LOW DROPOUT VOLTAGE REGULATOR WITH ON/OFF CONTROL

■ GENERAL DESCRIPTION

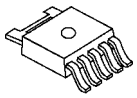
The NJM2386A is a general purpose low dropout voltage regulators with ON/OFF control.

The output current is up to 1.0A and dropout voltage is up 0.2V typical at 500mA load.

It features high maximum input voltage of 30V for a wide application range including TV, home appliance and power modules.

Compared with the NJM2386, Off control quiescent current is significantly reduces for current sensitive applications.

■ PACKAGE OUTLINE

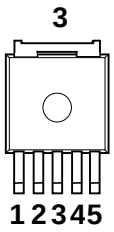


NJM2386ADL3

■ FEATURES

- ●High Maximum Input Voltage Up to 30V
- ● Low Dropout Voltage 0.2V typ. at Io=0.5A
- ● Output Current Io(max.)=1.0A
- ● ON/OFF Control (Active High)
- ● OFF Control Quiescent Current
- ● Internal Short Circuit Current Limit
- ● Internal Overvoltage Protection
- ● Internal Thermal Overload Protection
- ● Bipolar Technology
- ● Package Outline TO-252-5

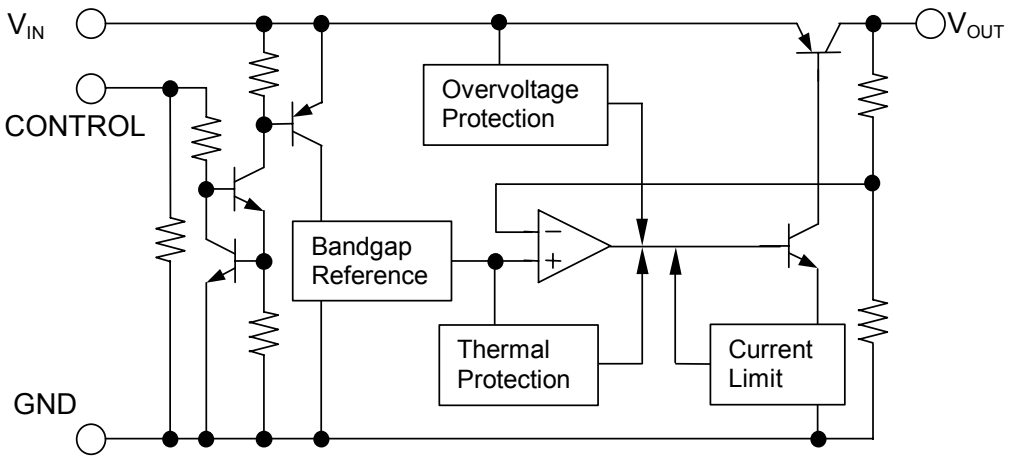
■ PIN CONFIGURATION



NJM2386ADL3

PIN FUNCTION
1. V_{IN}
2. ON/OFF CONTROL
3. V_{OUT}
4. N.C.
5. GND

■ EQUIVALENT CIRCUIT



■ OUTPUT VOLTAGE RANK LIST

Device Name	V_{OUT}
NJM2386ADL3-33	3.3V
NJM2386ADL3-05	5.0V
NJM2386ADL3-08	8.0V
NJM2386ADL3-09	9.0V
NJM2386ADL3-12	12.0V

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	+35	V
Control Voltage	V_{CONT}	+35(*1)	V
Output Current	Io	1.0	A
Power Dissipation	P_D	10(Tc≤25°C) / 1(Ta≤25°C)	W
Operating Junction Temperature Range	Tj	-40 ~ +150	°C
Operating Temperature Range	Topr	-40 ~ +85	°C
Storage Temperature Range	Tstg	-50 ~ +150	°C

(*1): When input voltage is less than +35V, the absolute maximum control voltage is equal to the input voltage.

■ ELECTRICAL CHARACTERISTICS (V_{IN}=V_O+1V, Io=0.5A, C_{IN}=0.33µF, Co=22µF, Tj=25°C)

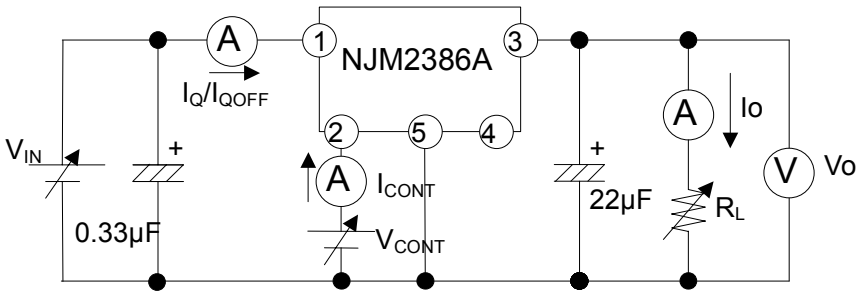
Measurement is conducted by pulse testing.

PARAMETER		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Voltage		V_{IN}		-	-	30	V
Output Voltage		Vo	V_{IN}=V_O+1V	-2%	-	+2%	V
Line Regulation		$\Delta Vo/\Delta V_{IN}$	V_{IN}=V_O+1V ~ V_O+17V	-	0.04	0.16	%/V
Load Regulation		$\Delta Vo/\Delta Io$	V_{IN}=V_O+2V,Io=0A ~1.0A	-	0.2	1.4	%/A
Average Temperature Coefficient of Output Voltage		$\Delta Vo/\Delta T$	Tj=0 ~ +125°C	-	±0.02	-	%/°C
Quiescent Current		I_Q	Io=0A, V_{CONT}=2.7V Except I_{CONT}	-	-	5	mA
OFF Control Quiescent Current		$I_{Q(OFF)}$	V_{CONT}=0V	-	-	1	µA
Dropout Voltage		ΔV_{I-O}	Io=0.5A	-	0.2	0.5	V
Ripple Rejection	NJM2386ADL3-33	RR	V_{IN}=V_O+2V, ein=0.5Vrms,f=120Hz	54	67	-	dB
	NJM2386ADL3-05			54	67	-	
	NJM2386ADL3-08			52	65	-	
	NJM2386ADL3-09			52	65	-	
	NJM2386ADL3-12			50	63	-	
ON Control Voltage		$V_{CONT(ON)}$		2.0(*2)	-	-	V
OFF Control Voltage		$V_{CONT(OFF)}$		-	-	0.4	V
ON Control Current		$I_{CONT(ON)}$	V_C=2.7V	10	30	50	µA
OFF Control Current		$I_{CONT(OFF)}$	V_C=0.4V	1	3	5	µA

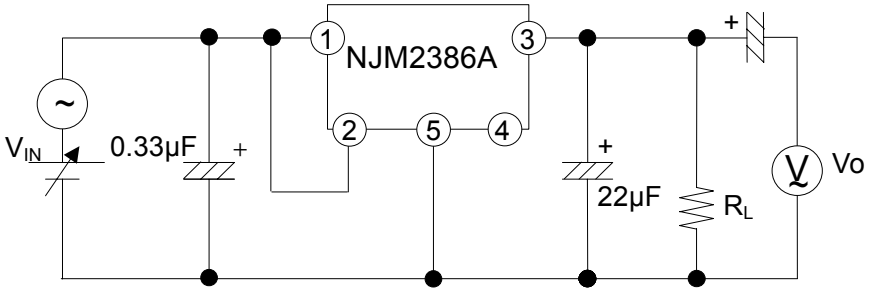
(*2): When ON/OFF CONTROL Terminal is open, Output Voltage is ON.

■ TEST CIRCUIT

● Standard Test Circuit

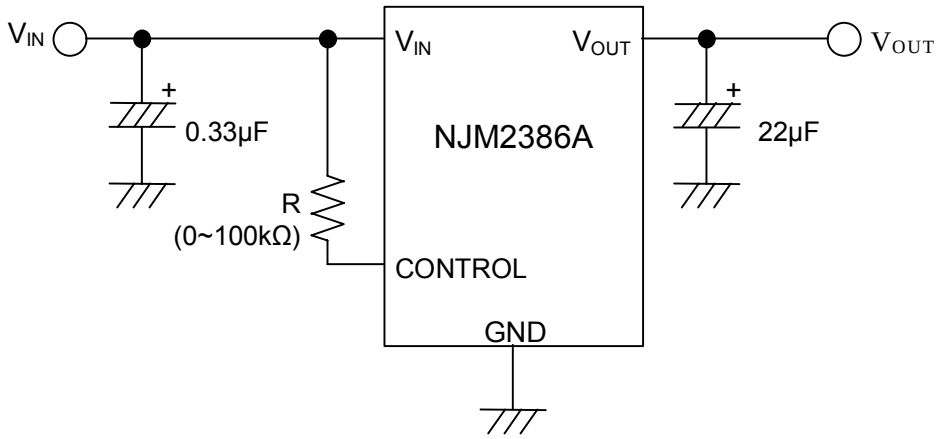


● Ripple Rejection Test Circuit



■ TYPICAL APPLICATION

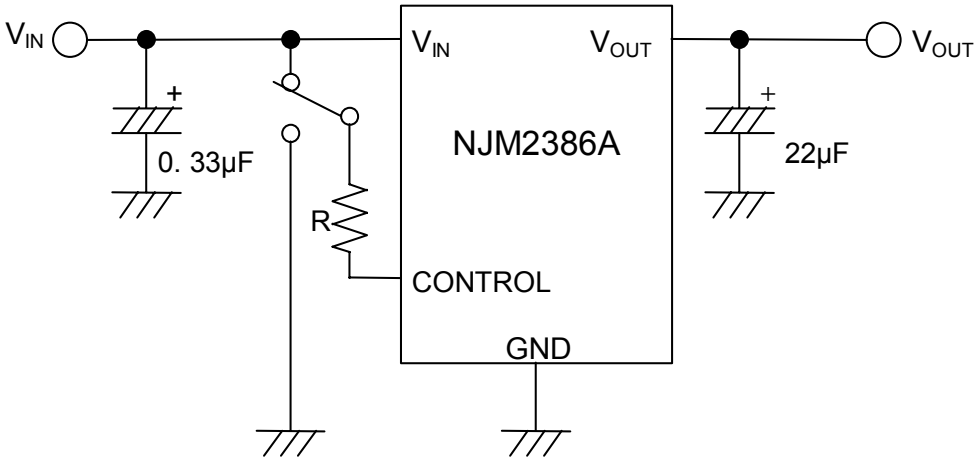
① In the case where ON/OFF Control is not required:



Connect control terminal to V_{IN} terminal.

The quiescent current can be reduced by using a resistance "R". Instead, it increases the minimum operating voltage. For further information, please refer to Figure "Output Voltage vs. Control Voltage".

② In use of ON/OFF CONTROL:

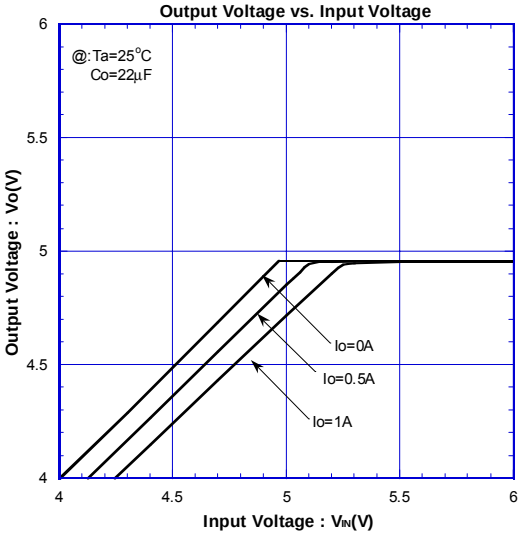


State of control terminal:

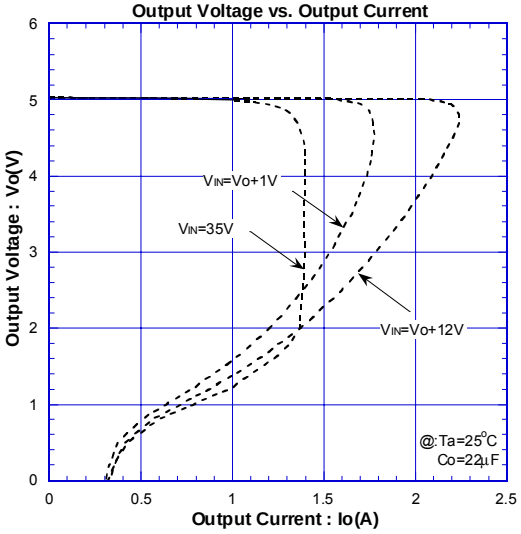
- "H" → output is enabled.
- "L" or "open" → output is disabled.

■ TYPICALCHARACTERISTICS

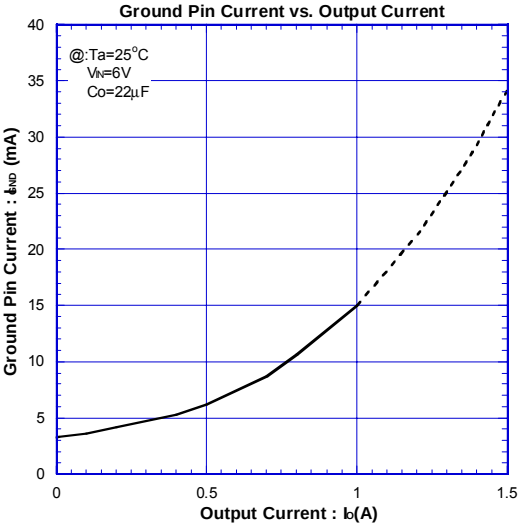
NJM2386A_5.0V
Output Voltage vs. Input Voltage



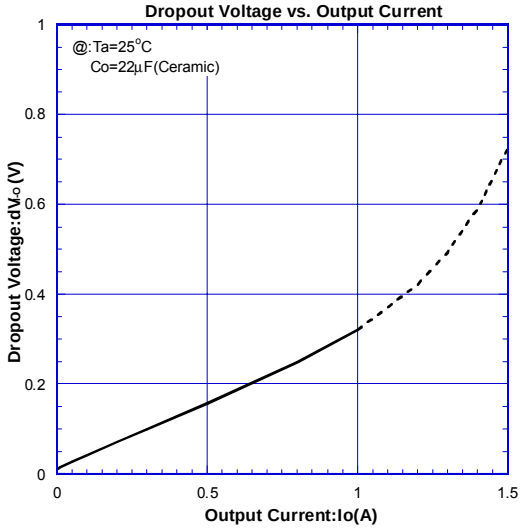
NJM2386A_5.0V
Output Voltage vs. Output Current



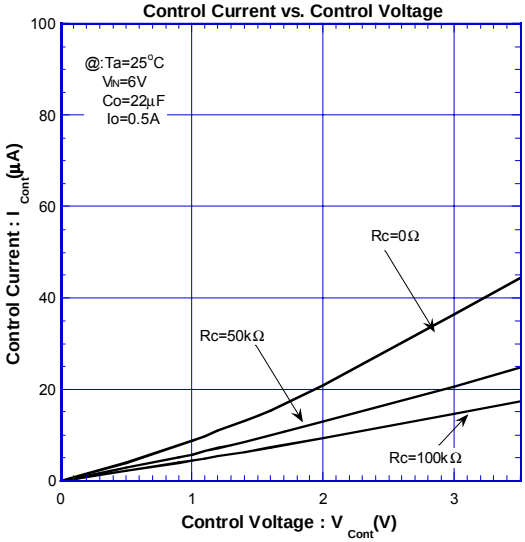
NJM2386A_5.0
Ground Pin Current vs. Output Current



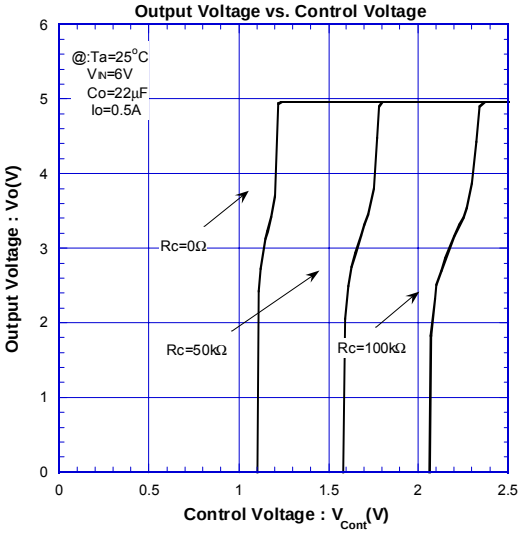
NJM2386A_5.0V
Dropout Voltage vs. Output Current



NJM2386A_5.0V
Control Current vs. Control Voltage

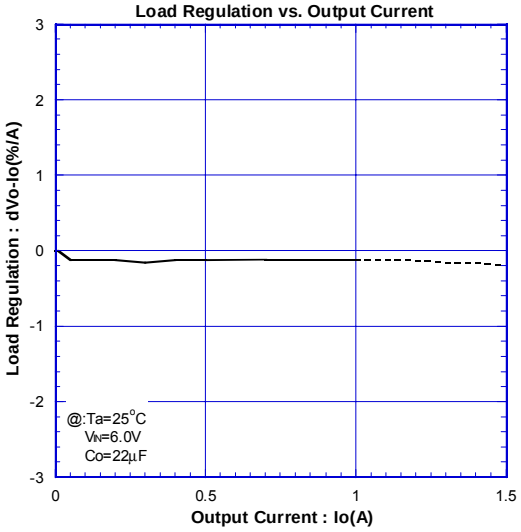


NJM2386A_5.0V
Output Voltage vs. Control Voltage

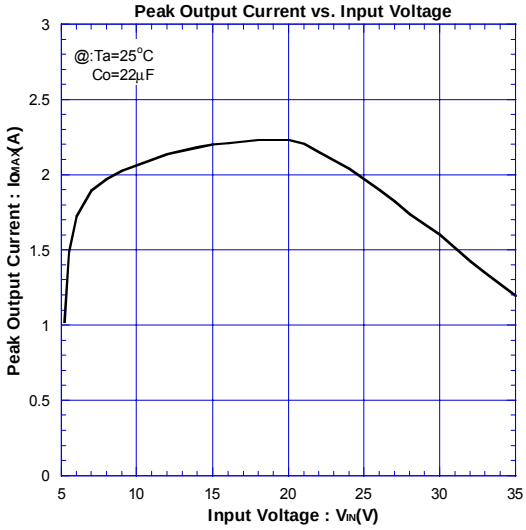


■ TYPICALCHARACTERISTICS

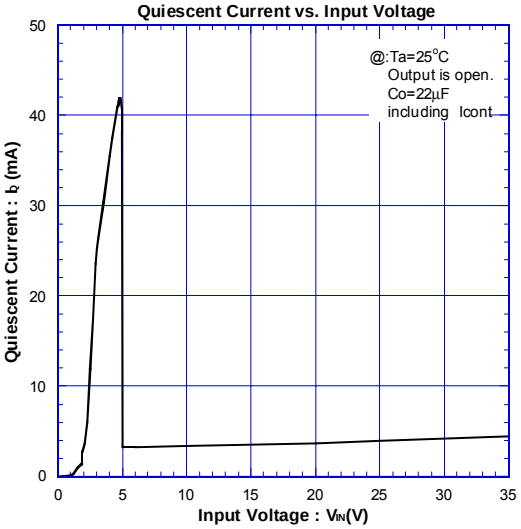
NJM2386A_5.0V
Load Regulation vs. Output Current



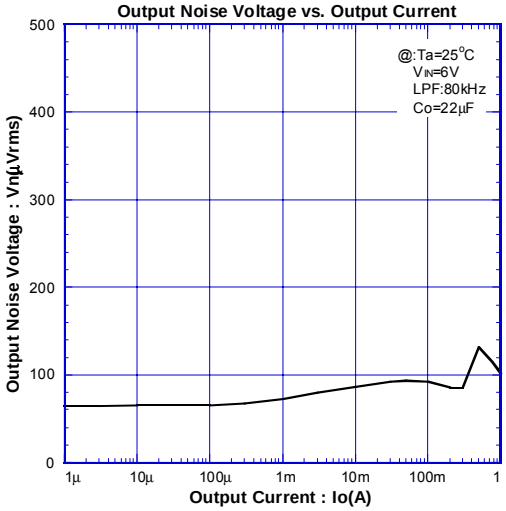
NJM2386A_5.0V
Peak Output Current vs. Input Voltage



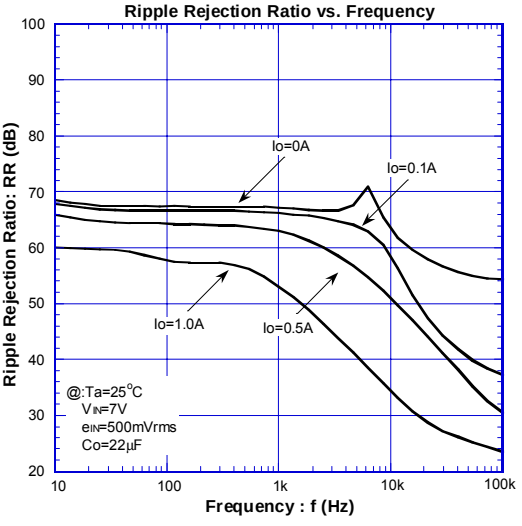
NJM2386A_5.0V
Quiescent Current vs. Input Voltage



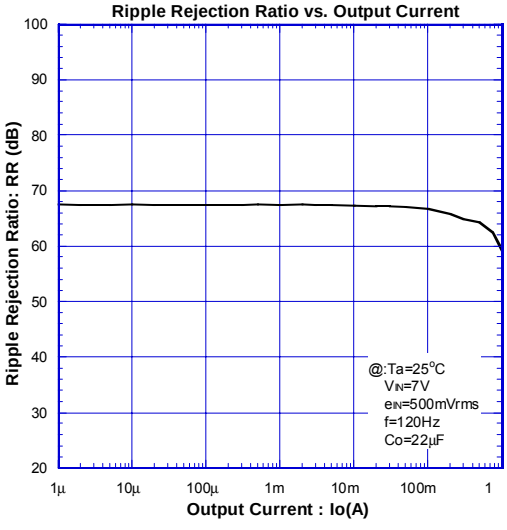
NJM2386A_5.0V
Output Noise Voltage vs. Output Current



NJM2386A_5.0V
Ripple Rejection Ratio vs. Frequency

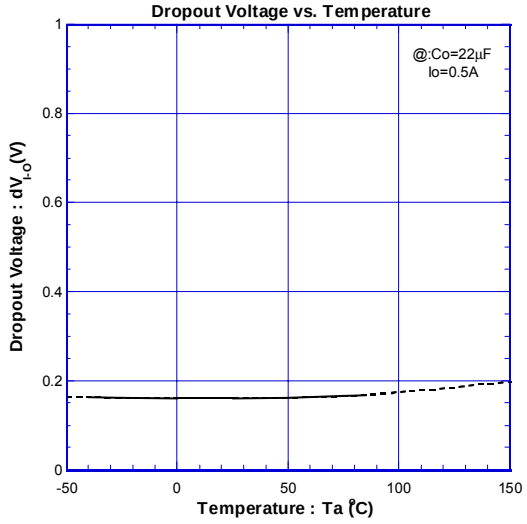


NJM2386A_5.0V
Ripple Rejection Ratio vs. Output Current

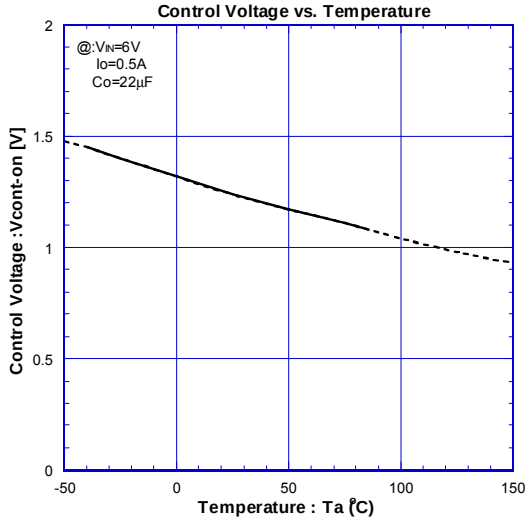


■ TYPICALCHARACTERISTICS

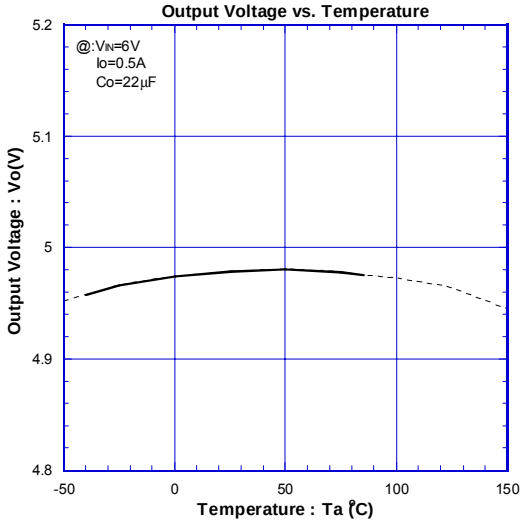
NJM2386A_5.0V
Dropout Voltage vs. Temperature



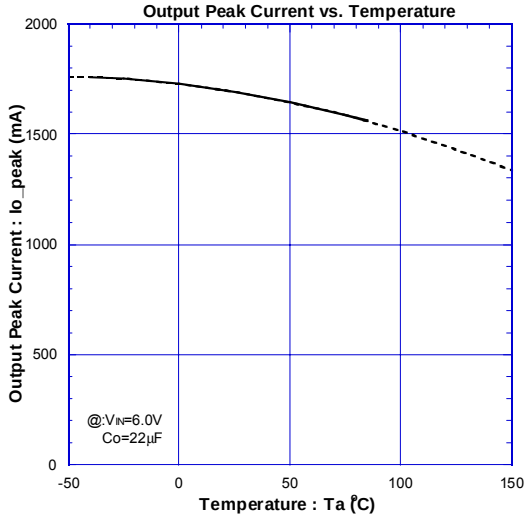
NJM2386A_5.0V
Control Voltage vs. Temperature



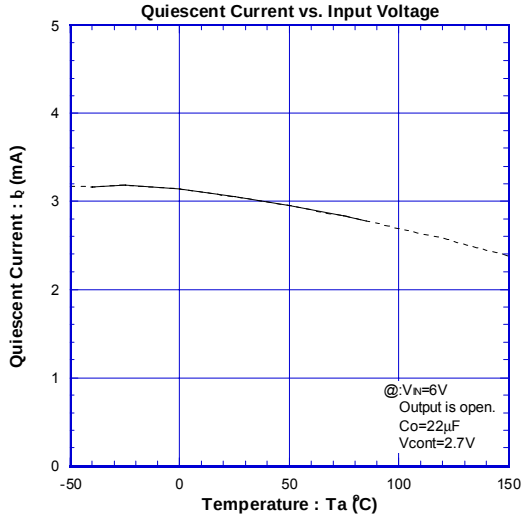
NJM2386A_5.0V
Output Voltage vs. Temperature



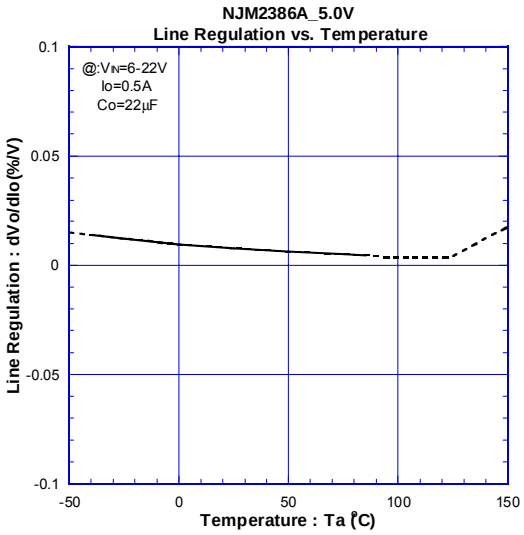
NJM2386A_5.0V
Output Peak Current vs. Temperature

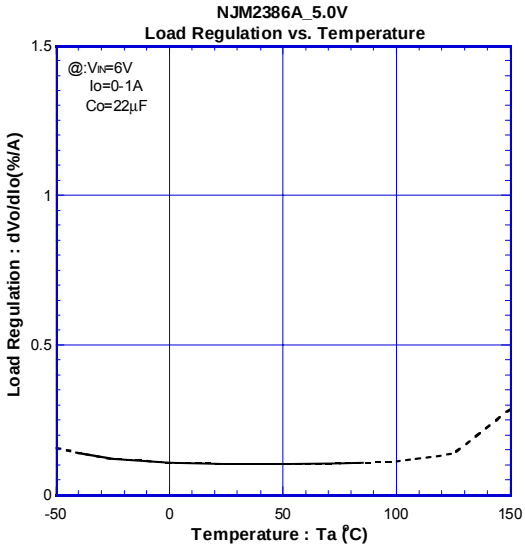


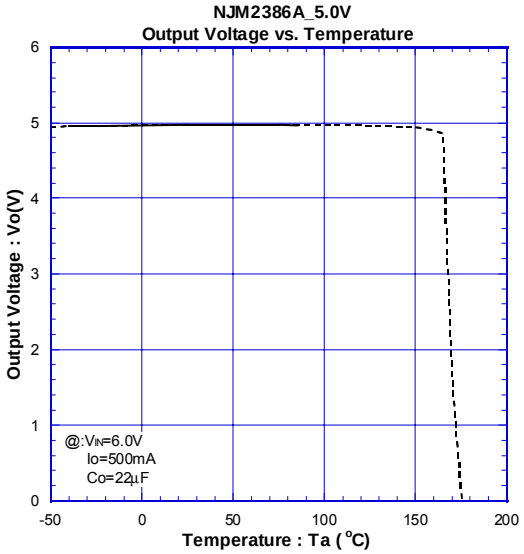
NJM2386A_5.0V
Quiescent Current vs. Input Voltage

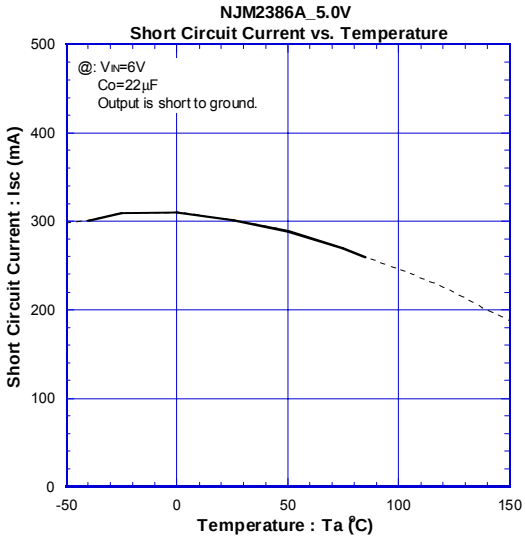


■ TYPICALCHARACTERISTICS



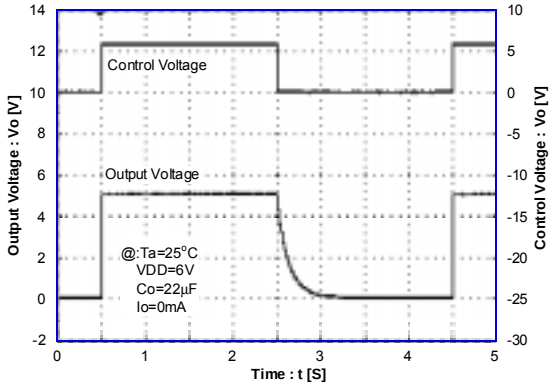




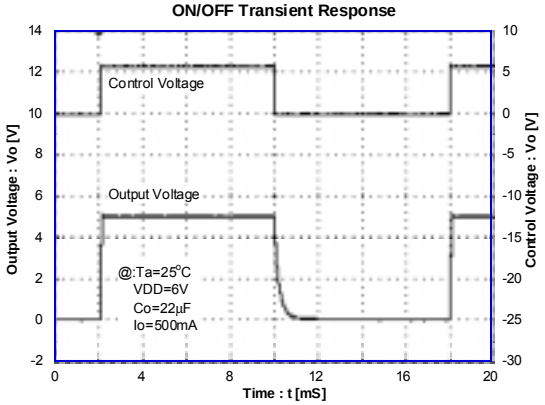


■ TYPICALCHARACTERISTICS

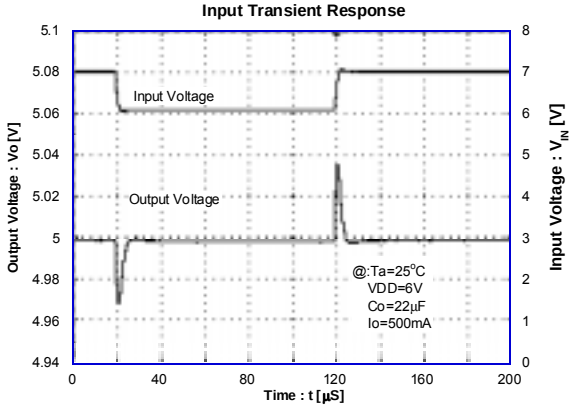
NJM2386A_5.0V
ON/OFF Transient Response without Load



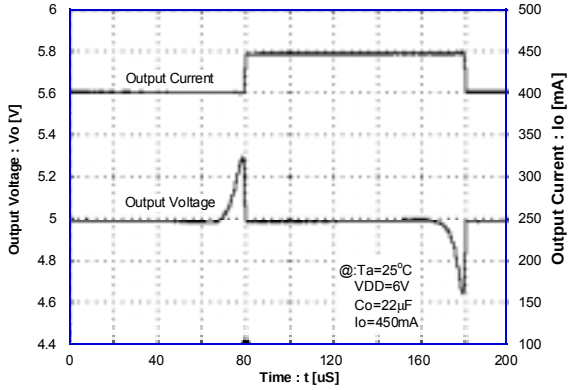
NJM2386A_5.0V
ON/OFF Transient Response



NJM2386A_5.0V
Input Transient Response



NJM2386A_5.0V
Load Transient Response



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