

PWM DC/DC Converter IC

■GENERAL DESCRIPTION

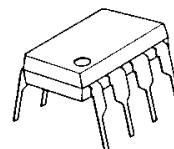
The NJM2392 is a PWM DC/DC converter IC.

It features fixed frequency type PWM control for better noise handling and to avoid intermittent oscillation observed in a simplified controller.

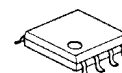
It is suitable for Step-Up, Step-Down and Inverting applications.

In addition, it contains a pulse-by-pulse current limit circuit and can be set by an external resistance.

■PACKAGE OUTLINE



NJM2392D



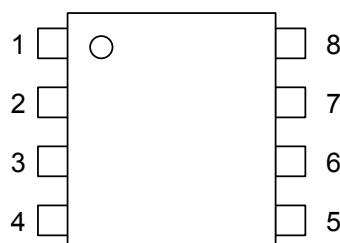
NJM2392M

■FEATURES

- Operating Voltage 3.0V to 40V
- Wide Oscillator Frequency 1kHz to 150kHz
- Internal High Power Transistor 1.5A max.
- Internal Over Current Limit Circuit
- PWM switching control
- Bipolar Technology
- Package Outline

NJM2392D	: DIP8
NJM2392M	: DMP8

■PIN CONFIGURATION

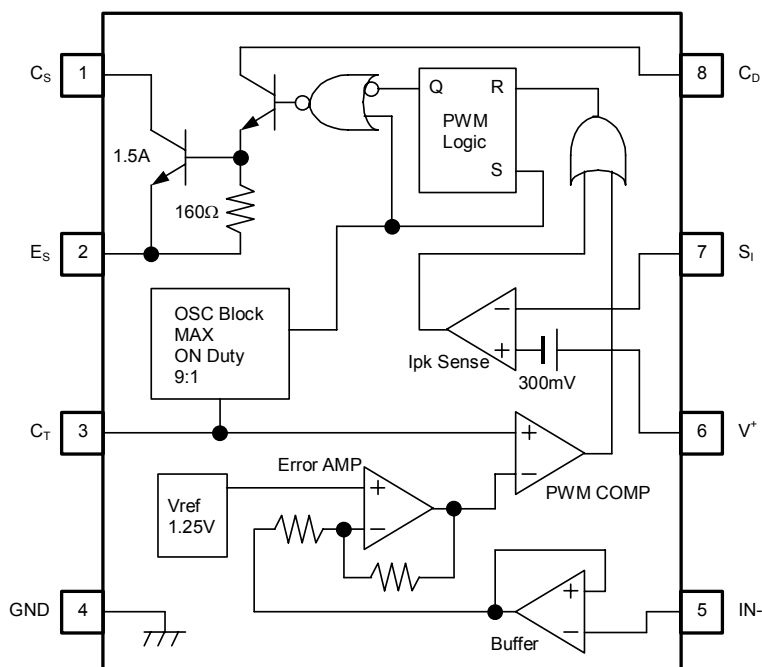


NJM2392D
NJM2392M

PIN FUNCTION

1. C_S
2. E_S
3. C_T
4. GND
5. IN-
6. V^+
7. S_I
8. C_D

■BLOCK DIAGRAM



■ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

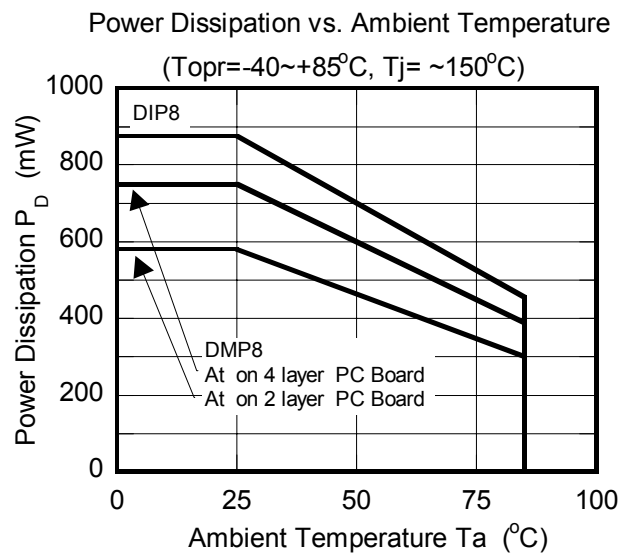
PARAMETER	SYMBOL	MAXIMUM RATINGS	UNIT
Maximum Supply Voltage	V^+	40	V
Comparator Input Voltage	V_{IR}	-0.3 ~ 40 (note)	V
Output Driver Voltage	$V_C(\text{driver})$	40	V
Output Switch Voltage	V_{SW}	40	V
Output Driver Current	$I_C(\text{driver})$	100	mA
Output Switch Current	I_{SW}	1.5	A
Power Dissipation	P_D	DIP8 875 DMP8 580 (*1) 750 (*2)	mW
Operating Temperature Range	Topr	-40 ~ +85	°C
Storage Temperature Range	Tstg	-50 ~ +150	°C

(note) When supply voltage is less than 40V, the absolute maximum input voltage is equal to the supply voltage.

(*1) At on PC board : 114.3mm × 76.2mm × 1.6mm(2 layer FR-4) : Conform to EIA/JEDEC

(*2) At on PC board : 114.3mm × 76.2mm × 1.6mm(4 layer FR-4) : Conform to EIA/JEDEC

■POWER DISSIPATION vs. AMBIENT TEMPERATURE



■ELECTRICAL CHARACTERISTICS

DC Characteristics ($V^+=5V$, $T_a=25^\circ C$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
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OSCILLATOR BLOCK

Oscillation Frequency	f_{OSC}	$IN=0V$, $C_T=1nF$	18	27	36	kHz
Charge Current	I_{chg}		11	18	27	μA
Discharge Current	I_{dis}		110	180	300	μA
Voltage Swing	V_{OSC}	$C_T=1nF$	—	0.5	—	V_{P-P}
Discharge to Charge Current Ratio	I_{ratio}	I_{chg}/I_{dis}	—	9	—	—

CURRENT LIMIT

Peak Current Sense Voltage	V_{ipk}		250	300	350	mV
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OUTPUT SWITCH

Saturation Voltage 1	V_{sat1}	Darlington Connection ($C_S=C_D$), $I_{SW}=0.7A$	—	1.0	1.3	V
Saturation Voltage 2	V_{sat2}	$I_{SW}=0.7A$, $I_C(driver)=50mA$ (Forced $\beta \approx 14$)	—	0.5	0.7	V
Output Transistor Bias Resistance	R_{bias}		—	160	—	Ω
DC Voltage Gain	h_{FE}	$I_{SW}=0.7A$, $V_{CE}=5.0V$	35	120	—	—
Collector Off-State Current	$I_{C(Off)}$	$V_{CE}=40V$	—	0.01	1	μA

ERROR AMPLIFIER

Threshold Voltage	V_{th}		1.225	1.250	1.275	V
Input Bias Current	I_{IB}	$IN=0V$	—	300	900	nA

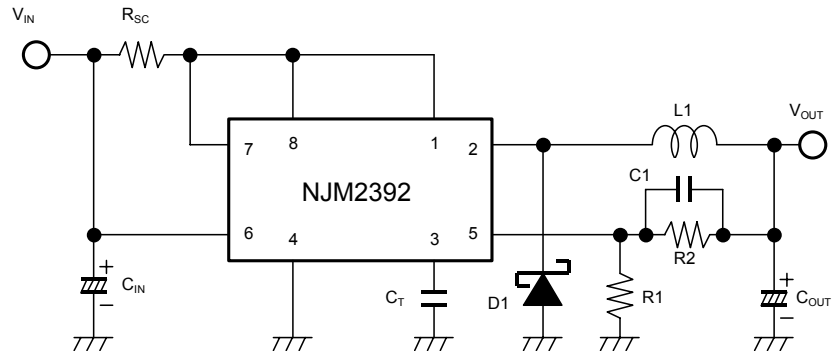
GENERAL CHARACTERISTICS

Operating Current	I_{CC}	$C_T=1nF$, $S_I=V^+$, $IN \rightarrow V_{th}$, $E_S=GND$	—	2.8	4.0	mA
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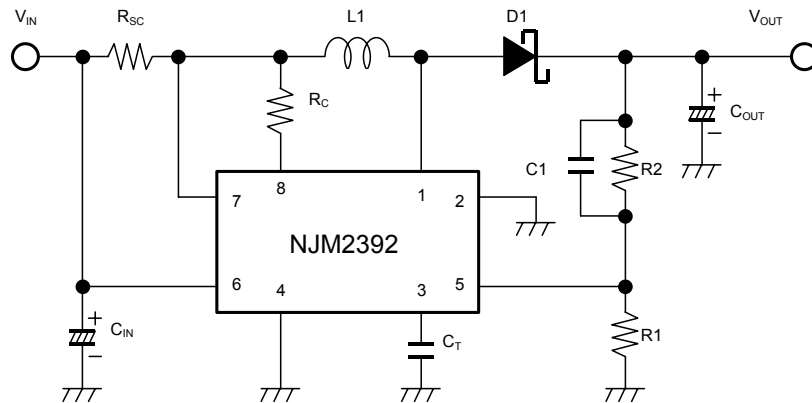
(note) Output switch tests are performed under pulsed conditions to minimize power dissipation.

■TYPICAL APPLICATIONS

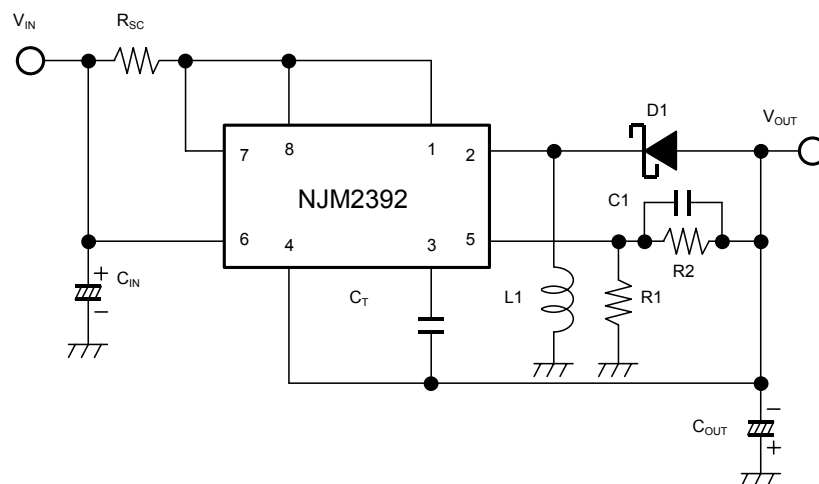
Step-Down Converter



Step-Up Converter



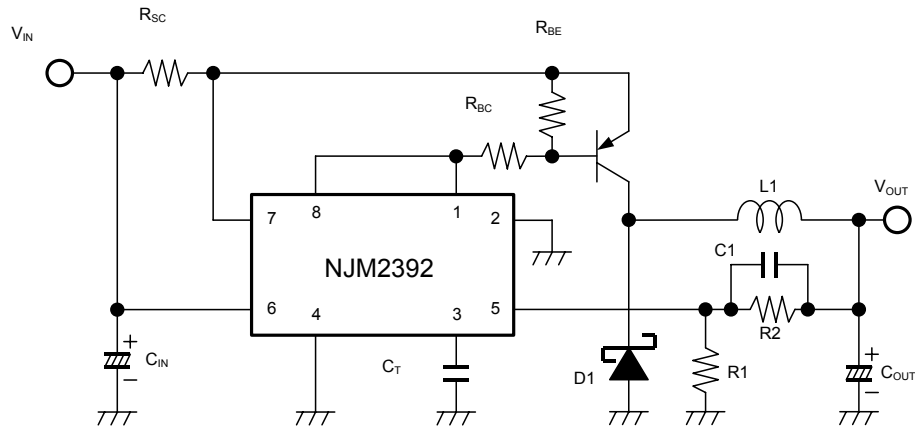
Inverting Converter



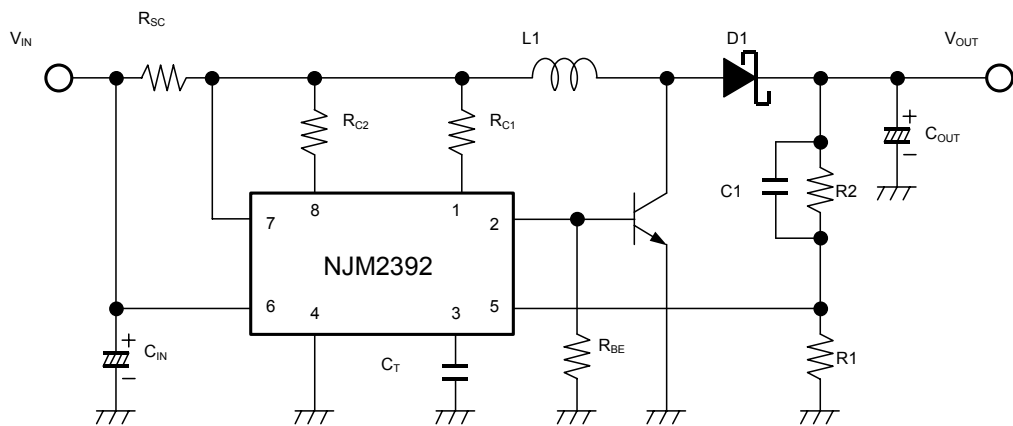
D1 use to schottky diode.

■ TYPICAL APPLICATIONS

Step-Down Converter (High Current)

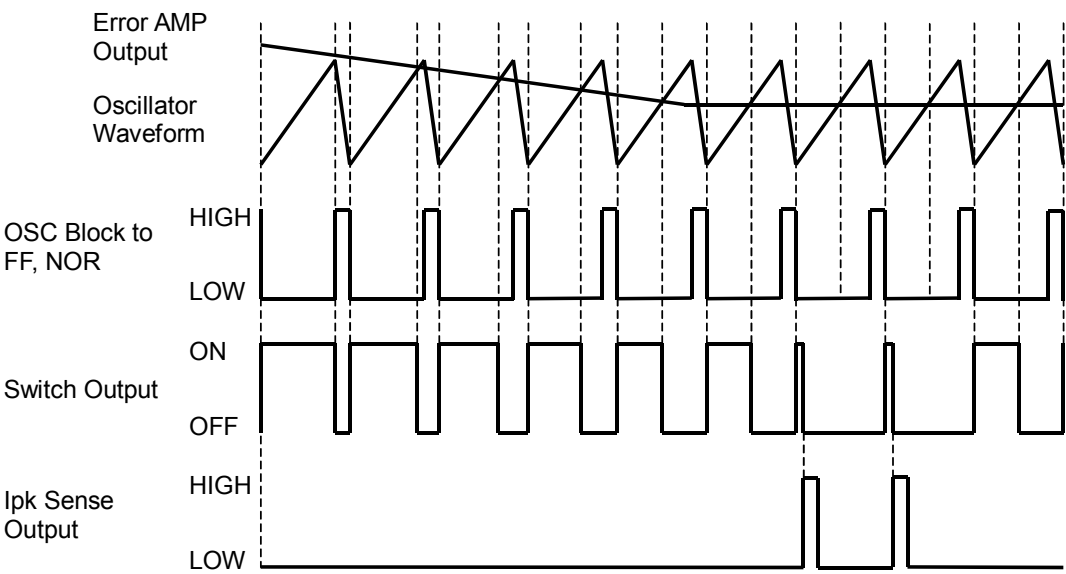


Step-Up Converter (High Current)

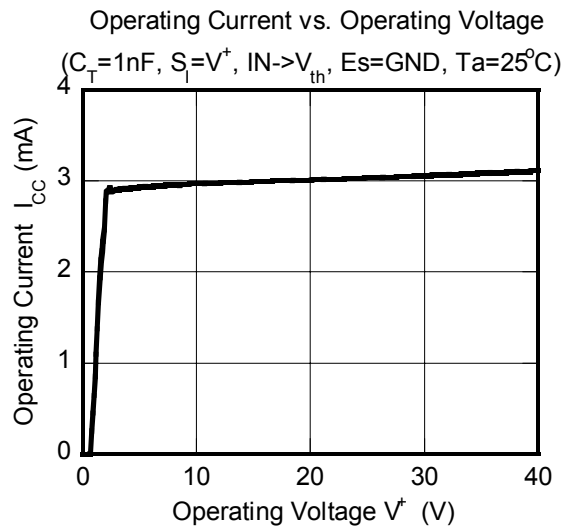
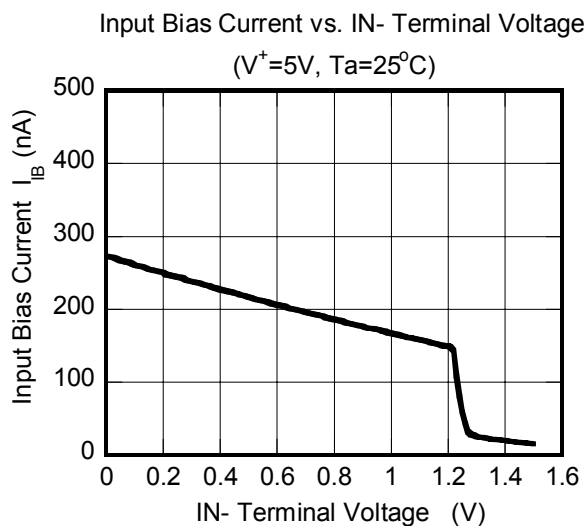
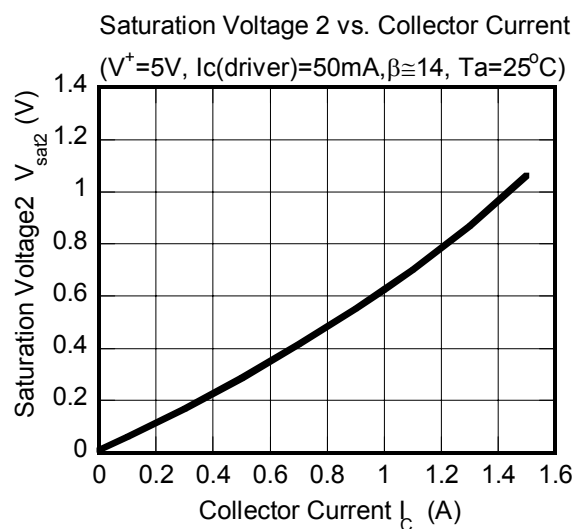
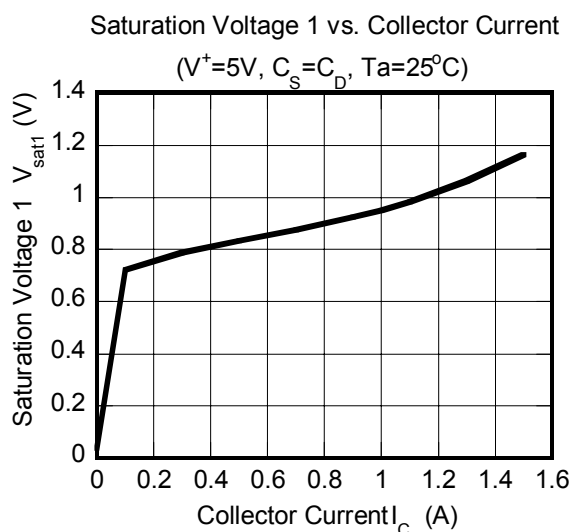
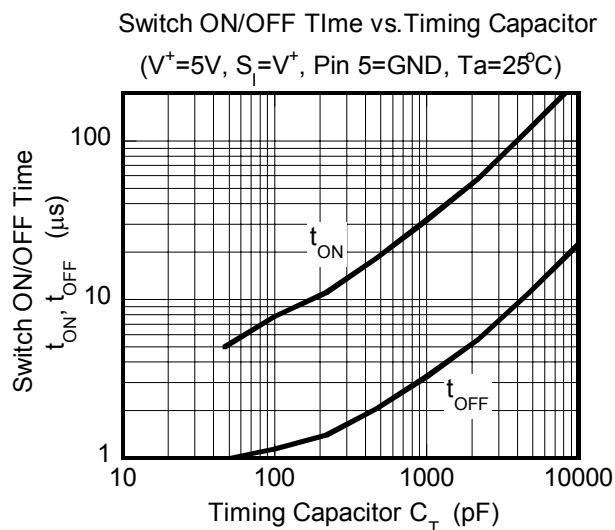
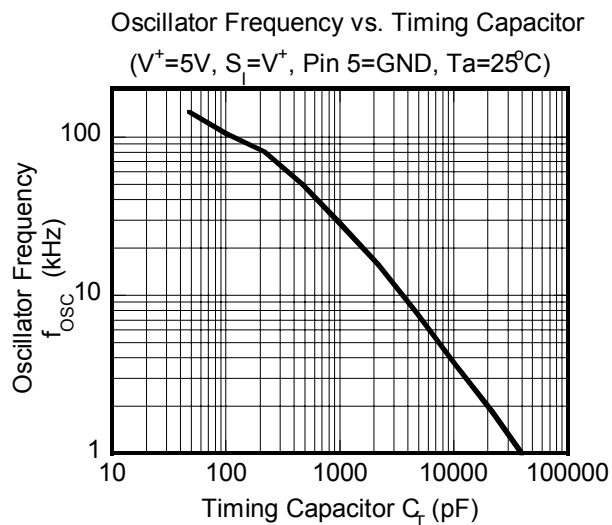


D1 use to schottky diode.

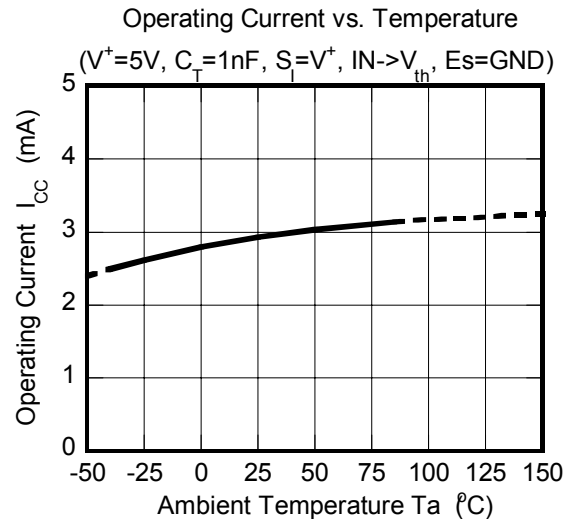
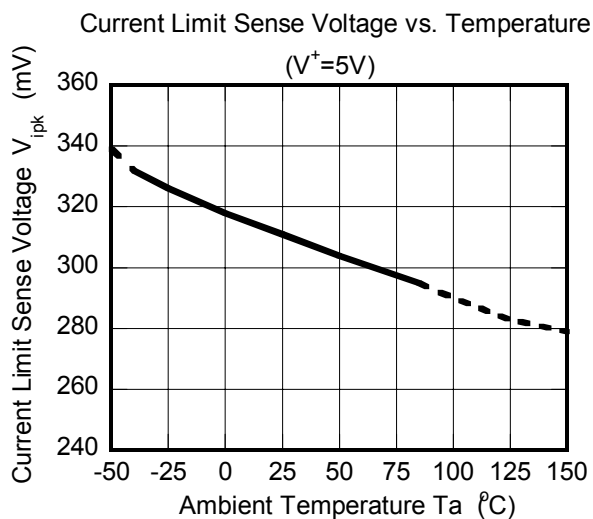
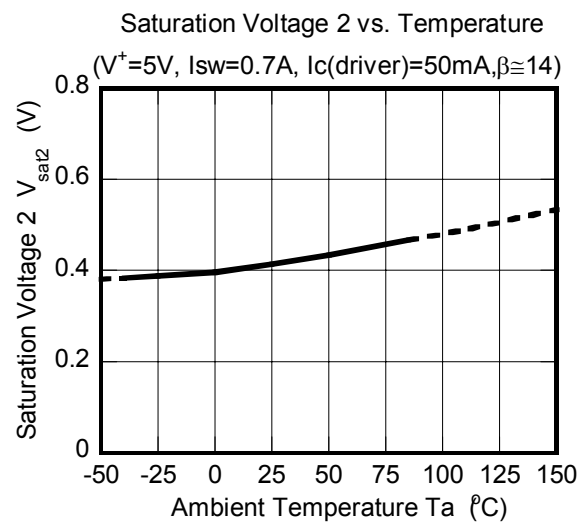
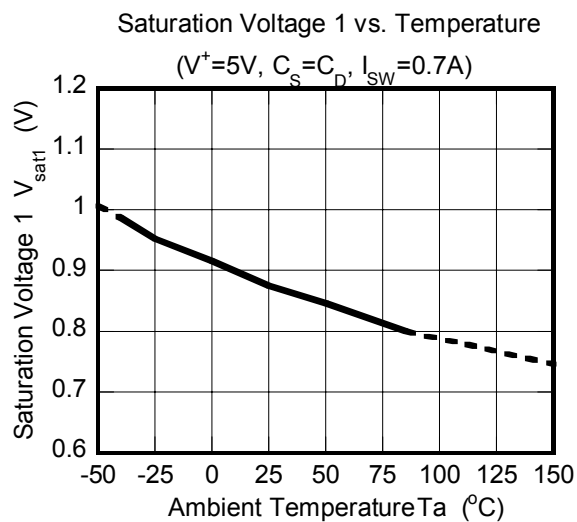
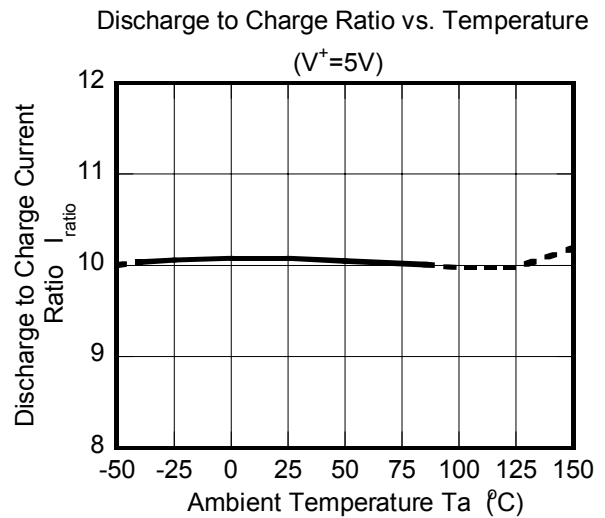
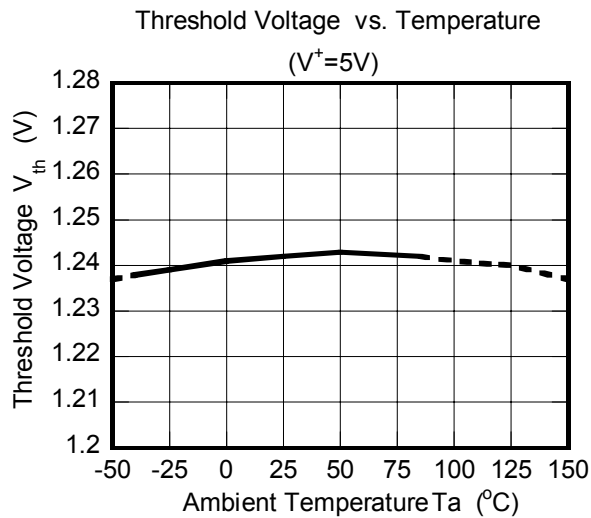
■TIMING CHART



■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



MEMO

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