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## NTE1809 Integrated Circuit VCR Capstan, DD, Motor Driver

**Description:**

The NTE1809 is an integrated circuit designed for a VCR capstan direct-drive motor drive.

**Features:**

- Three-phase full-wave operation
- Built-in output transistors
- Built-in torque ripple canceller circuit
- Max. output current ( $I_{Omax}$ ): 1.5A
- Max. operation voltage of motor ( $V_{Mmax}$ ): 24V
- Supply voltage: 5V

**Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Supply Voltage, $V_{CC}$ .....	6V
Motor Supply Voltage, $V_{M(24)}$ .....	24V
Motor Drive Current, $I_1, I_3, I_{23}$ .....	$\pm 1.5\text{A}$
Output Terminal Voltage, $V_1, V_3, V_{23}$ .....	24V
Power Dissipation, $P_D$ .....	2000mW
Operating Ambient Temperature Range, $T_{opr}$ .....	-20 to +70°C

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Current	$I_{CC}$	$V_{CC} = 5\text{V}$	-	-	15	mA
Torque Reference Voltage	ECR	$V_{CC} = 5\text{V}$	2.3	-	3	V
Torque Command Voltage	EC	$V_{CC} = 5\text{V}, \text{ECR} = 25\text{V}$	1	-	4	V
Torque Command Voltage Offset	$EC_{offset}$	$V_{CC} = 5\text{V}, \text{ECR} = 25\text{V}$	-150	-	+150	mV
Torque Command Voltage Dead Zone	$EC_{dead}$	$V_{CC} = 5\text{V}, \text{ECR} = 25\text{V}$	60	-	150	mV
Output Idle Voltage	$EC_{idle}$	$V_{CC} = 5\text{V}$				
Input/Output Gain	$G_{io}$	$V_{CC} = 5\text{V}, \text{ECR} = 25\text{V}$	0.51	-	0.65	times
Forward Command Voltage	$E_{D-F}$	$V_{CC} = 5\text{V}, \text{ECR} = 25\text{V}$	-	-	0.9	V
STOP Command Voltage	$E_{D-S}$	$V_{CC} = 5\text{V}, \text{ECR} = 25\text{V}$	1.3	-	3	V
Reverse Command Voltage	$E_{D-R}$	$V_{CC} = 5\text{V}, \text{ECR} = 25\text{V}$	3.5	-	-	V
Hall Element Supply Voltage	$V_{H+}$	$V_{CC} = 5\text{V}, I_H = 20\text{mA}$	2.6	-	3.2	V



**Electrical Characteristics (Cont'd):** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Hall Element Input Allowable	$V_{H(IN)}$	$V_{CC} = 5V, I_H = 20mA$	1.2	-	2.35	V
Hall Element Offset Referred to Input	$V_{H(offset)}$	$V_{CC} = 5V, I_H = 20mA$	-5	-	5	mV
Upper Saturation Voltage	$V_{P(sat)}$	$I_A = 1A$	-1.2	-	-	V
Lower Saturation Voltage	$V_{N(sat)}$	$I_A = 1A$	-	-	1.8	V
Torque Limit-Current Sense Offset	TL-CS (offset)	$V_{TL} = 700mV$	15	-	40	mV
Ripple Cancel Output	$V_{RCC}$	$V_{CC} = 5V$	50	-	-	mV
Ripple Cancel ON Voltage	$V_{RCC-ON}$	$V_{CC} = 5V$	-	-	0.9	V
Direction Detection Output Voltage	$V_{ER}$	$V_{CC} = 5V$	-	-	0.5	V

Note Range of the operating supply voltage:  $V_{CC(opr)} = 4.5V$  to  $5.5V$

**Pin Connection Diagram**  
(Front View)



