SWITCHING REGULATOR CONTROL IC

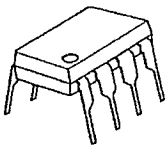
■ GENERAL DESCRIPTION

The **NJM2377** is high speed switching regulator control IC which can operate at low voltage.

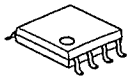
The **NJM2377** consists of low power oscillation circuit, high precision reference, wide band error amplifier, under voltage lockout circuit, and a totempole output circuit; which can drive an external Bipolar transistor directly.

The **NJM2377** is suitable for any potable system, TFT panel to note PC and especially power supply at video CD.

■ PACKAGE OUTLINE



NJM2377D



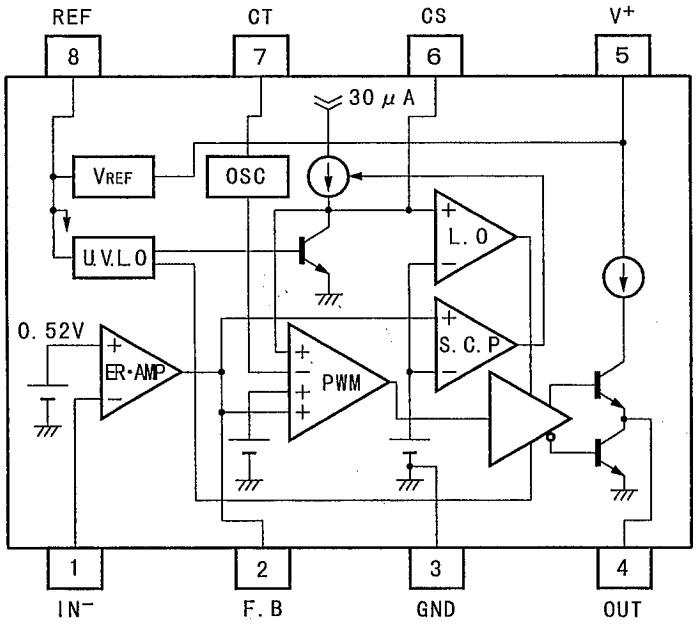
NJM2377M

NJM2377V

■ FEATURES

- PWM Type Switching Regulator Control
- Operating Voltage (2.7～18V)
- Wide Oscillator Range (10～500kHz)
- ON/OFF Maximum Duty Cycle (Ton:Toff=9:1)
- Totem Pole Output
- Soft-Start Function
- Under Voltage Lockouts (U.V.L.O.)
- Bipolar Technology
- Package Outline DIP8, DMP8, SSOP8

■ BLOCK DIAGRAM



PIN FUNCTION

1. IN⁻
2. F. B
3. GND
4. OUT
5. V⁺
6. CS
7. CT
8. REF

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■ ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V^+	18	V
Reference Output Current	I_O	±50	mA
Power Dissipation	P_D	(DIP8) 700 (DMP8) 300 (SSOP8) 250	mW
Operating Temperature Range	T_{OPR}	-40～+85	℃
Storage Temperature Range	T_{STG}	-50～+150	℃

■ RECOMMENDED OPERATING CONDITIONS (V^+=3V, Ta=25℃)

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Operating Voltage	V^+	2.7	18	V
Feed Back Resistor	R_{NF}	100	—	kΩ
Oscillator Timing Capacitor	C_T	220	22,000	pF
Oscillator Timing Resistor	R_T	5	100	kΩ
Oscillation Frequency	f_{OSC}	10	500	kHz

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■ ELECTRICAL CHARACTERISTICS (V^+=3V, R_T=39kΩ, C_T=470pF, Ta=25°C)

REFERENCE VOLTAGE BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{REF}	I_{OR}=1mA	1.47	1.50	1.53	V
Line Regulation	$\Delta Vo-V_{IN}$	V^+=2.7～18V, I_{OR}=1mA	—	3.8	11.5	mV
Load Regulation	$\Delta Vo-Io$	I_{OR}=0.1～5.0mA	—	5	30	mA

OSCILLATOR BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Oscillation Frequency	f_{OSC}	C_T=470pA, R_T=39kΩ	80	100	120	kHz
Oscillate Fluctuations1 (Line Fluctuations)	f_{dv}	V^+=2.7～18V, I_{OR}=1mA	—	1	—	%
Oscillate Fluctuations2 (Temp. Fluctuations)	f_{dt}	Ta=-40～+85°C	—	5	—	%

ERROR AMPLIFIER BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reference Voltage	V_B		0.51	0.52	0.53	V
Input Bias Current	I_B		—	5	100	nA
Open Loop Gain	A_V		—	90	—	dB
Gain Band width Product	G_B		—	1.0	—	MHz
Maximum Output Voltage	V_{OM+}	R_{NF}=100kΩ, IN- Pin=0V	1.9	2.2	2.4	V
(F.B Pin)	V_{OM-}	R_{NF}=100kΩ, IN- Pin=1V	—	—	200	mA
Output Source Current (F.B Pin)	I_{OM+}	V_{OM}=1V, IN- Pin=0V	40	85	200	μA

PWM COMPARABLE BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Bias Voltage (F.B Pin)	V_{THo}	duty·cycle=0%	—	0.45	0.55	V
Input Threshold Voltage (F.B Pin)	V_{THso}	duty·cycle=80%	—	1.05	—	V
Maximum Duty Cycle	αM	F.B Pin=1.2V C_T=470pF, R_T=39kΩ	80	90	—	%

SOFT START CIRCUIT BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Bias Current (CS Pin)	I_{BCS}		—	250	650	nA
Input Threshold Voltage (CS Pin)	V_{THCSo}	duty·cycle=0% F.B Pin=1.2V	—	0.25	0.35	V
Input Threshold Voltage (CS Pin)	V_{THCSso}	duty·cycle=80% F.B Pin=1.2V	—	0.79	—	V

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■ ELECTRICAL CHARACTERISTICS (V^+=3V, R_T=39kΩ, C_T=470pF, Ta=25°C)

SHORT CIRCUIT PROTECTION

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Threshold Voltage (F.B Pin)	V_{THPC}		1.30	1.50	1.80	V
Charge Current (CS Pin)	I_{CHG}	CS Pin=0V, F.B Pin=2V	10	30	50	μA
Latch mode Threshold Voltage (CS Pin)	V_{THLA}		1.20	1.50	1.80	V

UNDER VOLTAGE LOCKOUT

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
ON Threshold Voltage	V_{THON}		—	1.95	—	V
OFF Threshold Voltage	V_{THOFF}		—	1.78	—	V
Hysteresis Voltage	V_{HYS}		60	170	—	mV

OUTPUT BLOCK

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
H-Output Voltage (OUT Pin)	V_{OH}	R_L=10kΩ	1.7	2.0	—	V
L-Output Voltage (OUT Pin)	V_{OL}	Output Sink Current=20mA	—	0.25	0.65	V
Output Source Current (OUT Pin)	I_{SOURCE}	OUT Pin=0V	23	35	—	mA

GENERAL CHARACTERISTIC

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCLA}	Latch Mode, CS Pin=1.8V	—	1.7	2.4	mA
Average Quiescent Current	I_{CCAV}	R_L=∞, duty·cycle=50%	—	5.0	6.8	mA

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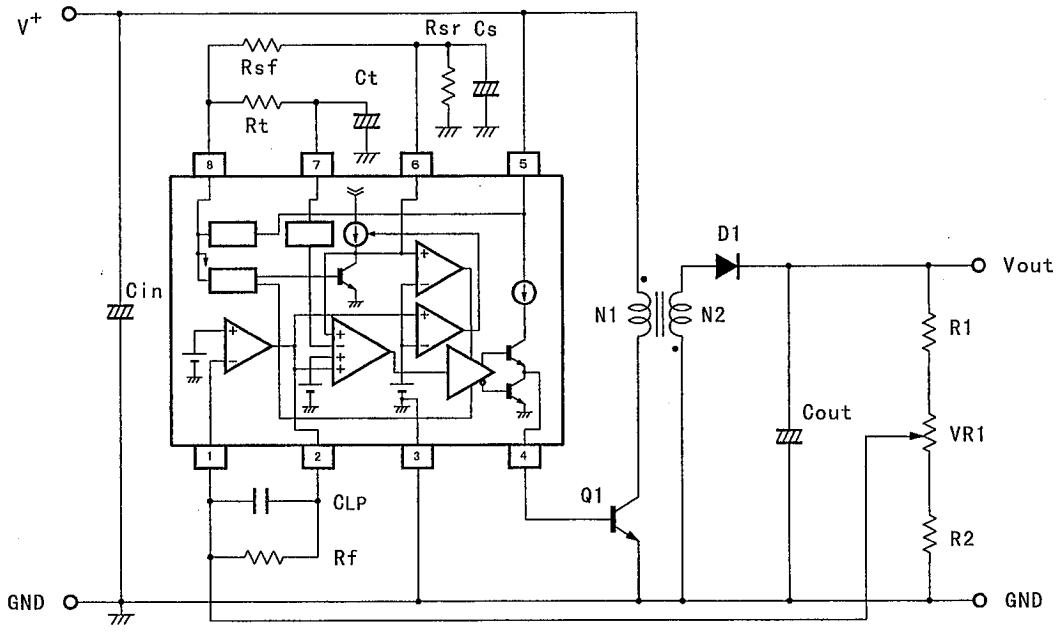
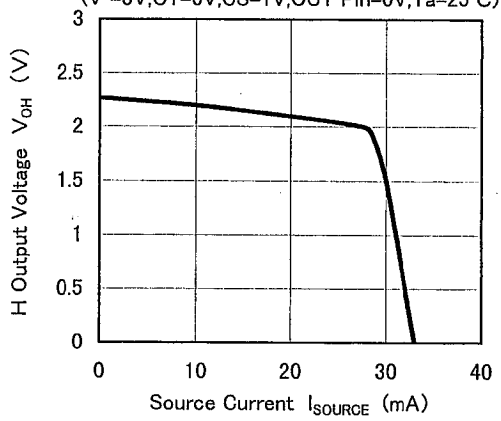
■ TYPICAL APPLICATION

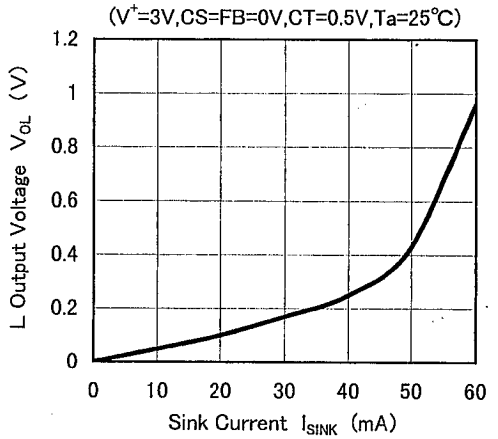


■ TYPICAL CHARACTERISTICS

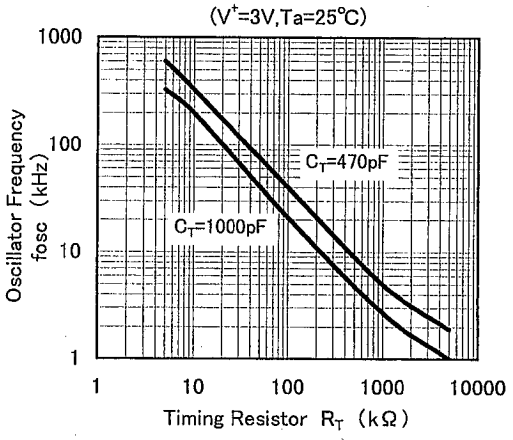
H Output Voltage(OUT Pin) vs. Source Current
(V^+=3V,CT=0V,CS=1V,OUT Pin=0V,Ta=25°C)



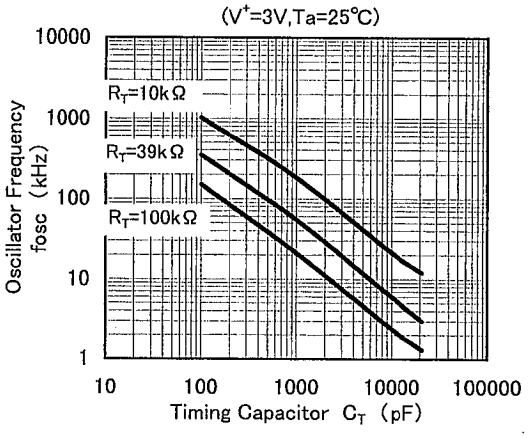
L Output Voltage(OUT Pin) vs. Sink Current
(V^+=3V,CS=FB=0V,CT=0.5V,Ta=25°C)



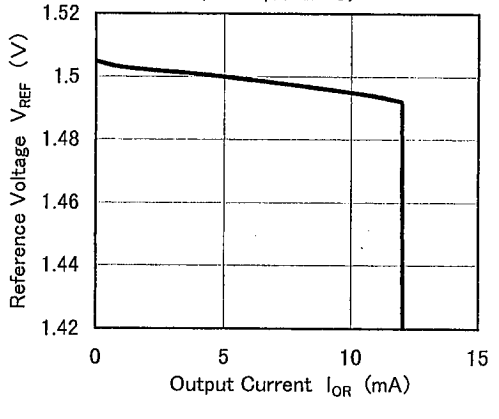
Oscillator Frequency vs. Timing Resistor
(V^+=3V,Ta=25°C)



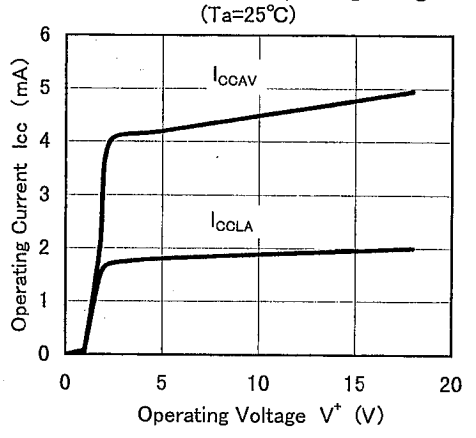
Oscillator Frequency vs. Timing Capacitor
(V^+=3V,Ta=25°C)



Reference Voltage vs. Output Current
(V^+=3V,Ta=25°C)



Operating Current vs. Operating Voltage
(Ta=25°C)



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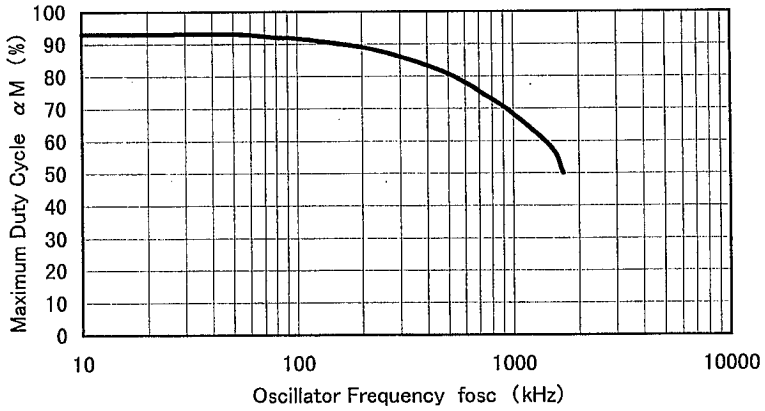
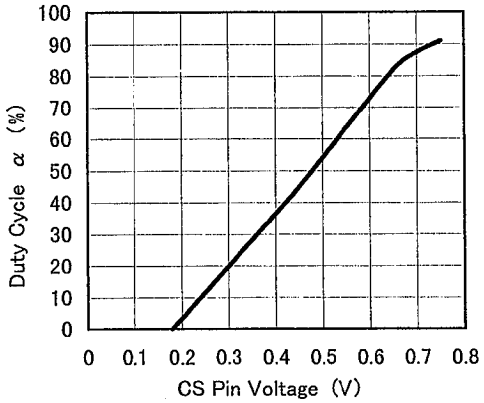
■ TYPICAL CHARACTERISTICS

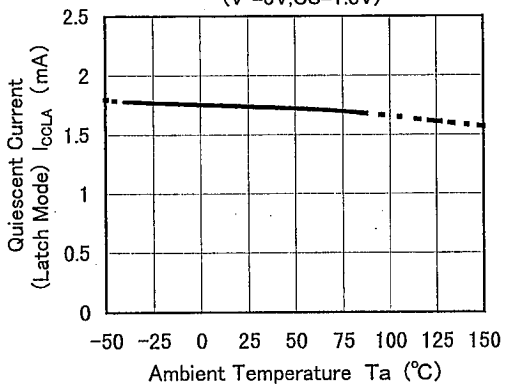
Maximum Duty Cycle vs. Oscillator Frequency
(V^+=3V)



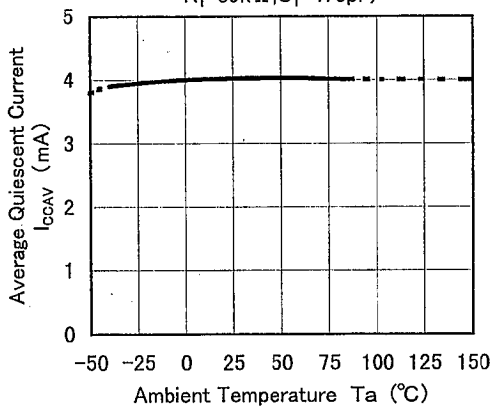
Duty Cycle vs. CS Pin Voltage
(V^+=3V)



Quiescent Current (Latch Mode) vs. Temperature
(V^+=3V,CS=1.8V)

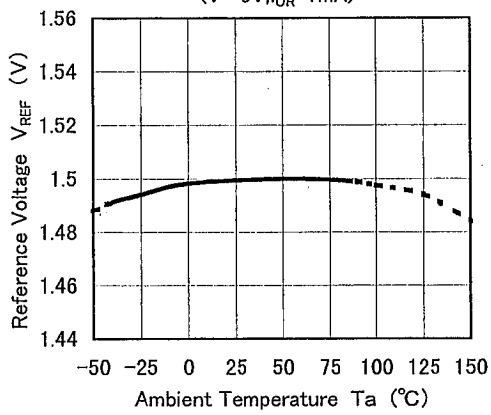


Average Quiescent Current vs. Temperature
(V^+=3V,R_L=∞,duty・cycle=50%
R_T=39kΩ,C_T=470pF)

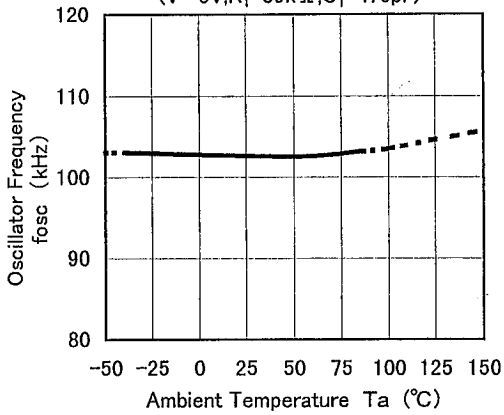


■ TYPICAL CHARACTERISTICS

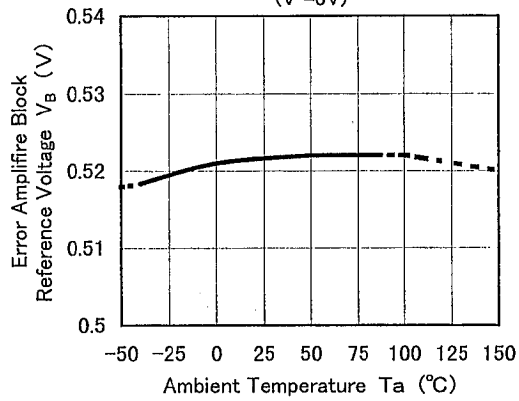
Reference Voltage Block
Reference Voltage vs. Temperature
(V^+=3V,I_{OR}=1mA)



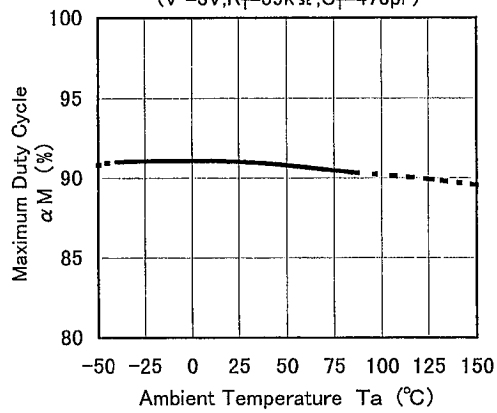
Oscillator Frequency vs. Temperature
(V^+=3V,R_T=39kΩ,C_T=470pF)



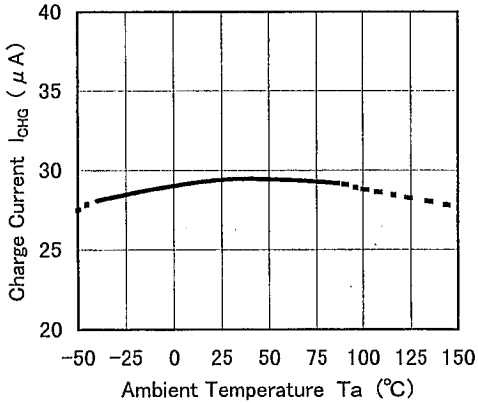
Error Amplifire Block
Reference Voltage vs. Temperature
(V^+=3V)



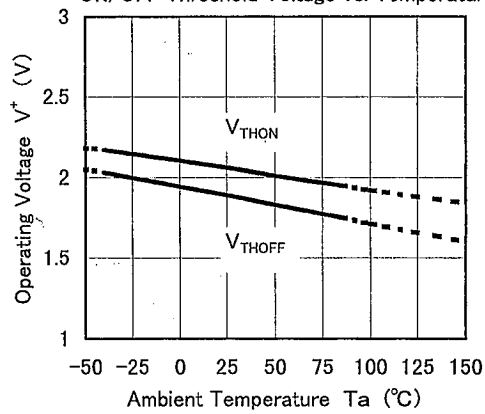
Maximum Duty Cycle vs. Temperature
(V^+=3V,R_T=39kΩ,C_T=470pF)



Charge Current (CS Pin) vs. Temperature
(V^+=3V,F.B Pin=2V)



Under Voltage Lockout Block
ON/OFF Threshold Voltage vs. Temperature



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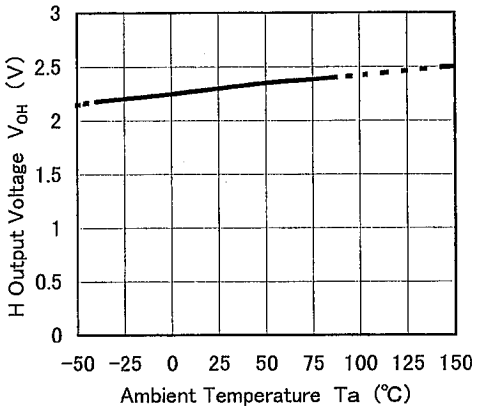
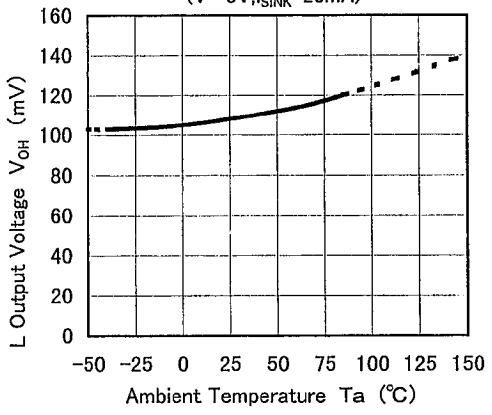
■ TYPICAL CHARACTERISTICS

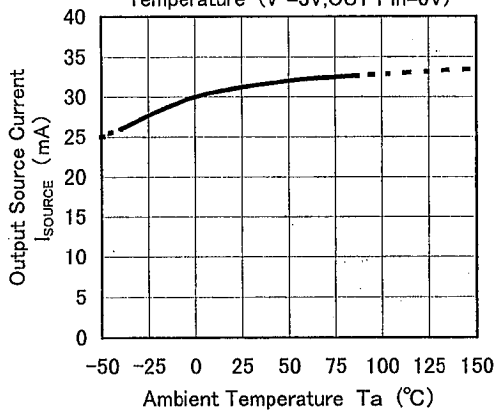
H Output Voltage (OUT Pin) vs. Temperature
(V^+=3V,R_L=10kΩ)



L Output Voltage (OUT Pin) vs. Temperature
(V^+=3V,I_{SINK}=20mA)



Output Source Current (OUT Pin) vs. Temperature (V^+=3V,OUT Pin=0V)



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MEMO

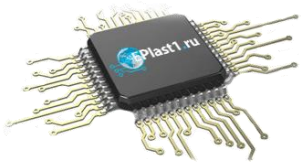
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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