

## LOW DROPOUT VOLTAGE REGULATOR

### ■ GENERAL DESCRIPTION

NJU7771/72/73/74/75/76 is a low dropout voltage regulator designed for cellular phone application etc.

Advanced CMOS technology achieves high ripple rejection and low quiescent current.

When the ON/OFF control is used, NJU7774/75/76 has high transition response characteristics for shunt switch.

### ■ FEATURES

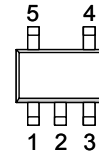
- High Ripple Rejection      65dB typ. (f=1kHz, Vo=3.0V version)
- Low quiescent Current      Iq=18μA (Io=0mA)
- Output capacitor with 1.0μF ceramic capacitor (Vo≤2.0V version)
- Output Current              Io(max.)=150mA
- High Precision Output      Vo±1.0%
- Low Dropout Voltage        0.15V typ. (Io=100mA, Vo=3.0V)
- Input Voltage Range        VIN=+2.3V~14V (Vo≤2.0V version)
- ON/OFF Control              (Active High)
- With Shunt Switch          Only NJU7774/75/76
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- CMOS Technology
- Package Outline              SOT-23-5 (MTP5)

### ■ PACKAGE OUTLINE



NJU777\*F

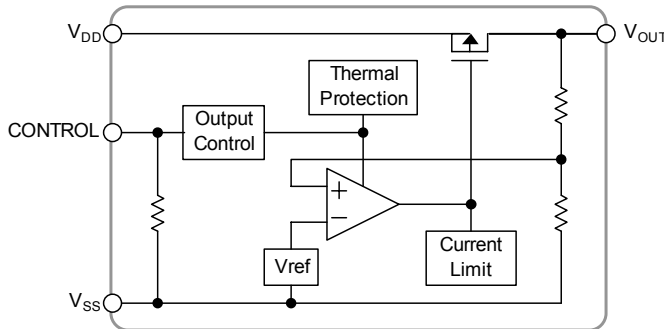
### ■ PIN CONFIGURATION



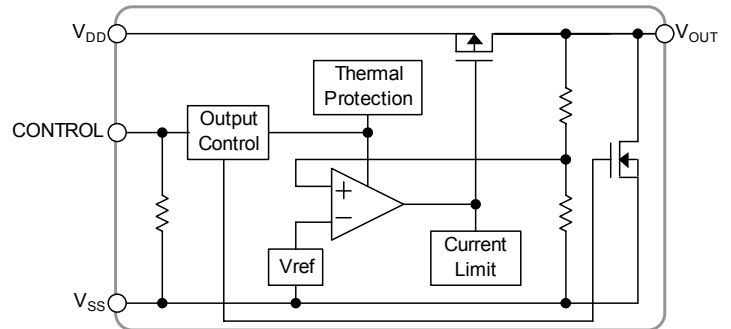
PIN FUNCTION

1.CONTROL	1.V <sub>IN</sub>	1.V <sub>OUT</sub>
2.GND	2.GND	2.GND
3.NC	3.CONTROL	3.V <sub>IN</sub>
4.V <sub>OUT</sub>	4.NC	4.CONTROL
5.V <sub>IN</sub>	5.V <sub>OUT</sub>	5.NC
NJU7771F	NJU7772F	NJU7773F
NJU7774F	NJU7775F	NJU7776F

### ■ EQUIVALENT CIRCUIT



NJM7771/72/73



NJM7774/75/76

### ■ OUTPUT VOLTAGE RANK LIST

Device Name	V <sub>OUT</sub>	Device Name	V <sub>OUT</sub>	Device Name	V <sub>OUT</sub>
NJU777×F15	1.5V	NJU777×F27	2.7V	NJU777×F38	3.8V
NJU777×F21	2.1V	NJU777×F28	2.8V	NJU777×F05	5.0V
NJU777×F22	2.2V	NJU777×F03	3.0V		
NJU777×F23	2.3V	NJU777×F33	3.3V		
NJU777×F25	2.5V	NJU777×F35	3.5V		

# NJU7771/72/73/74/75/76

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V <sub>IN</sub>	+10	V
Control Voltage	V <sub>CONT</sub>	+10(*note 1)	V
Power Dissipation	P <sub>D</sub>	200	mW
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +125	°C
OFF-state Output Sink Current(*note2)	I <sub>o</sub>	10	mA

(\*note 1): When input voltage is less than +10V, the absolute maximum control voltage is equal to the input voltage.

(\*note 2): This maximum rating is applied to NJU7774/75/76.

## ■ ELECTRICAL CHARACTERISTICS

(V<sub>IN</sub>=V<sub>o</sub>+1V, C<sub>IN</sub>=0.1μF, C<sub>o</sub>=1.0μF(C<sub>o</sub>=2.2μF: V<sub>o</sub>≤2.0V), Ta=25°C)

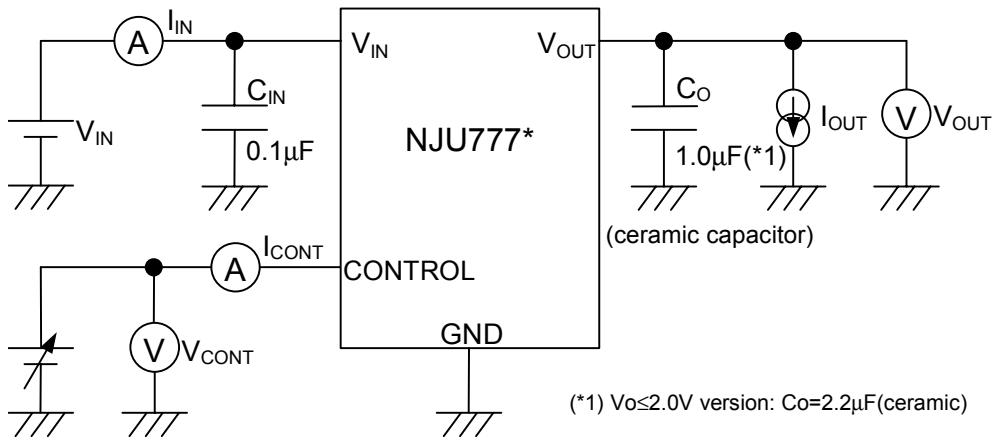
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V <sub>o</sub>	I <sub>o</sub> =30mA	-1.0%	-	+1.0%	V
Input Voltage	V <sub>IN</sub>		2	V <sub>o</sub> +1V	9	V
Quiescent Current	I <sub>Q</sub>	I <sub>o</sub> =0mA, V <sub>CONT</sub> =V <sub>IN</sub>	-	18	35	μA
Quiescent Current at Control OFF	I <sub>Q(OFF)</sub>	V <sub>CONT</sub> =0V	-	0.1	1	μA
Output Current	I <sub>o</sub>	V <sub>o</sub> -0.1V (V <sub>o</sub> ≤2.0V) V <sub>o</sub> -0.3V (V <sub>o</sub> ≥2.1V)	150	-	-	mA
Short Current Limit	I <sub>LIM</sub>	V <sub>o</sub> =0V	30	50	110	mA
Line Regulation	Δ V <sub>o</sub> /Δ V <sub>IN</sub>	V <sub>IN</sub> =V <sub>o</sub> +1V ~ V <sub>o</sub> +6.0V (V <sub>o</sub> <3.0V) V <sub>IN</sub> =V <sub>o</sub> +1V ~ 9.0V (V <sub>o</sub> ≥3.0V), I <sub>o</sub> =30mA	-	-	0.20	%/V
Load Regulation	Δ V <sub>o</sub> /Δ I <sub>o</sub>	I <sub>o</sub> =0 ~ 100mA	-	-	0.03	%/mA
Dropout Voltage(*note 3)	Δ V <sub>I-O</sub>	I <sub>o</sub> =100mA, 2.1V≤V <sub>o</sub> ≤2.4V	-	0.2	0.3	V
		I <sub>o</sub> =100mA, 2.5V≤V <sub>o</sub> ≤2.7V	-	0.18	0.28	V
		I <sub>o</sub> =100mA, 2.8V≤V <sub>o</sub> ≤3.3V	-	0.15	0.25	V
		I <sub>o</sub> =100mA, 3.4V≤V <sub>o</sub> ≤5.0V	-	0.12	0.22	V
Ripple Rejection	RR	e <sub>in</sub> =200mVrms, f=1kHz, I <sub>o</sub> =10mA, V <sub>o</sub> =3.0V Version	-	65	-	dB
Average Temperature Coefficient of Output Voltage	Δ V <sub>o</sub> /Δ Ta	Ta=0 ~ 85°C, I <sub>o</sub> =10mA	-	±100	-	ppm/°C
Output Noise Voltage	V <sub>NO1</sub>	f=10Hz ~ 80kHz, I <sub>o</sub> =0mA, V <sub>o</sub> =3.0V Version	-	40	-	μVrms
	V <sub>NO2</sub>	f=10Hz ~ 80kHz, I <sub>o</sub> =10mA, V <sub>o</sub> =3.0V Version	-	70	-	μVrms
Pull-down Resistance	R <sub>CONT</sub>		2.5	5	10	MΩ
Control Voltage for ON-state	V <sub>CONT(ON)</sub>		1.6	-	-	V
Control Voltage for OFF-state	V <sub>CONT(OFF)</sub>		0	-	0.3	V

(\*note 3): Except output voltage less than 2.1V.

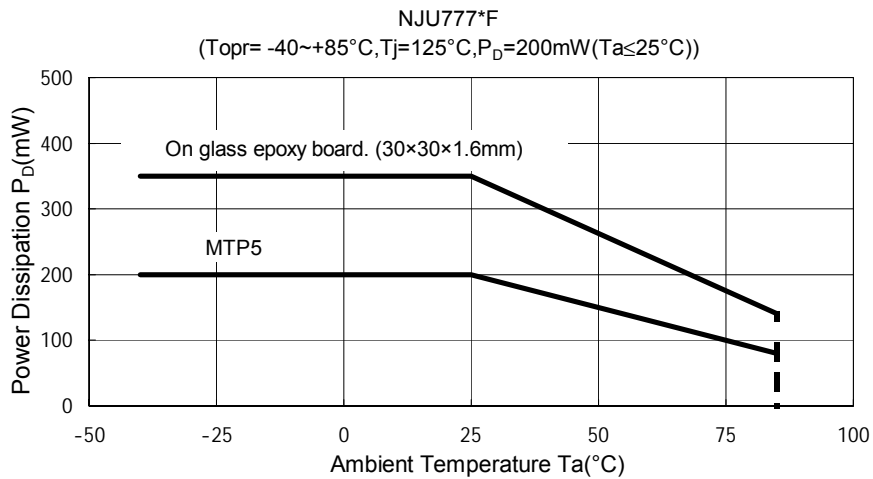
(\*note 4): The above specification is a common specification for all output voltages.

Therefore, it may be different from the individual specification for a specific output voltage.

## ■ TEST CIRCUIT



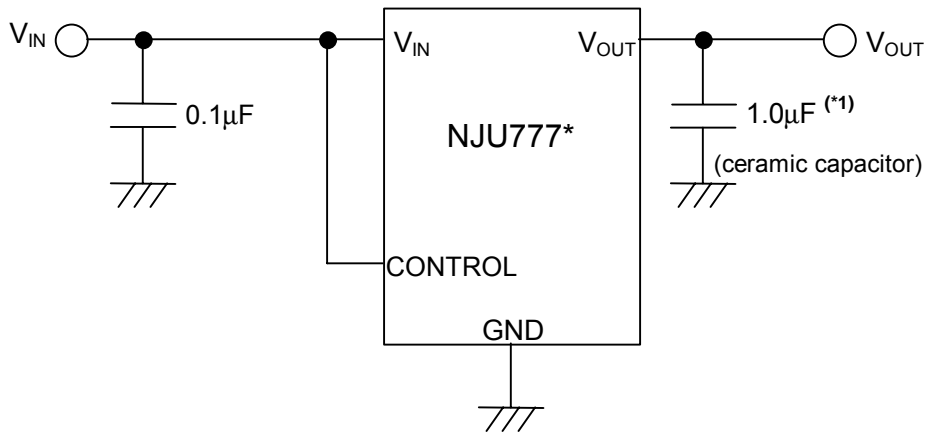
## ■ POWER DISSIPATION vs. AMBIENT TEMPERATURE



# NJU7771/72/73/74/75/76

## ■ TYPICAL APPLICATION

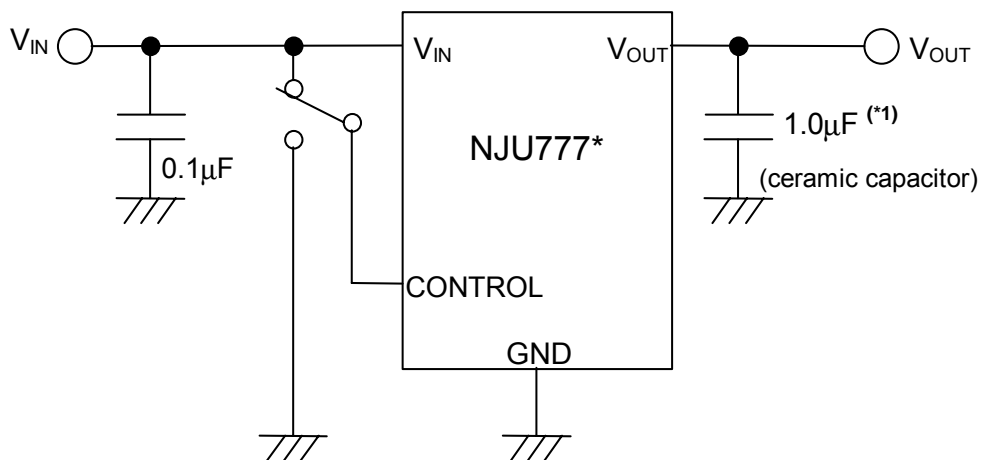
① In case that ON/OFF Control is not required:



(\*1)  $V_o \leq 2.0\text{V}$  version:  $C_o = 2.2\mu\text{F}$  (ceramic)

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

② In use of ON/OFF Control

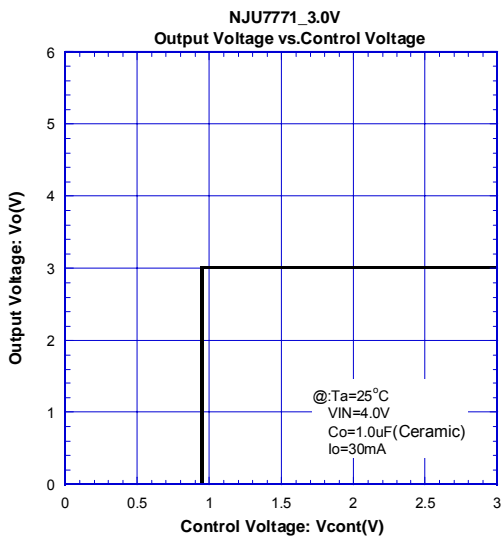
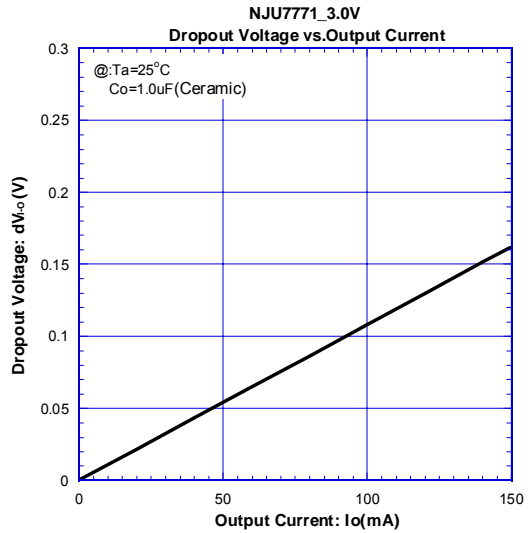
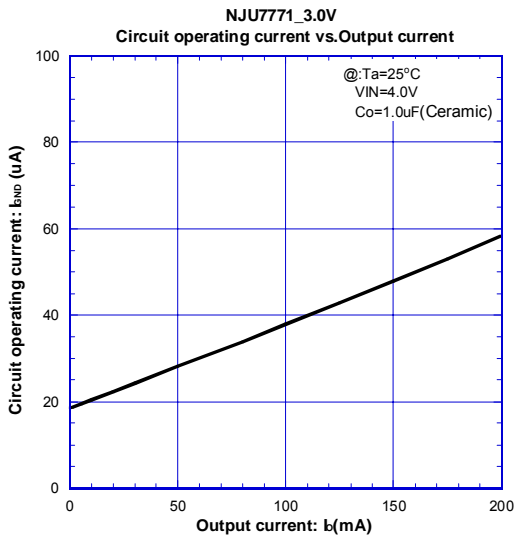
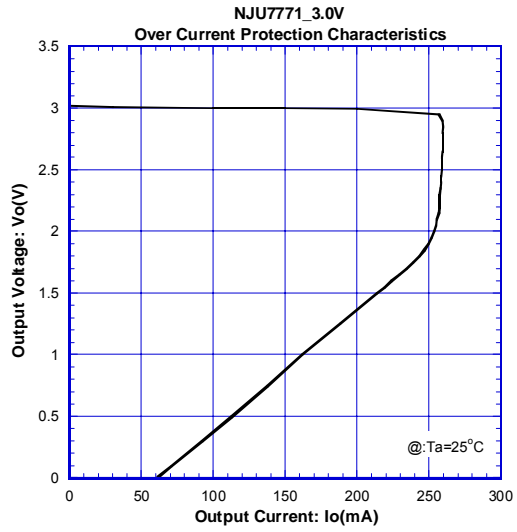
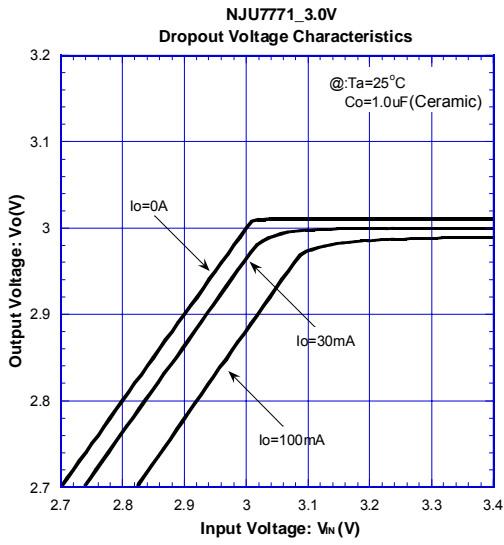


(\*1)  $V_o \leq 2.0\text{V}$  version:  $C_o = 2.2\mu\text{F}$  (ceramic)

State of control terminal:

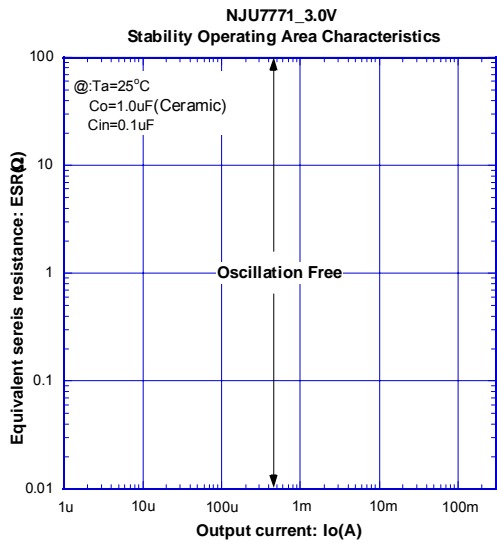
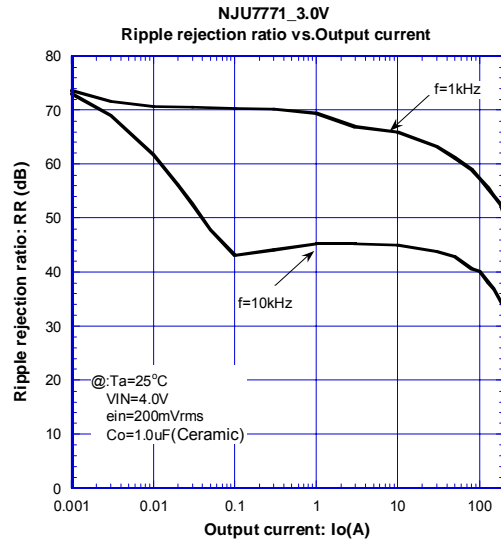
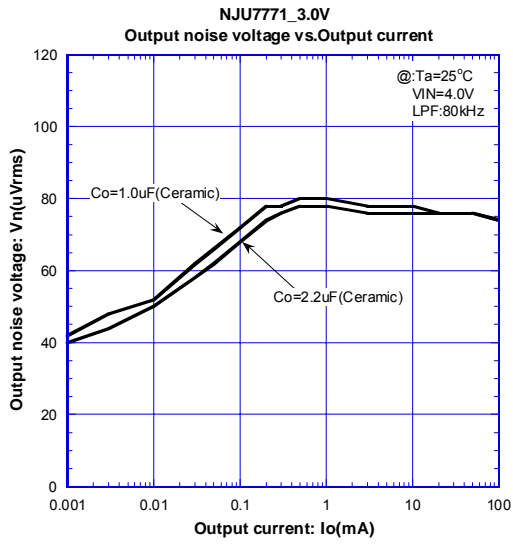
- "H" → output is enabled.
- "L" or "open" → output is disabled.

## ELECTRICAL CHARACTERISTICS

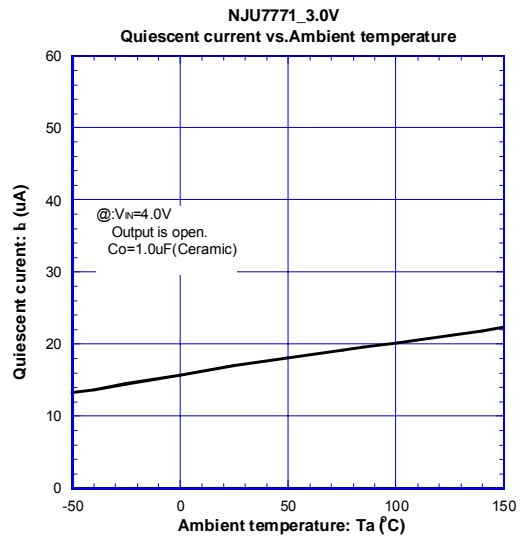
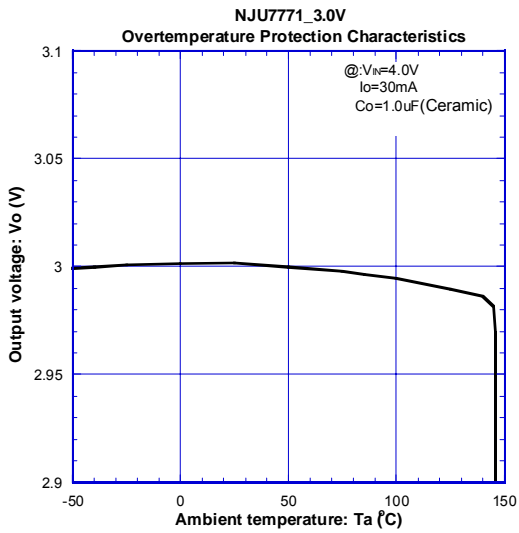
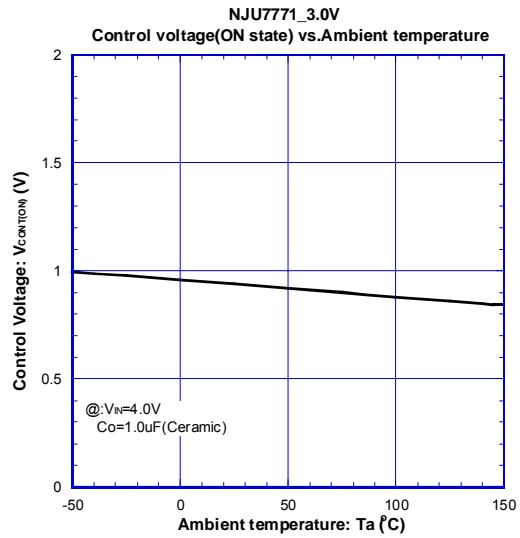
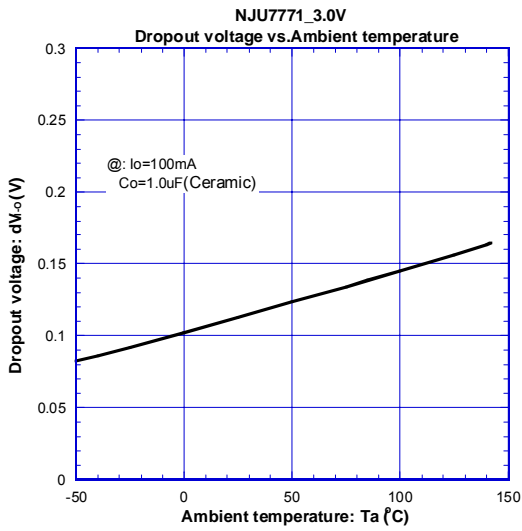


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## ■ ELECTRICAL CHARACTERISTICS



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[CAUTION]

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