

8-BIT μ P-COMPATIBLE D/A CONVERTER

SE/NE5019

ABSOLUTE MAXIMUM RATINGS

PARAMETER	RATING	UNIT
V_{CC+} Positive supply voltage	18	V
V_{CC-} Negative supply voltage	-18	V
V_{IN} Logic input voltage	0 to 18	V
V_{REFIN} Voltage at V_{REF} input	12	V
V_{REFADJ} Voltage at V_{REF} adjust	0 to V_{REF}	V
V_{SUM} Voltage at sum node	12	V
I_{REFSC} Short-circuit current to ground at V_{REF} OUT	Continuous	
I_{OUTSC} Short-circuit current to ground or either supply at V_{OUT}	Continuous	
P_D Power dissipation*		
-N package	800	mW
-F package	1000	mW
T_A Operating temperature range		
SE5019	-55 to +125	°C
NE5019	0 to +70	°C
T_{STG} Storage temperature range	-65 to +150	°C
T_{SOLD} Lead soldering temperature (10 seconds)	300	°C

*NOTES

For N package, derate at 120°C/W above 35°C

For F package, derate at 75°C/W above 75°C

DC ELECTRICAL CHARACTERISTICS $V_{CC+} = +15V$, $V_{CC-} = -15V$, SE5019, $-55^{\circ}C \leq T_A \leq 125^{\circ}C$,
 NE5019, $0^{\circ}C \leq T_A \leq 70^{\circ}C$ unless otherwise specified.¹
 Typical values are specified at 25°C

PARAMETER	TEST CONDITIONS	SE5019			NE5019			UNIT
		Min	Typ	Max	Min	Typ	Max	
Resolution		8	8	8	8	8	8	Bits
Monotonicity		8	8	8	8	8	8	Bits
Relative accuracy				± 0.1			± 0.1	%FS
V_{CC+} Positive supply voltage		11.4	15		11.4	15		V
V_{CC-} Negative supply voltage		-11.4	-15		-11.4	-15		V
$V_{IN(1)}$ Logic "1" input voltage	$V_{IN(1)} = 0V$	2.0			2.0			V
$V_{IN(0)}$ Logic "0" input voltage	$V_{IN(0)} = 0V$			0.8			0.8	V
$I_{IN(1)}$ Logic "1" input current	$V_{IN(1)} = 0V$, $2V < V_{IN} < 18V$		0.1	10		0.1	10	μA
$I_{IN(0)}$ Logic "0" input current	$V_{IN(0)} = 0V$, $-5V < V_{IN} < 0.8V$		-2.0	-10		-2.0	-10	μA
V_{FS} Full scale output voltage	Unipolar operation $V_{REF IN} = 5.000V$, $T_A = 25^{\circ}C$	9.50	9.961	10.50	9.50	9.961	10.50	V
V_{FS} Full scale output voltage	Bipolar operation $V_{REF IN} = 5.000V$, $T_A = 25^{\circ}C$	4.5	+4.961	5.5	4.5	+4.961	5.5	V
V_{ZS} Zero scale voltage		-5.040	-5.000	-4.960	-5.040	-5.000	-4.960	mV
		-30	5	+30	-30	5	+30	
I_{OS} Output short circuit current	$T_A = 25^{\circ}C$ $V_{OUT} = 0V$		15	40		15	40	mA
$PSR^{+}(out)$ Output power supply rejection (+)	$V^- = -15V$, $13.5V \leq V^+ \leq 16.5V$, external $V_{REF IN} = 5.000V$		.001	.01		.001	.01	%FS/ %VS
$PSR^{-}(out)$ Output power supply rejection (-)	$V^+ = 15V$, $-13.5V \leq V^- \leq -16.5V$, external $V_{REF IN} = 5.000V$		.001	.01		.001	.01	%FS/ %VS
TC_{FS} Full scale temperature coefficient	$V_{REF IN} = 5.000V$		20			20		ppm/°C
TC_{ZS} Zero scale temperature coefficient			5			5		ppm/°C

NOTE

1. Refer to Figure 2.

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DC ELECTRICAL CHARACTERISTICS (Cont'd) $V_{CC+} = +16V$, $V_{CC-} = -15V$, SE5019. $-55^{\circ}C \leq T_A \leq 125^{\circ}C$,
NE5019. $0^{\circ}C \leq T_A \leq 70^{\circ}C$ unless otherwise specified.¹
Typical values are specified at $25^{\circ}C$

PARAMETER	TEST CONDITIONS	SE5019			NE5019			UNIT
		Min	Typ	Max	Min	Typ	Max	
I_{REF}	Reference output current	Note 8 $T_A = 25^{\circ}C$ $V_{REF OUT} = 0V$						mA
I_{REFSC}	Reference short circuit current					15	30	
$PSR+_{REF}$	Reference power supply rejection (+)	$V- = -15V$, $13.5V \leq V+ \leq 16.5V$, $I_{REF} = 1.0mA$				.003	.01	%VR / %VS
$PSR-_{REF}$	Reference power supply rejection (-)	$V+ = 15V$, $-13.5V \leq V- \leq 16.5V$, $I_{REF} = 1.0mA$				.003	.01	%VR / %VS
V_{REF}	Reference voltage	$I_{REF} = 1.0mA$			4.9	5.0	5.25	V
TC_{REF}	Reference voltage temperature coefficient	$I_{REF} = 1.0mA$, $T_A = 25^{\circ}C$				60		
Z_{IN}	DAC V_{REFIN} input impedance	$I_{REF} = 1.0mA$, $T_A = 25^{\circ}C$			4.15	5.0	5.85	K Ω
I_{CC+}	Positive supply current	$V_{CC+} = 15V$				7	14	mA
I_{CC-}	Negative supply current	$V_{CC-} = -15V$				-10	-15	
P_D	Power dissipation	$I_{REF} = 1.0mA$, $V_{CC} = \pm 15V$			255	435		mW

NOTE

1. Refer to Figure 2.

AC ELECTRICAL CHARACTERISTICS² $V_{CC} = \pm 15V$, $T_A = 25^{\circ}C$

PARAMETER	TO	FROM	TEST CONDITIONS	SE/NE5019			UNIT
				Min	Typ	Max	
T_{SLH}	Settling time	$\pm \frac{1}{2}$ LSB	Input	All bits low to high ³ All bits high to low ⁴			μs
T_{SHL}	Settling time	$\pm \frac{1}{2}$ LSB	Input				
t_{plh}	Propagation delay	Output	Input	All bits switched low to high ³ All bits switched high to low ⁴			ns
t_{phl}	Propagation delay	Output	Input				
t_{plsb}	Propagation delay	Output	Input	1 LSB change ^{3,4} low to high transition ⁵ high to low transition ⁶			ns
t_{plh}	Propagation delay	Output	$\overline{LE}$				
t_{phl}	Propagation delay	Output	$\overline{LE}$				
t_s	Set-up time	$\overline{LE}$	Input	2, 7	100		ns
t_h	Hold time	Input	$\overline{LE}$	2, 7	50		ns
t_{pw}	Latch enable pulse width			2, 7	150		ns

NOTES

2. Refer to Figure 3.

3. See Figure 6.

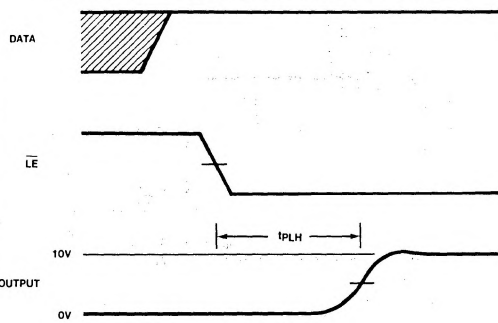
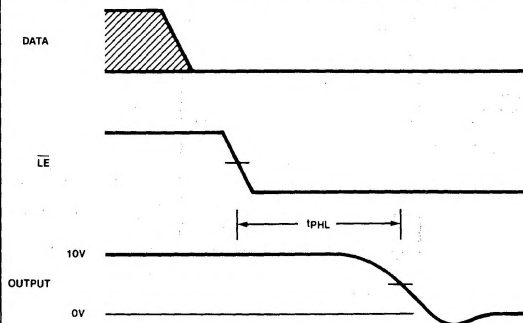
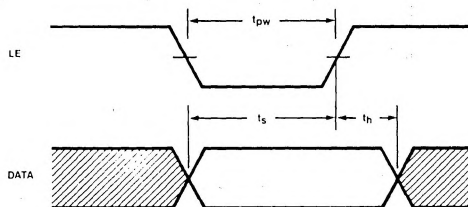
4. See Figure 7.

5. See Figure 8.

6. See Figure 9.

7. See Figure 10.

8. For reference currents $> 3mA$, use of an external buffer is required.

8-BIT μ P-COMPATIBLE D/A CONVERTER**SE/NE5019****PROPAGATION DELAY, LATCH ENABLE TO OUTPUT****Figure 8****PROPAGATION DELAY, LATCH ENABLE TO OUTPUT****Figure 9****LATCH ENABLE PULSE WIDTH, SET-UP AND HOLD TIMES****Figure 10**