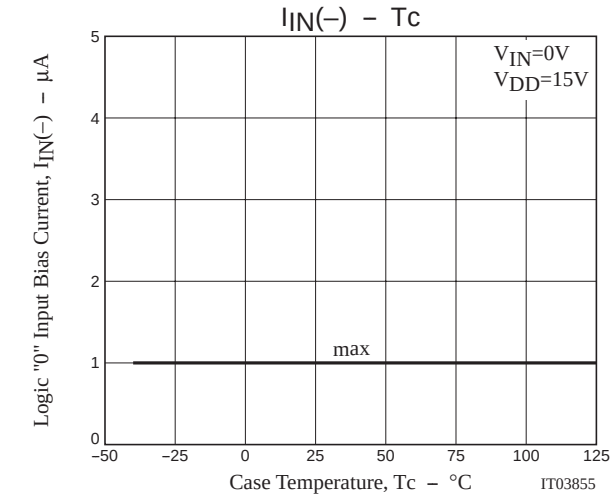


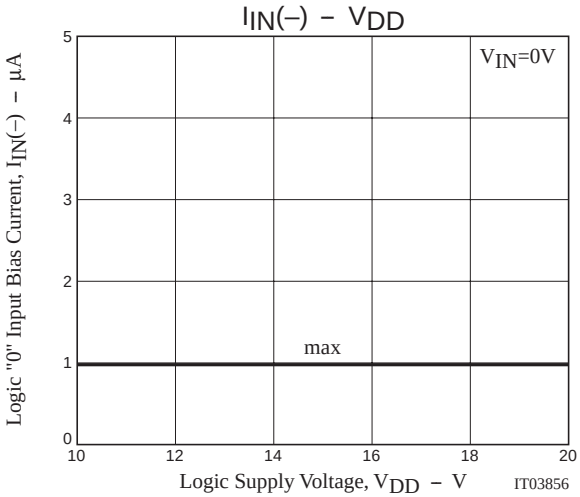
$I_{IN}(+)$ – Tc

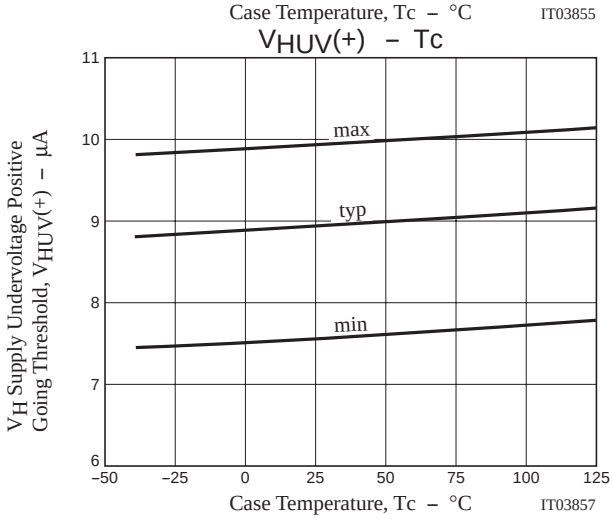


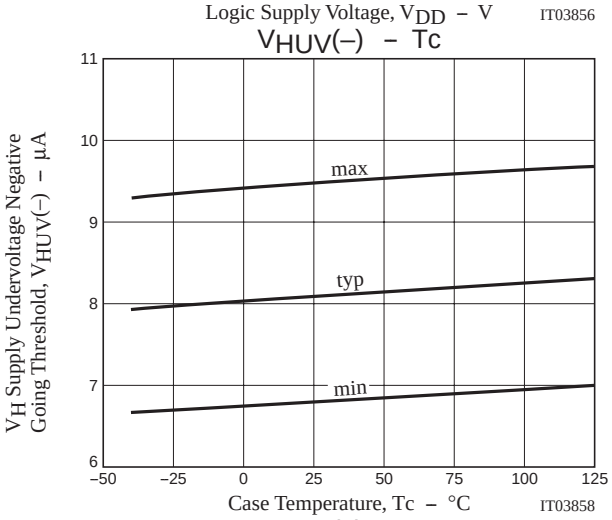
$I_{IN}(+)$ – V_{DD}

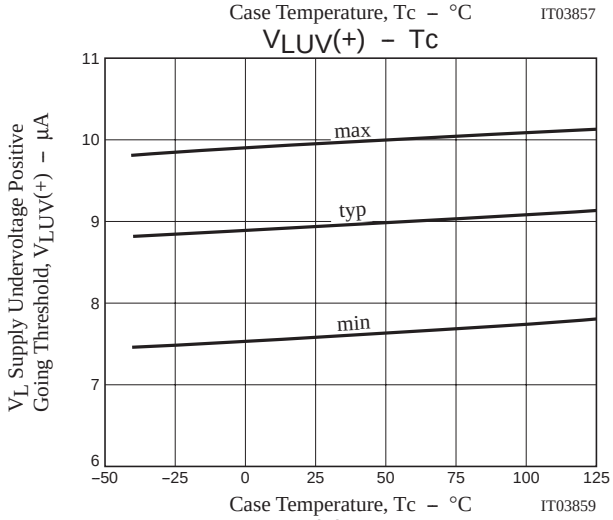


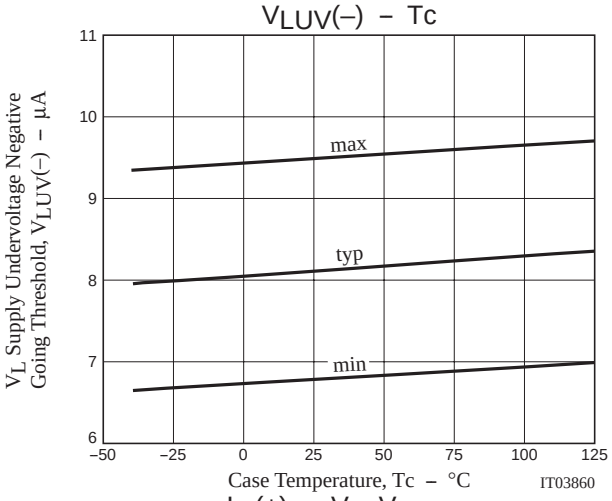

$I_{IN(-)}$ – Tc
V_{IN}=0V
V_{DD}=15V
max
Logic "0" Input Bias Current, $I_{IN(-)}$ – µA
Case Temperature, Tc – °C
IT03855

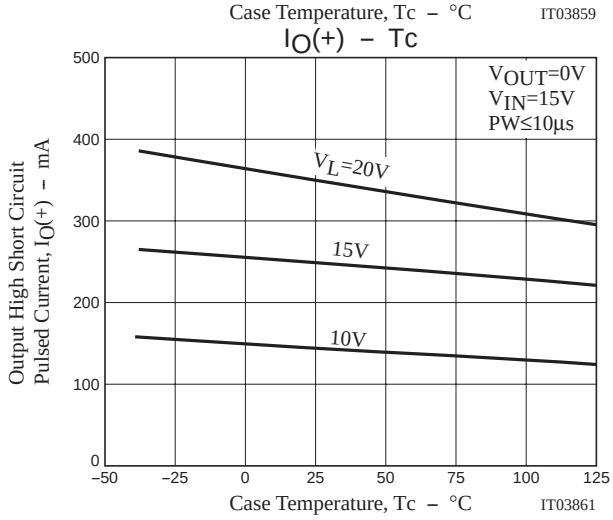

$I_{IN(-)}$ – V_{DD}
V_{IN}=0V
max
Logic "0" Input Bias Current, $I_{IN(-)}$ – µA
Logic Supply Voltage, V_{DD} – V
IT03856

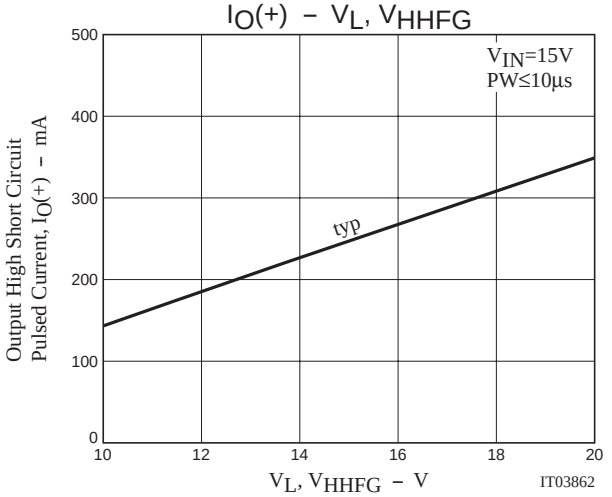

$V_{HUV(+)}$ – Tc
max
typ
min
V_H Supply Undervoltage Positive Going Threshold, $V_{HUV(+)}$ – µA
Case Temperature, Tc – °C
IT03857


$V_{HUV(-)}$ – Tc
max
typ
min
V_H Supply Undervoltage Negative Going Threshold, $V_{HUV(-)}$ – µA
Case Temperature, Tc – °C
IT03858


$V_{LUV(+)}$ – Tc
max
typ
min
V_L Supply Undervoltage Positive Going Threshold, $V_{LUV(+)}$ – µA
Case Temperature, Tc – °C
IT03859


$V_{LUV(-)}$ – Tc
max
typ
min
V_L Supply Undervoltage Negative Going Threshold, $V_{LUV(-)}$ – µA
Case Temperature, Tc – °C
IT03860


$I_{O(+)}$ – Tc
V_{OUT}=0V
V_{IN}=15V
PW≤10µs
V_L=20V
15V
10V
Output High Short Circuit Pulsed Current, $I_{O(+)}$ – mA
Case Temperature, Tc – °C
IT03861


$I_{O(+)}$ – V_L, V_{HHFG}
V_{IN}=15V
PW≤10µs
typ
Output High Short Circuit Pulsed Current, $I_{O(+)}$ – mA
V_L, V_{HHFG} – V
IT03862