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New Japan Radio Co.,Ltd.

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## LOW DROPOUT VOLTAGE REGULATOR WITH ON/OFF CONTROL

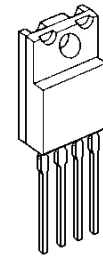
### ■ GENERAL DESCRIPTION

The NJM2396 is low dropout voltage regulator with ON/OFF control.

The output current is up to 1.5A and dropout voltage is 0.2Vtyp. at  $I_o=0.5A$ .

The NJM2396 is suitable for power module, TV, Display, car stereo and low power applications.

### ■ PACKAGE OUTLINE

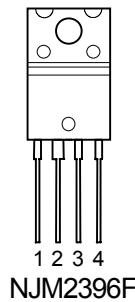


NJM2396F

### ■ FEATURE

- Low Dropout Voltage       $\Delta V_{I-O}=0.2V$  typ. at  $I_o=0.5A$
- Output Current               $I_o(\text{max.})=1.5A$
- ON/OFF Control
- Internal Short Circuit Current Limit
- Internal Overvoltage Protection
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline              TO-220F-4

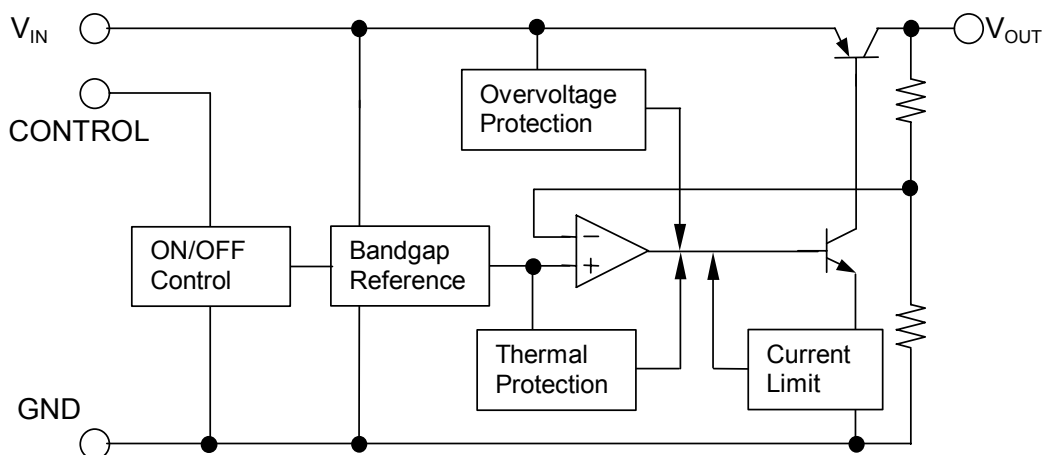
### ■ PIN CONFIGURATION



#### PIN FUNCTION

1.  $V_{IN}$
2.  $V_{OUT}$
3. GND
4. ON/OFF CONTROL

### ■ EQUIVALENT CIRCUIT



# NJM2396

## ■ OUTPUT VOLTAGE RANK LIST

Device Name	V <sub>OUT</sub>
NJM2396F33	3.3V
NJM2396F05	5.0V
NJM2396F63	6.3V
NJM2396F08	8.0V
NJM2396F83	8.3V
NJM2396F09	9.0V
NJM2396F12	12.0V

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V <sub>IN</sub>	+35	V
Control Voltage	V <sub>CONT</sub>	+35(*1)	V
Output Current	I <sub>o</sub>	1.5	A
Power Dissipation	P <sub>D</sub>	18(Tc<50°C)	W
Operating Junction Temperature Range	T <sub>j</sub>	-40 to +150	°C
Operating Temperature Range	T <sub>opr</sub>	-40 to 85	°C
Storage Temperature Range	T <sub>stg</sub>	-50 to 150	°C

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

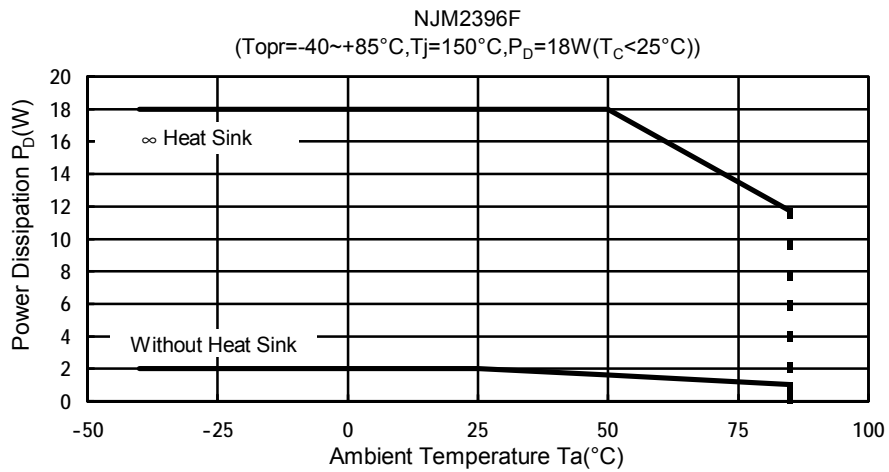
## ■ ELECTRICAL CHARACTERISTICS (V<sub>IN</sub>=V<sub>O</sub>+1V, I<sub>o</sub>=0.5A, C<sub>IN</sub>=0.33μF, C<sub>o</sub>=22μF, T<sub>j</sub>=25°C)

Measurement is to be conducted is pulse testing.

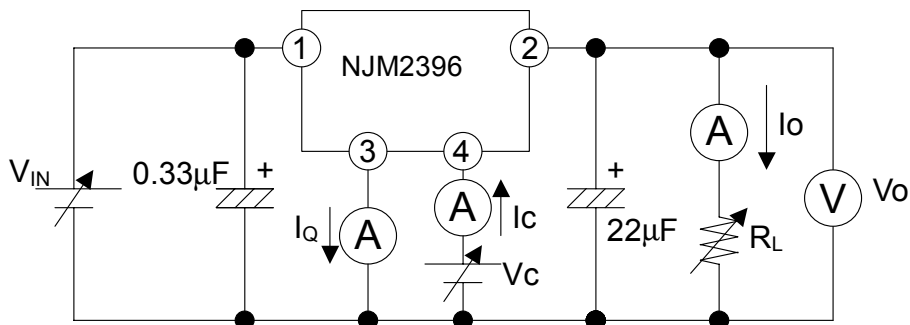
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V <sub>o</sub>	V <sub>IN</sub> =V <sub>O</sub> +1V	-4%	-	+4%	V
Line Regulation	ΔV <sub>o</sub> /ΔV <sub>IN</sub>	V <sub>IN</sub> =V <sub>O</sub> +1V to V <sub>O</sub> +17V	-	0.04	0.16	%/V
Load Regulation	ΔV <sub>o</sub> /ΔI <sub>o</sub>	V <sub>IN</sub> =V <sub>O</sub> +2V, I <sub>o</sub> =0A to 1.5A	-	0.2	1.4	%/A
Average Temperature Coefficient of Output Voltage	ΔV <sub>o</sub> /ΔT	T <sub>j</sub> =0 to 125°C	-	±0.02	-	%/°C
Standby Current	I <sub>Q</sub>	I <sub>o</sub> =0A	-	-	5	mA
Dropout Voltage	ΔV <sub>I-O</sub>	I <sub>o</sub> =0.5A	-	0.2	0.5	V
Ripple Rejection	NJM2396F33	RR V <sub>IN</sub> =V <sub>O</sub> +2V e <sub>in</sub> =0.5Vrms, f=120Hz	52	60	-	dB
	NJM2396F05		52	60	-	
	NJM2396F63		52	60	-	
	NJM2396F08		50	58	-	
	NJM2396F83		50	58	-	
	NJM2396F09		50	58	-	
	NJM2396F12		48	58	-	
ON Control Voltage	V <sub>CONT(ON)</sub>		2.0(*2)	-	-	V
OFF Control Voltage	V <sub>CONT(OFF)</sub>		-	-	0.4	V
ON Control Current	I <sub>CONT(ON)</sub>	V <sub>C</sub> =2.7V	-	-	20	μA
OFF Control Current	I <sub>CONT(OFF)</sub>	V <sub>C</sub> =0.4V	-	-	-20	μA

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

## POWER DISSIPATION vs. AMBIENT TEMPERATURE



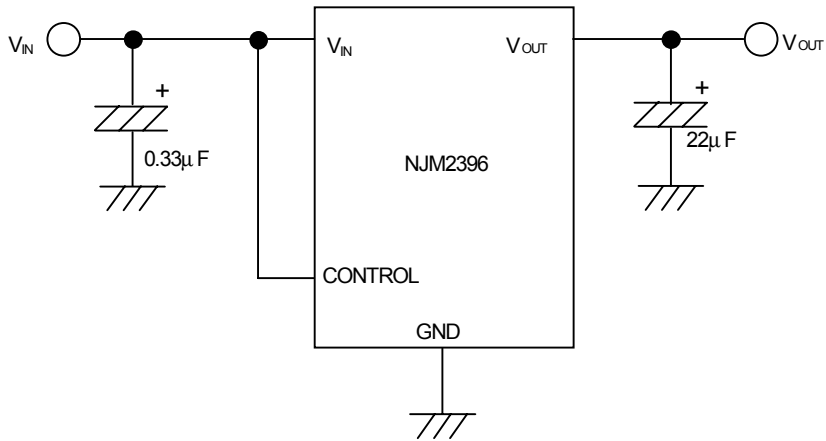
## TEST CIRCUIT



# NJM2396

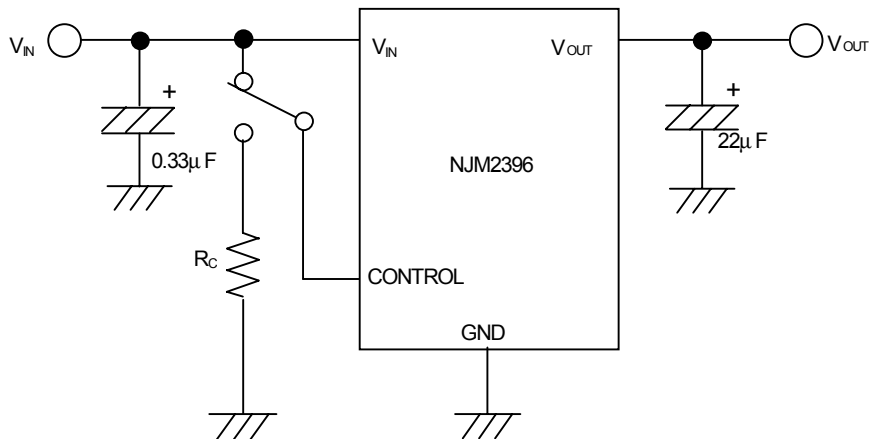
## ■ TYPICAL APPLICATION

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



Connect control terminal to  $V_{IN}$  terminal or open.

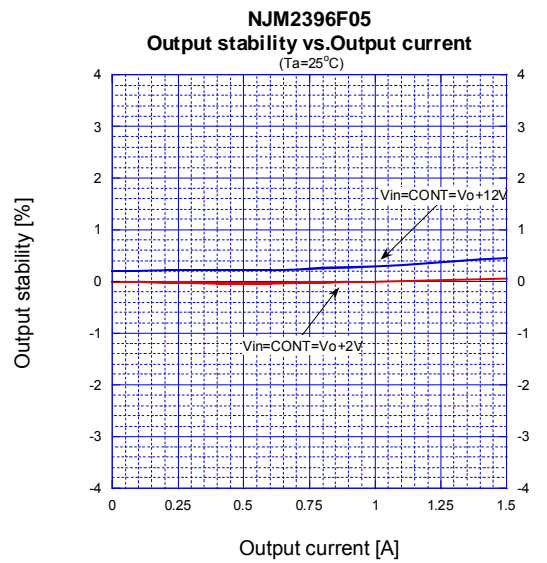
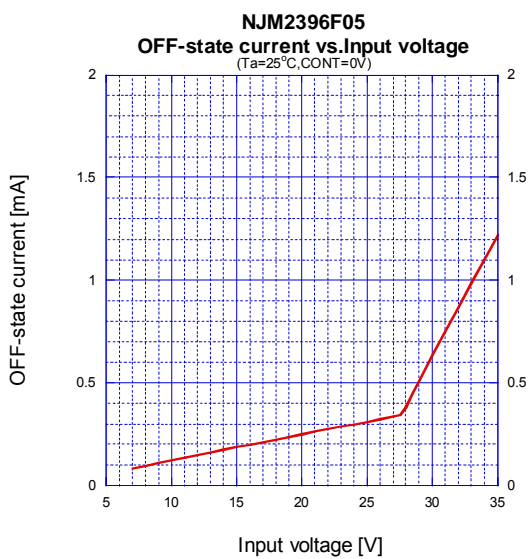
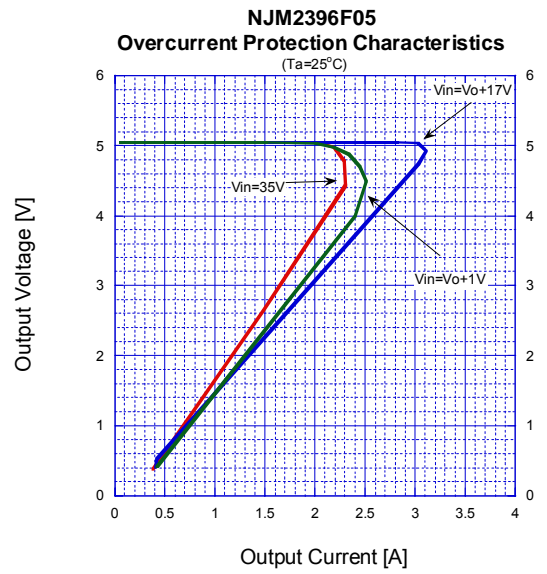
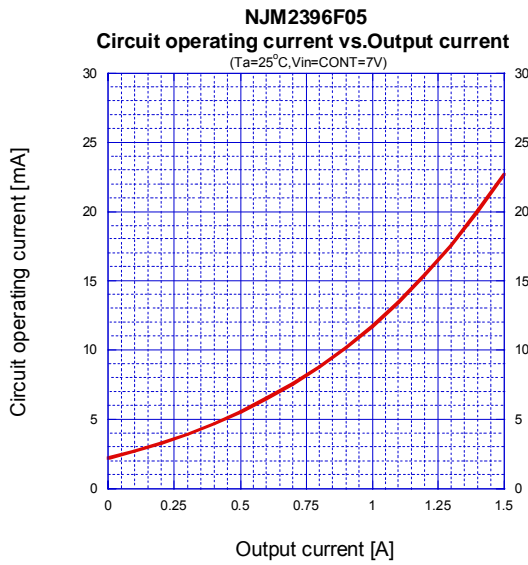
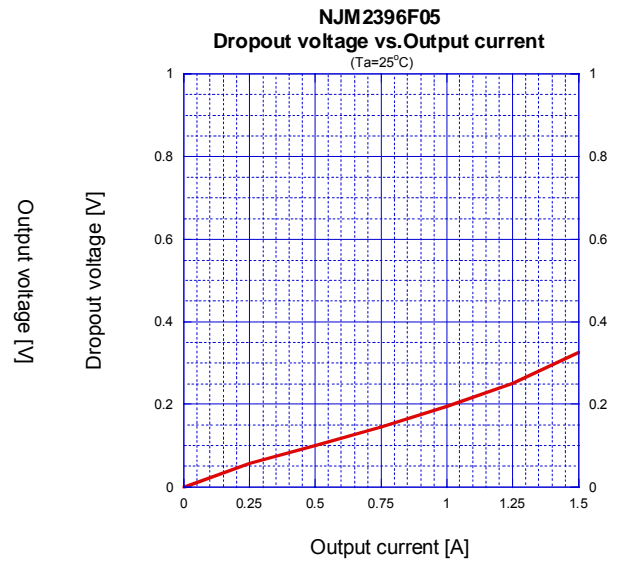
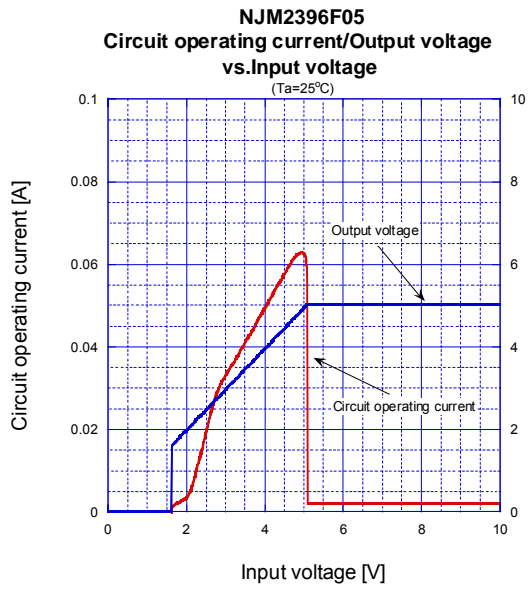
② In use of ON/OFF CONTROL:



State of control terminal:

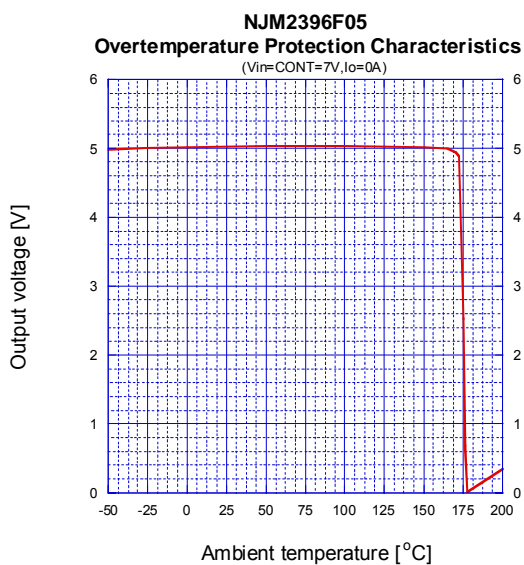
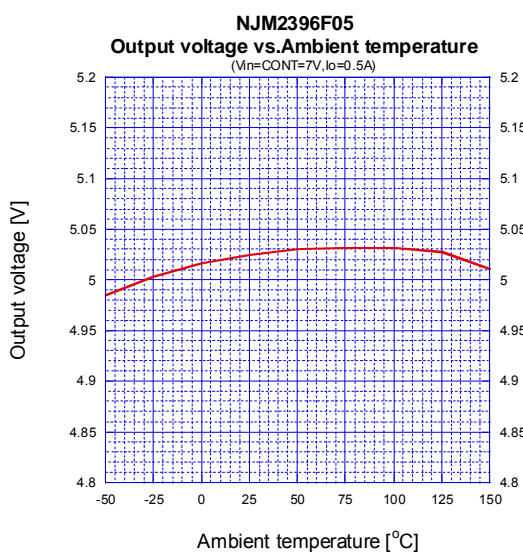
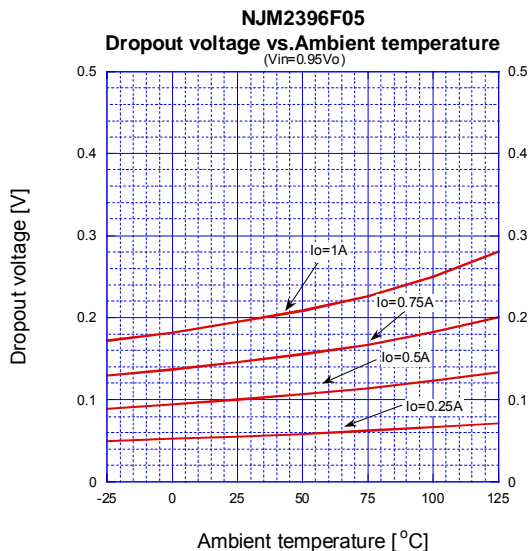
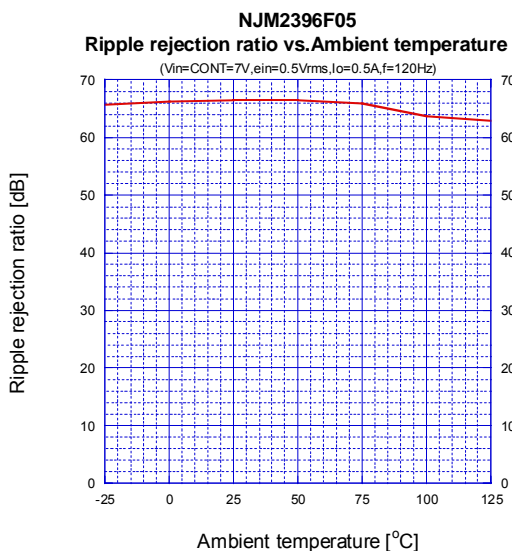
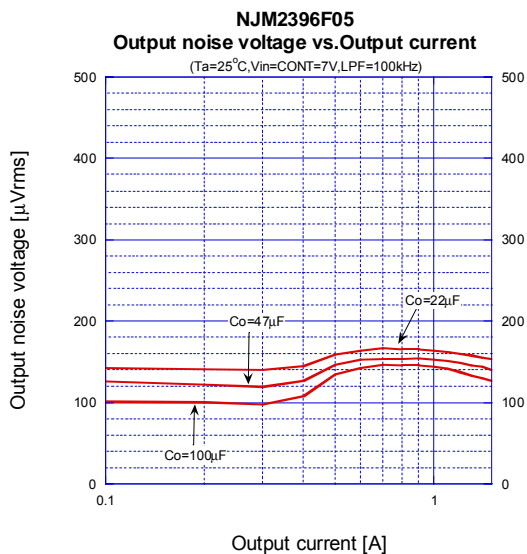
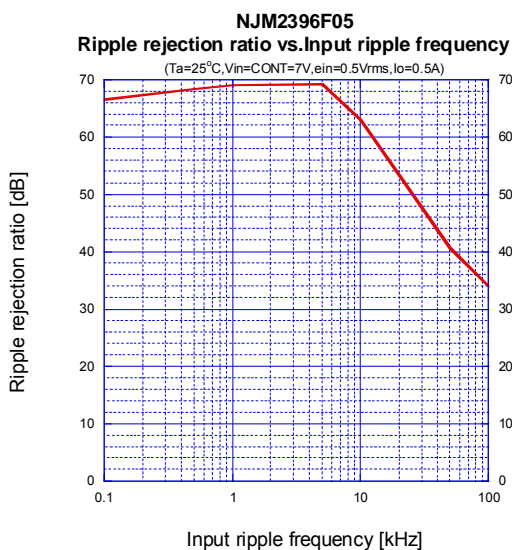
- “H” or “open” → output is enabled.
- “L” → output is disabled.

## TYPICAL CHARACTERISTICS

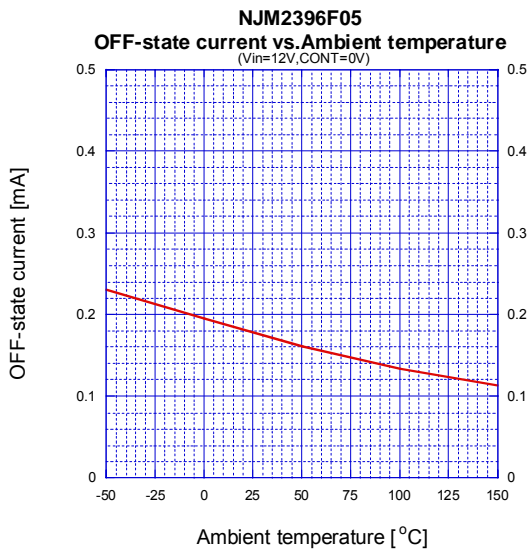
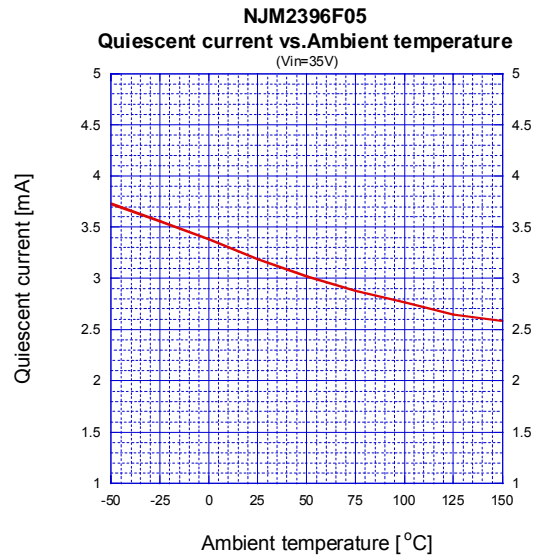
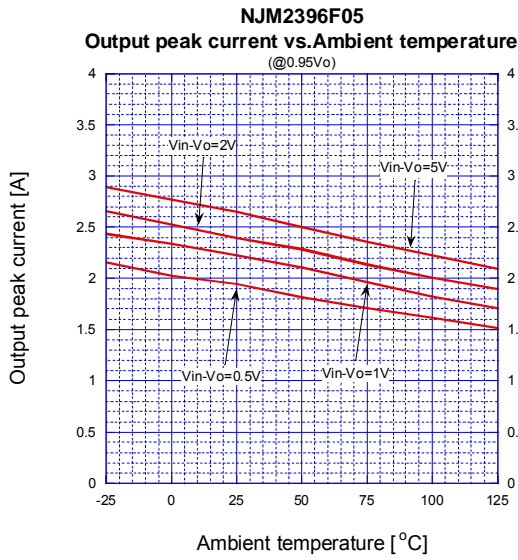


# NJM2396

## TYPICAL CHARACTERISTICS



## ■ TYPICAL CHARACTERISTICS



**[CAUTION]**

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