

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.

■ PACKAGE OUTLINE

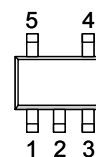


NJU777*F

■ FEATURES

- High Ripple Rejection 65dB typ. (f=1kHz, V_o=3.0V version)
- Low quiescent Current I_q=18μA (I_o=0mA)
- Output capacitor with 1.0μF ceramic capacitor (V_o≤2.0V version)
- Output Current I_o(max.)=150mA
- High Precision Output V_o±1.0%
- Low Dropout Voltage 0.15V typ. (I_o=100mA, V_o=3.0V)
- Input Voltage Range V_{IN}=+2.3V~14V (V_o≤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)

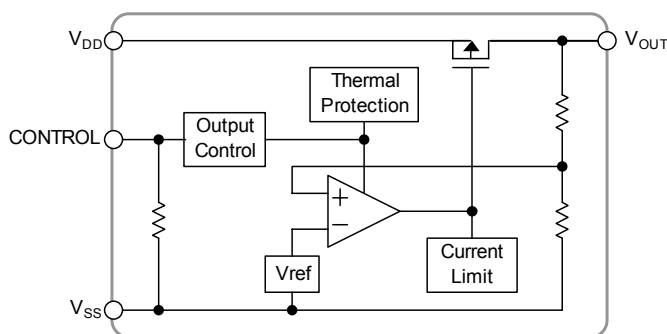
■ PIN CONFIGURATION



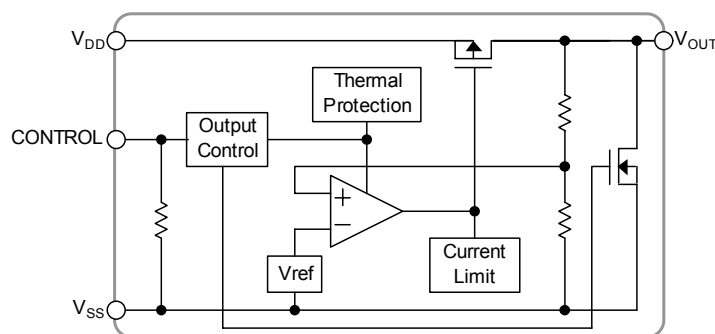
PIN FUNCTION

1.CONTROL	1.V _{IN}	1.V _{OUT}
2.GND	2.GND	2.GND
3.NC	3.CONTROL	3.V _{IN}
4.V _{OUT}	4.NC	4.CONTROL
5.V _{IN}	5.V _{OUT}	5.NC
NJU7771F	NJU7772F	NJU7773F
NJU7774F	NJU7775F	NJU7776F

■ EQUIVALENT CIRCUIT



NJM7771/72/73



NJM7774/75/76

■ OUTPUT VOLTAGE RANK LIST

Device Name	V _{OUT}	Device Name	V _{OUT}	Device Name	V _{OUT}
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_{IN}	+10	V
Control Voltage	V_{CONT}	+10(*note 1)	V
Power Dissipation	P_D	200	mW
Operating Temperature	T_{opr}	-40 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +125	°C
OFF-state Output Sink Current(*note2)	I_O	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

($V_{IN}=V_O+1V$, $C_{IN}=0.1\mu F$, $C_O=1.0\mu F$ ($C_O=2.2\mu F$: $V_O\leq 2.0V$), $T_a=25^\circ C$)

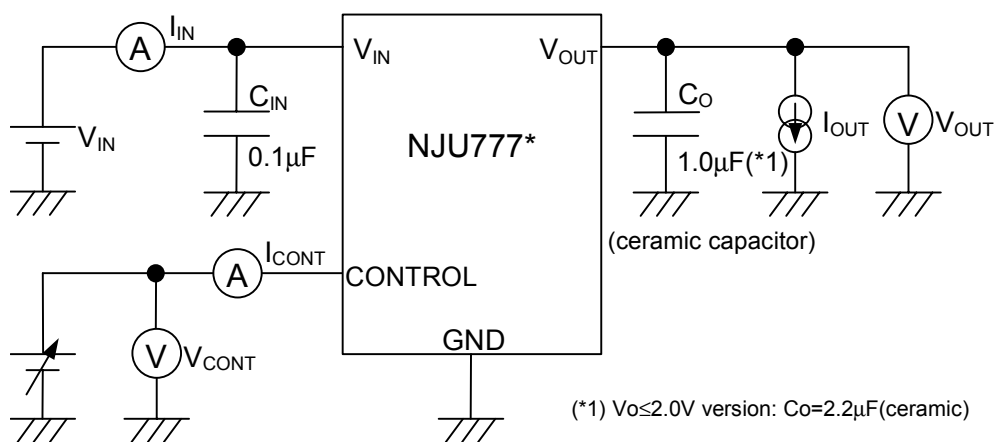
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	$I_O=30mA$	-1.0%	—	+1.0%	V
Input Voltage	V_{IN}		2	V_O+1V	9	V
Quiescent Current	I_Q	$I_O=0mA$, $V_{CONT}=V_{IN}$	—	18	35	μA
Quiescent Current at Control OFF	$I_{Q(OFF)}$	$V_{CONT}=0V$	—	0.1	1	μA
Output Current	I_O	$V_O=0.1V$ ($V_O\leq 2.0V$) $V_O=0.3V$ ($V_O\geq 2.1V$)	150	—	—	mA
Short Current Limit	I_{LIM}	$V_O=0V$	30	50	110	mA
Line Regulation	$\Delta V_O/\Delta V_{IN}$	$V_{IN}=V_O+1V \sim V_O+6.0V$ ($V_O<3.0V$) $V_{IN}=V_O+1V \sim 9.0V$ ($V_O\geq 3.0V$), $I_O=30mA$	—	—	0.20	%/V
Load Regulation	$\Delta V_O/\Delta I_O$	$I_O=0 \sim 100mA$	—	—	0.03	%/mA
Dropout Voltage(*note 3)	ΔV_{I-O}	$I_O=100mA$, $2.1V\leq V_O\leq 2.4V$	—	0.2	0.3	V
		$I_O=100mA$, $2.5V\leq V_O\leq 2.7V$	—	0.18	0.28	V
		$I_O=100mA$, $2.8V\leq V_O\leq 3.3V$	—	0.15	0.25	V
		$I_O=100mA$, $3.4V\leq V_O\leq 5.0V$	—	0.12	0.22	V
Ripple Rejection	RR	$e_{in}=200mV_{rms}$, $f=1kHz$, $I_O=10mA$, $V_O=3.0V$ Version	—	65	—	dB
Average Temperature Coefficient of Output Voltage	$\Delta V_O/\Delta T_a$	$T_a=0 \sim 85^\circ C$, $I_O=10mA$	—	± 100	—	ppm/°C
Output Noise Voltage	V_{NO1}	$f=10Hz \sim 80kHz$, $I_O=0mA$, $V_O=3.0V$ Version	—	40	—	μV_{rms}
	V_{NO2}	$f=10Hz \sim 80kHz$, $I_O=10mA$, $V_O=3.0V$ Version	—	70	—	μV_{rms}
Pull-down Resistance	R_{CONT}		2.5	5	10	$M\Omega$
Control Voltage for ON-state	$V_{CONT(ON)}$		1.6	—	—	V
Control Voltage for OFF-state	$V_{CONT(OFF)}$		0	—	0.3	V

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

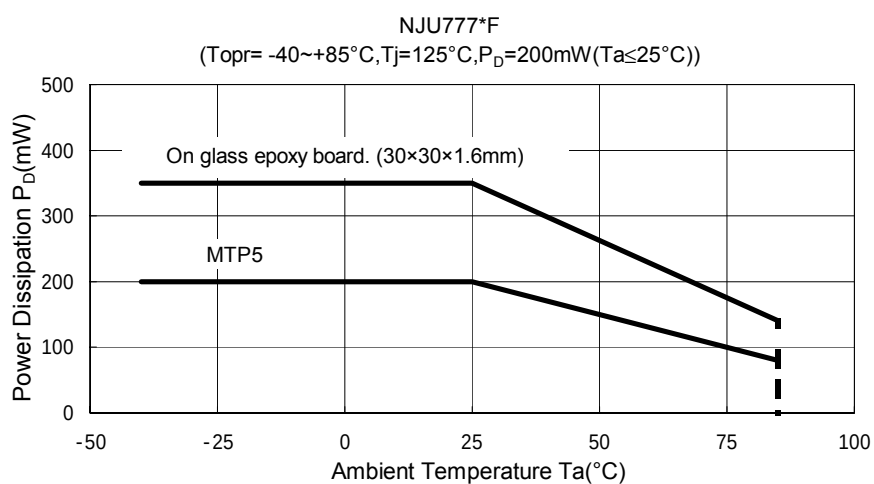
(*note 4): The above specification is a common specification for all output voltages.

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

■ TEST CIRCUIT



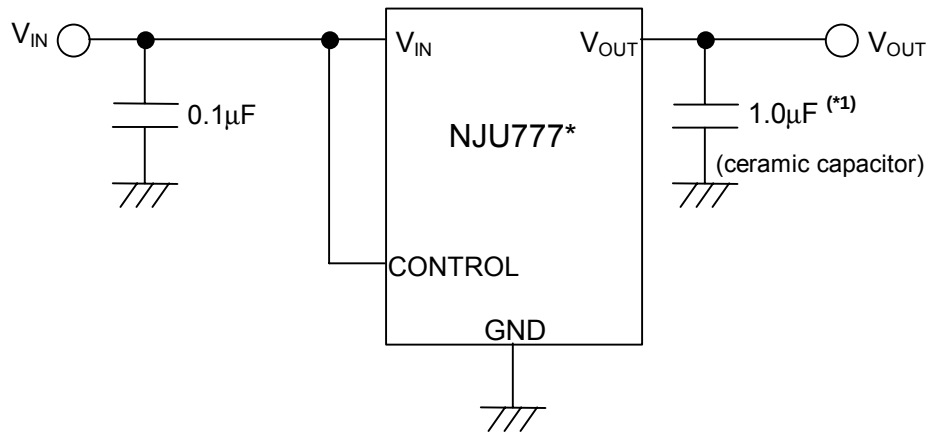
■ POWER DISSIPATION vs. AMBIENT TEMPERATURE



NJU7771/72/73/74/75/76

■ TYPICAL APPLICATION

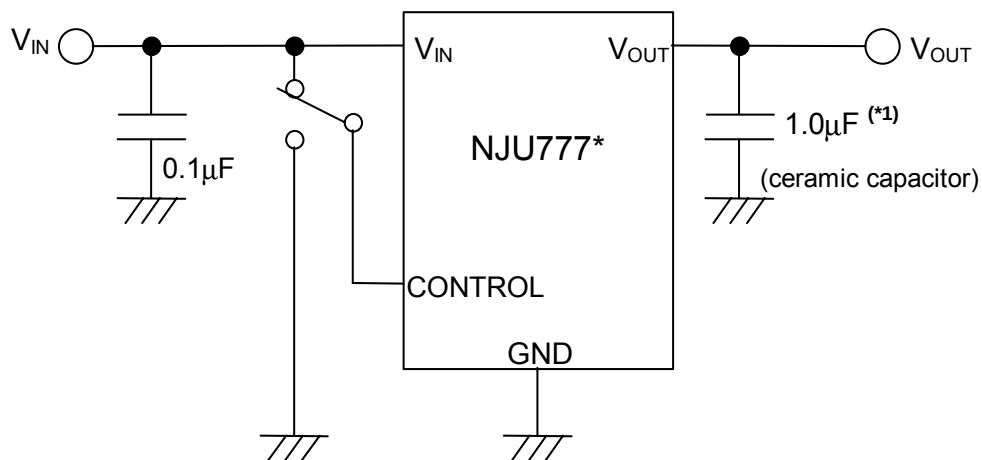
① In case that ON/OFF Control is not required:



(*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

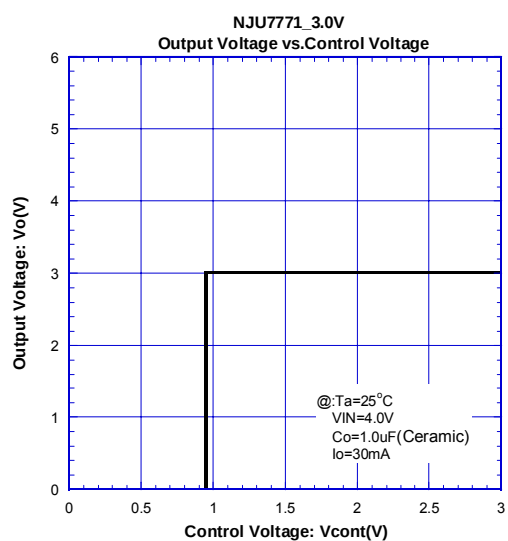
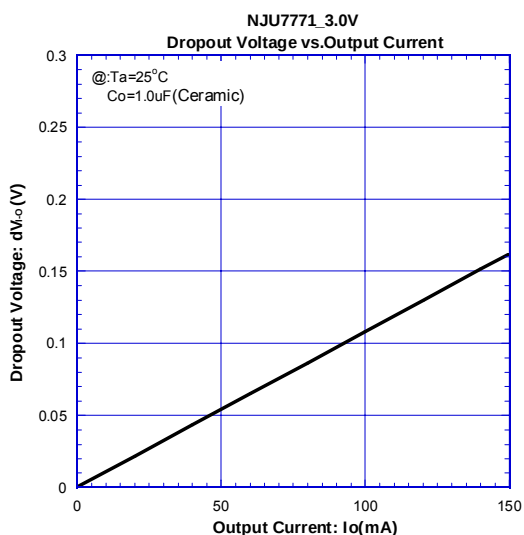
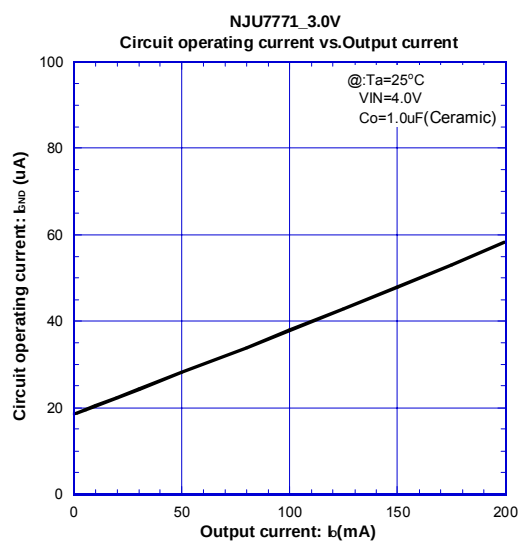
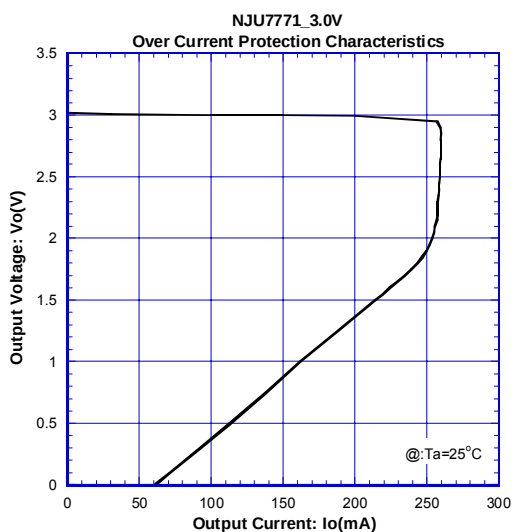
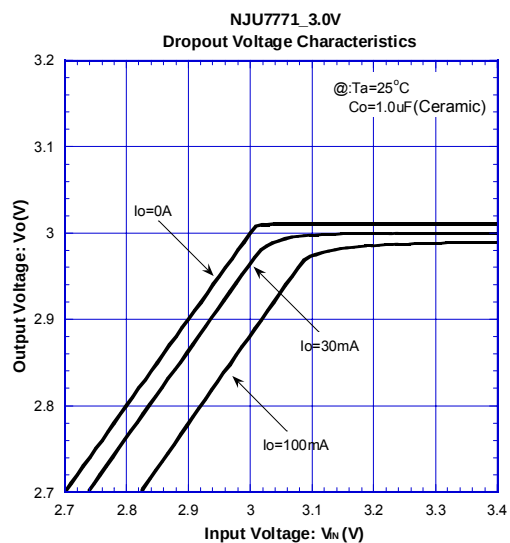


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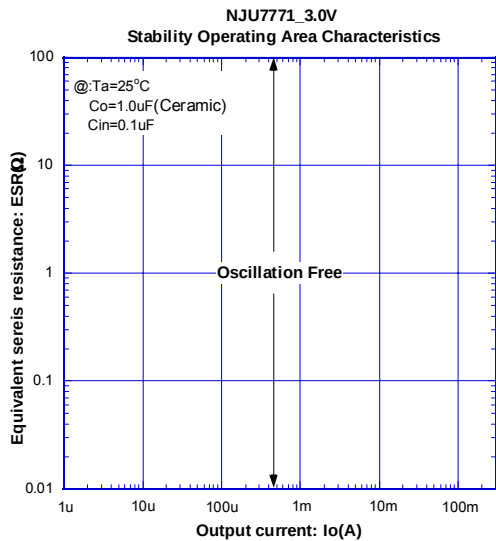
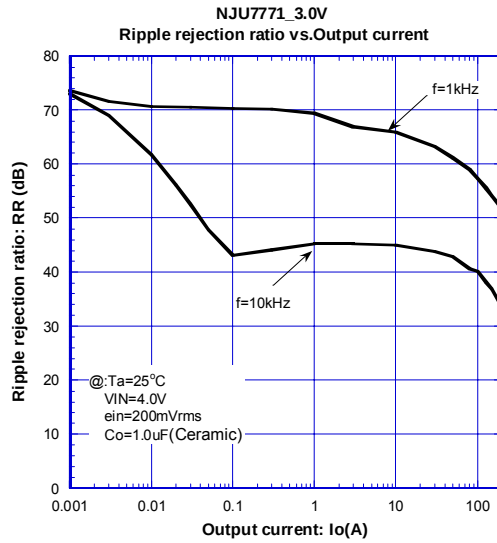
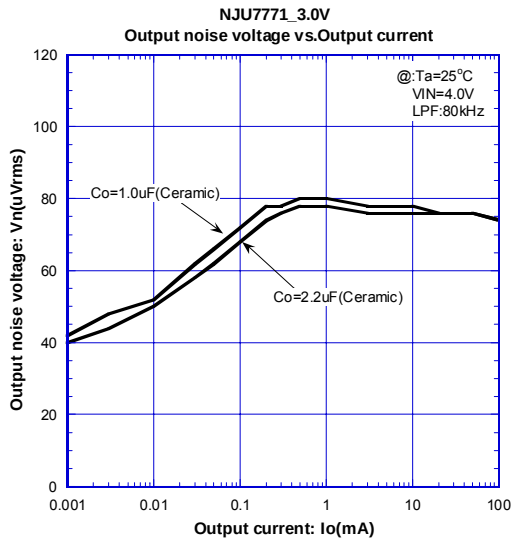
State of control terminal:

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

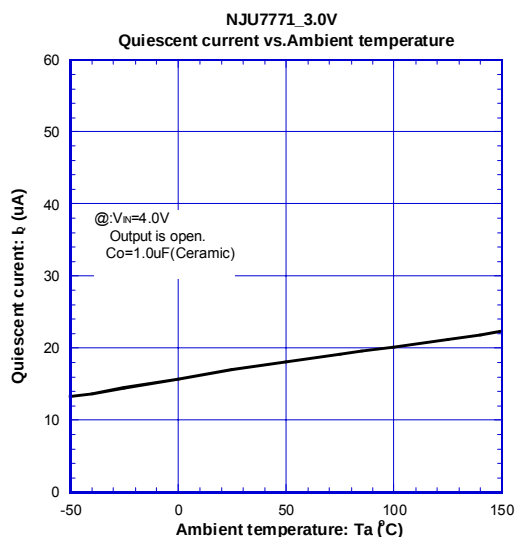
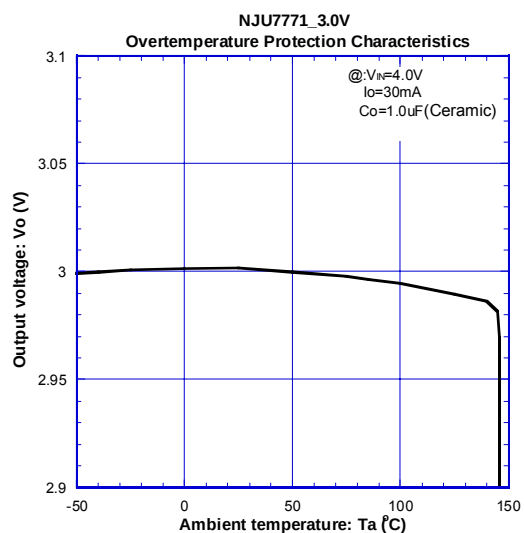
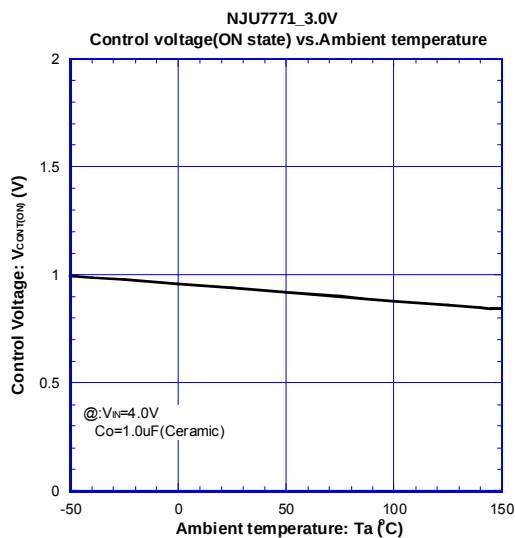
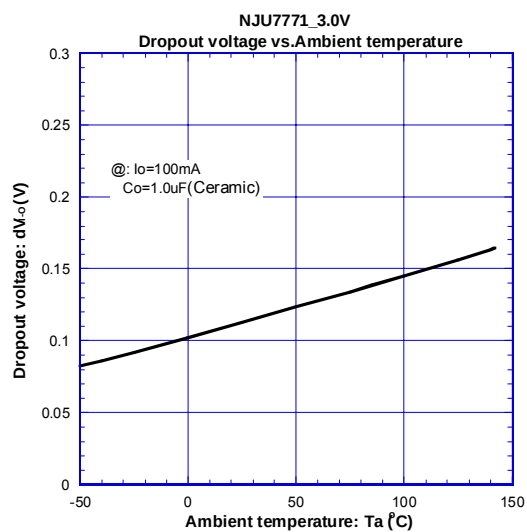
ELECTRICAL CHARACTERISTICS



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ELECTRICAL CHARACTERISTICS



[CAUTION]

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