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New Japan Radio Co.,Ltd.

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LOW DROPOUT VOLTAGE REGULATOR WITH ON/OFF CONTROL

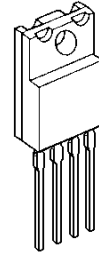
■ GENERAL DESCRIPTION

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

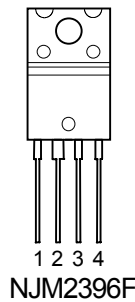


NJM2396F

■ 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

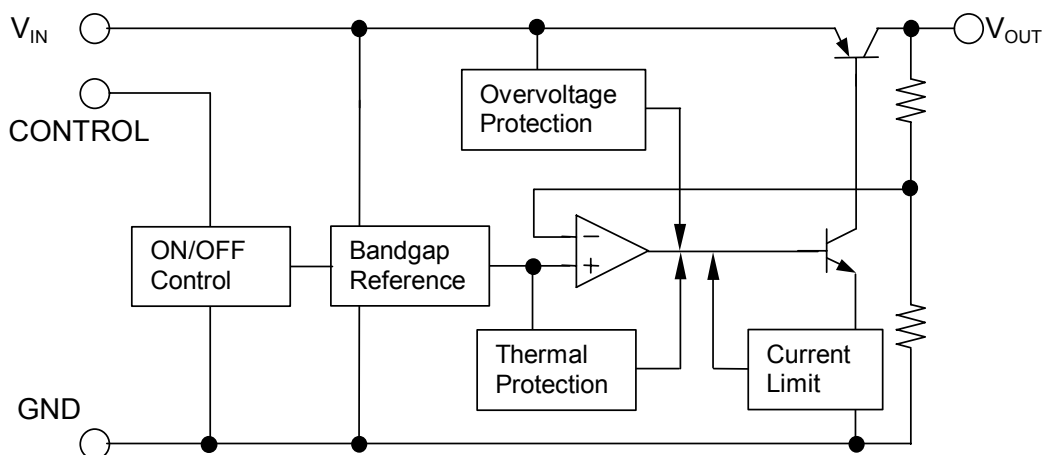
■ PIN CONFIGURATION



PIN FUNCTION

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

■ EQUIVALENT CIRCUIT



NJM2396

■ OUTPUT VOLTAGE RANK LIST

Device Name	V _{OUT}
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 _{IN}	+35	V
Control Voltage	V _{CONT}	+35(*1)	V
Output Current	I _o	1.5	A
Power Dissipation	P _D	18(Tc<50°C)	W
Operating Junction Temperature Range	T _j	-40 to +150	°C
Operating Temperature Range	T _{opr}	-40 to 85	°C
Storage Temperature Range	T _{stg}	-50 to 150	°C

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

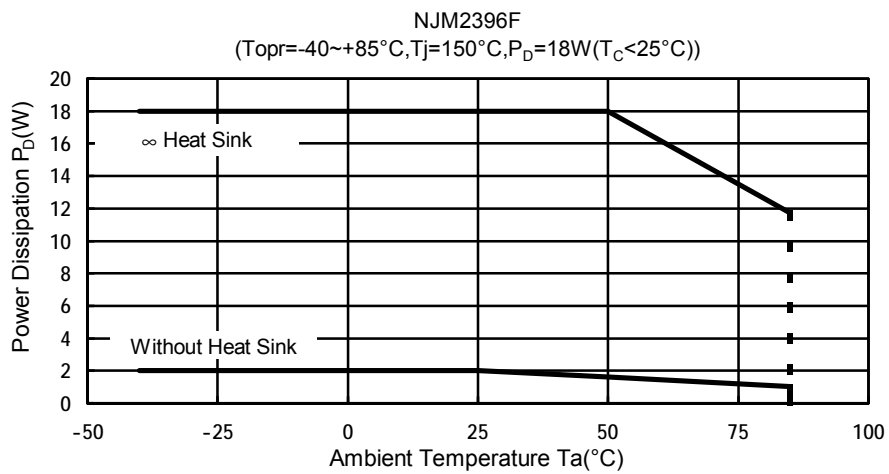
■ ELECTRICAL CHARACTERISTICS (V_{IN}=V_O+1V, I_o=0.5A, C_{IN}=0.33μF, C_o=22μF, T_j=25°C)

Measurement is to be conducted is pulse testing.

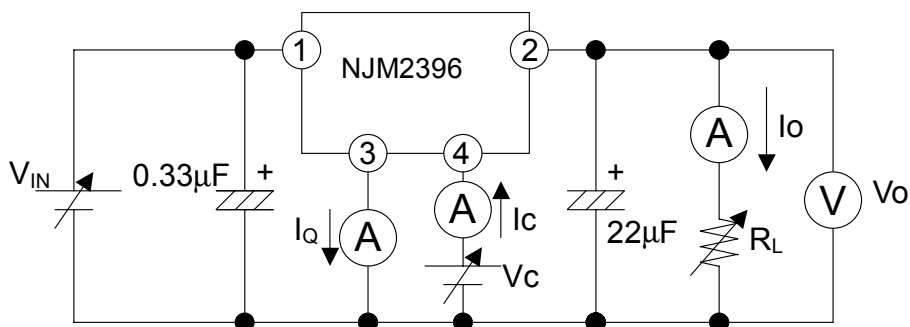
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _o	V _{IN} =V _O +1V	-4%	-	+4%	V
Line Regulation	ΔV _o /ΔV _{IN}	V _{IN} =V _O +1V to V _O +17V	-	0.04	0.16	%/V
Load Regulation	ΔV _o /ΔI _o	V _{IN} =V _O +2V, I _o =0A to 1.5A	-	0.2	1.4	%/A
Average Temperature Coefficient of Output Voltage	ΔV _o /ΔT	T _j =0 to 125°C	-	±0.02	-	%/°C
Standby Current	I _Q	I _o =0A	-	-	5	mA
Dropout Voltage	ΔV _{I-O}	I _o =0.5A	-	0.2	0.5	V
Ripple Rejection	NJM2396F33	RR V _{IN} =V _O +2V e _{in} =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 _{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	-	-	20	μA
OFF Control Current	I _{CONT(OFF)}	V _C =0.4V	-	-	-20	μA

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

POWER DISSIPATION vs. AMBIENT TEMPERATURE



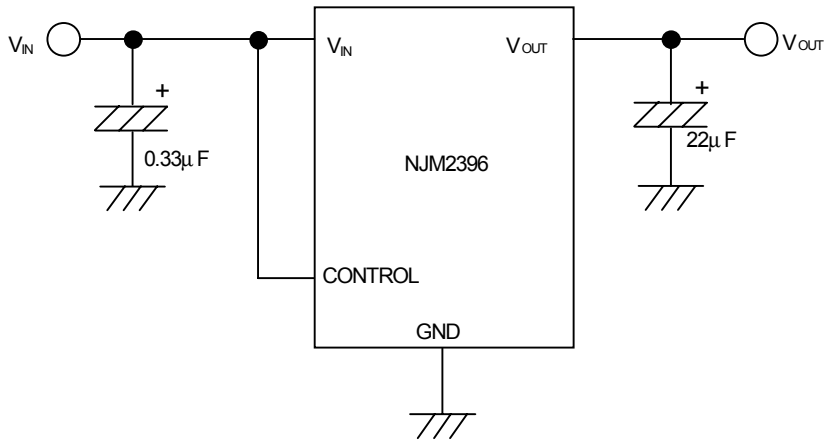
TEST CIRCUIT



NJM2396

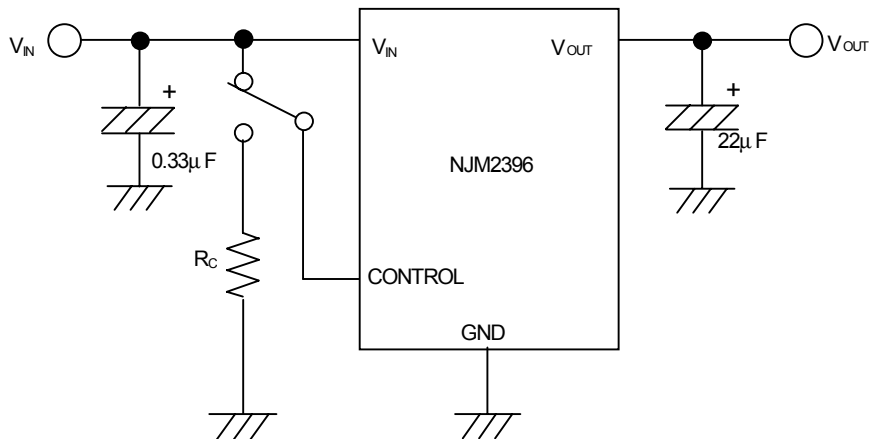
■ TYPICAL APPLICATION

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



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

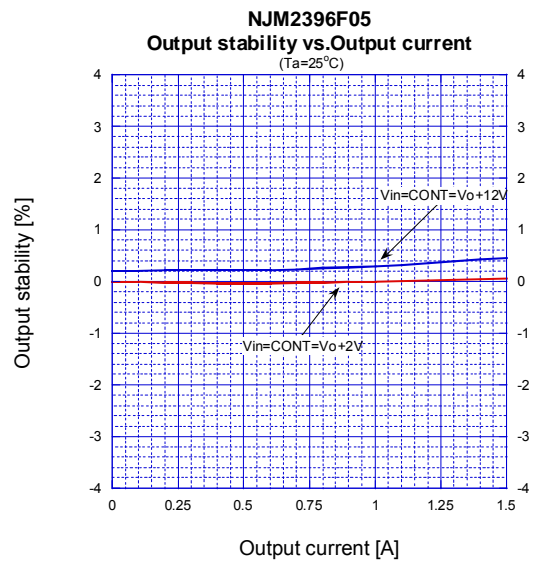
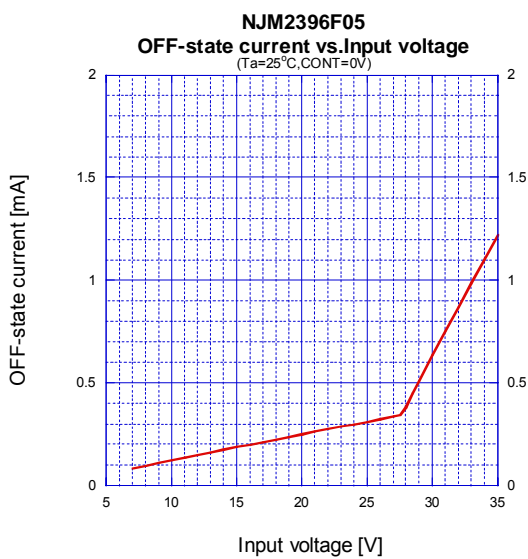
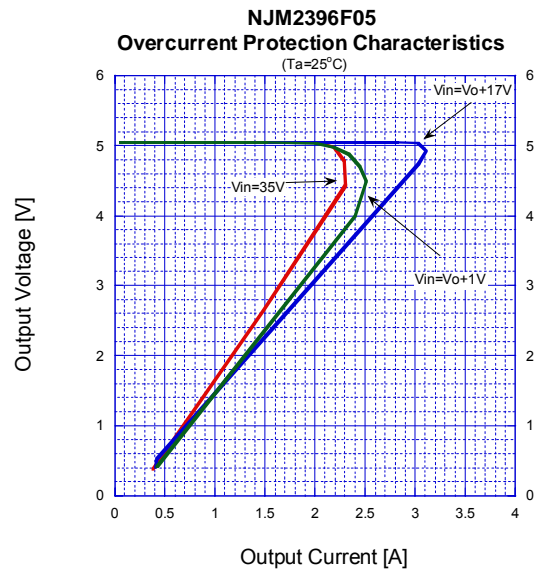
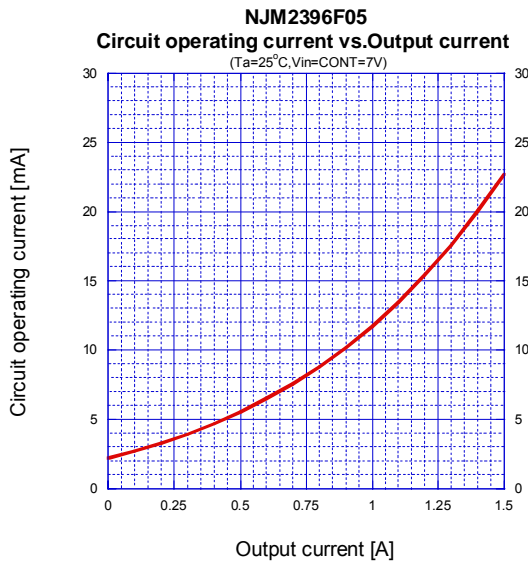
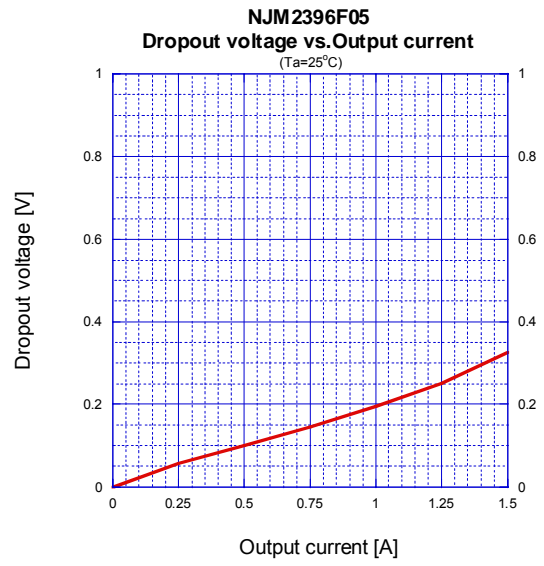
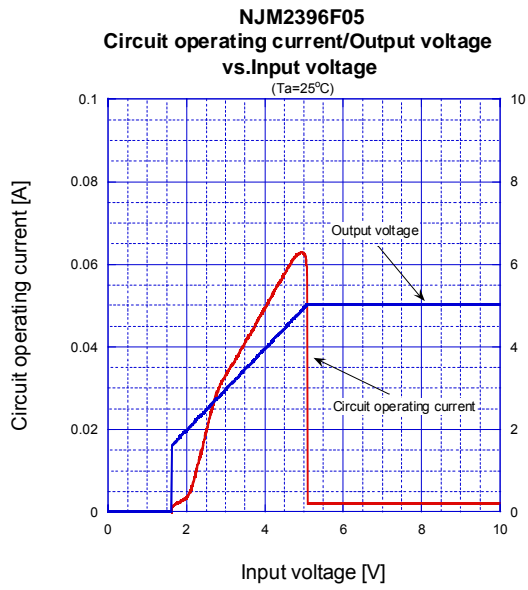
② In use of ON/OFF CONTROL:



State of control terminal:

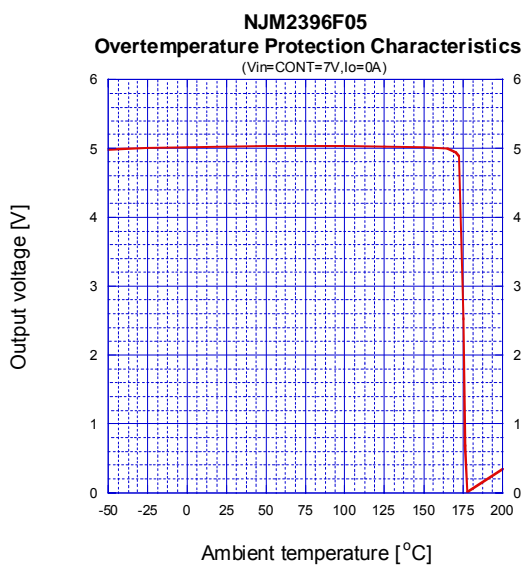
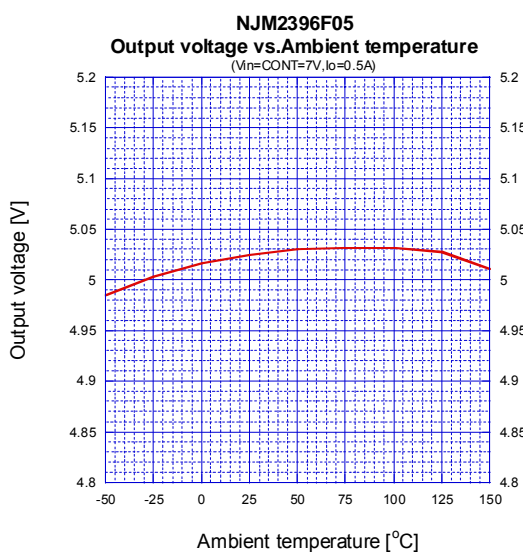
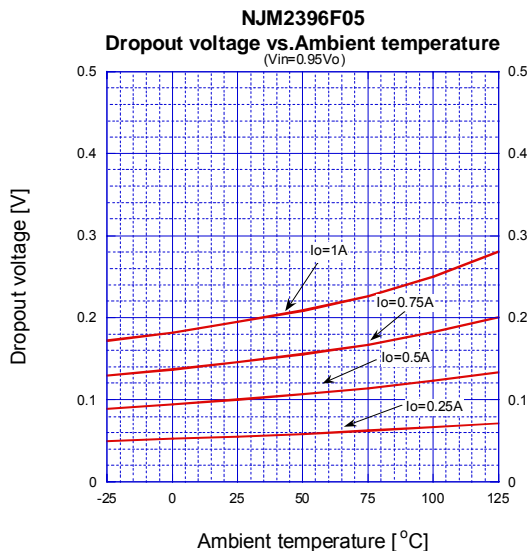
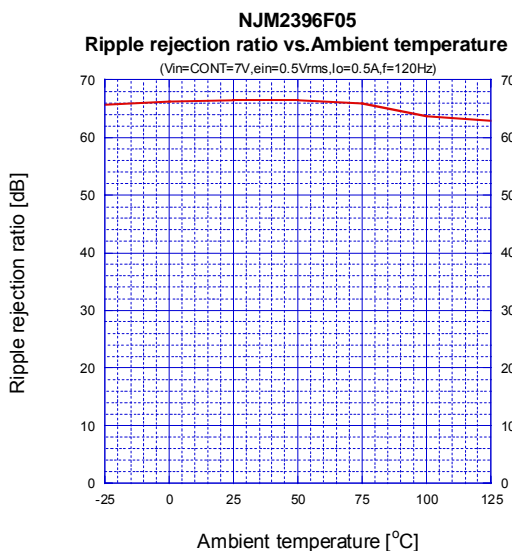
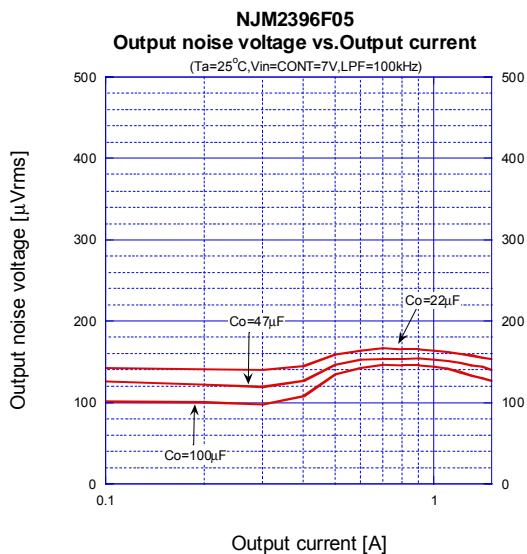
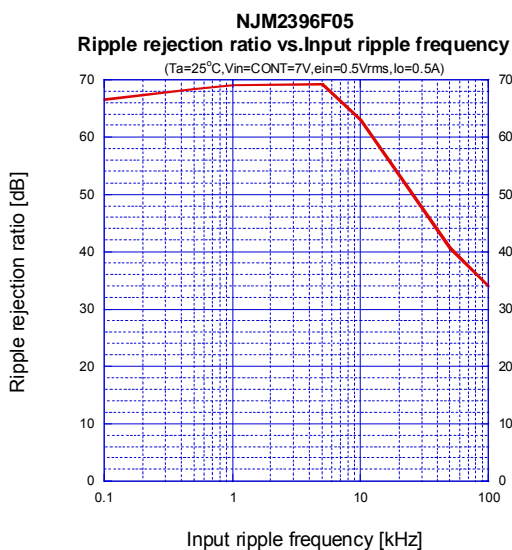
- “H” or “open” → output is enabled.
- “L” → output is disabled.

TYPICAL CHARACTERISTICS

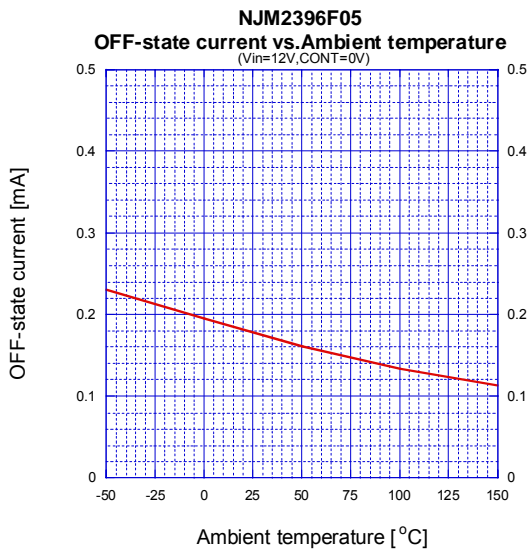
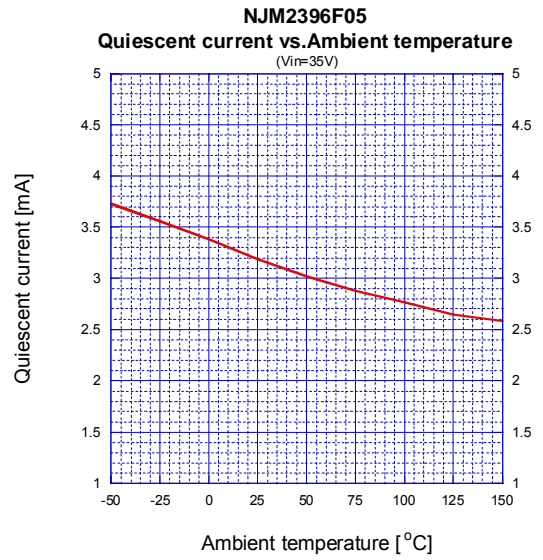
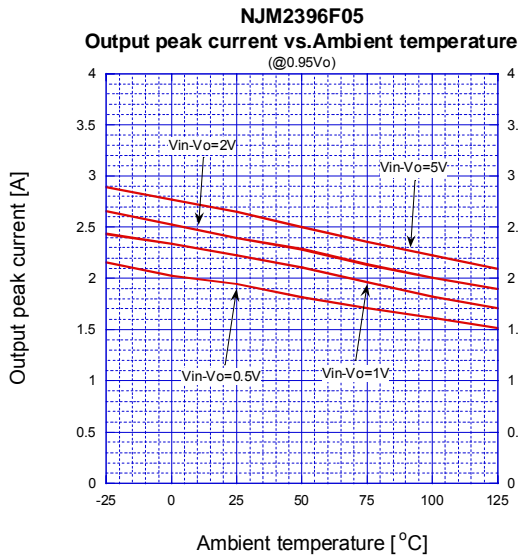


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TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



[CAUTION]

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