

## Specifications

### Absolute Maximum Ratings Over Operating Free-Air Temperature Range (Unless Otherwise Noted)

Supply voltage range, $V_{CC}$ (see Note 1)	-0.6 V to 7 V
Input voltage range (except OSCC), $V_I$	-0.6 V to $V_{CC} + 0.5$ V
Input voltage range, OSCC, $V_I$	-0.6 V to 15 V
Output voltage range, OUT, $V_O$	-0.6 V to 15 V
Operating free-air temperature range, $T_A$	-25°C to 85°C
Storage temperature range, $T_{stg}$	-65°C to 150°C

NOTE 1: Voltage values are with respect to GND.

### Recommended Operating Conditions

	MIN	MAX	UNIT
Supply voltage, $V_{CC}$	3	6	V
High-level input voltage, $V_{IH}$	$V_{CC}-0.5$	$V_{CC}$	V
Low-level input voltage, $V_{IL}$	0	0.5	V
Operating free-air temperature, $T_A$	-25	85	°C

### Electrical Characteristics Over Recommended Operating Free-Air Temperature Range

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$V_{OL}$ Low-level output voltage, OUT	$I_{OL} < 5$ mA	$V_{CC}-0.5$		$V_{SS}+0.5$	V
$V_{OH}$ High-level output voltage, OUT	$I_{OL} < 5$ mA	$V_{CC}-0.5$			V
$I_I$ Input current, IN	$V_I = 0$ V to 6 V			$\pm 10$	$\mu$ A
$I_O$ Output current, OUT	$V_O = 0$ V to 12 V			$\pm 10$	$\mu$ A
$C_i$ Input capacitance			10		pF
$C_o$ Output capacitance			5		pF

### Amplifier Electrical Characteristics Over Full Range of Operating Conditions

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$V_{I(PP)}$ Peak-to-peak input voltage		3			mV
$V_{N(PP)}$ External peak-to-peak noise voltage				1	mV
$V_O$ Output voltage, TIME		$V_{OL}$		$V_{OH}$	V
B Bandwidth	$V_I = 3$ mV			15	kHz
	$V_I = 100$ mV <sub>PP</sub>			500	
	$V_I = 200$ mV <sub>PP</sub>			1000	
G Flatband gain	CEX (nF) > 900/ $f_{osc}$ (kHz)		200		
	CEX not connected		1		

### Receiver Current Consumption Over Full Range of Operating Conditions

	MIN	MAX	UNIT
$I_{CC}$ Supply current, analog		2	mA
$I_{CC}$ Supply current, logic		200	$\mu$ A

## Transmitter Current Consumption Over Full Range of Operating Conditions

	MIN	MAX	UNIT
I <sub>CC</sub> Supply current, standby		13	μA
I <sub>CC</sub> Supply current, code transmission		260	μA

## Programming Current Consumption Over Full Range of Operating Conditions

	MIN	MAX	UNIT
I <sub>OSCC</sub> Programming current, OSCC		100	μA

## Oscillator Characteristics Over Full Range of Operating Conditions (see Note 2)

	MIN	TYP	MAX	UNIT
f <sub>RX</sub> Receiver frequency	10		500	kHz
f <sub>TX</sub> Transmitter frequency	f <sub>RX</sub> /10	f <sub>RX</sub> /10	f <sub>RX</sub> /5.5	kHz
Frequency spread (temperature, V <sub>CC</sub> )			± 20%	

NOTE 2: Typical values are recommended whenever possible.

## Power-On Reset

	MAX	UNIT
V <sub>CC</sub> (V <sub>CC</sub> to have power-on reset)	2.7	V
Power-on reset duration	40	ms

## Write/Erase Endurance

	MIN	TYP	MAX	UNIT
Number of program cycles	20	10000		

## Abort/Retry

Time between consecutive codes	46 x t <sub>w</sub> (transmitter)
Time out for high-level bit to abort the code	3 x t <sub>w</sub> (receiver)
Time out for low-level bit to abort the code	25 x t <sub>w</sub> (receiver)
Time between aborted code and reading of new code	3 x t <sub>w</sub> (receiver)

## Switching Characteristics

### Normal Transmission – Internal Clock (see Figure 3–1)

	MIN	TYP	MAX	UNIT
t <sub>w</sub> Pulse duration, half-oscillating period	5	1/(2 x f <sub>osc</sub> )	100	μs
t <sub>w1</sub> Pulse duration, logic 1 bit	5	t <sub>w</sub>	100	μs
t <sub>w0</sub> Pulse duration, logic 0 bit	35	7 x t <sub>w</sub>	700	μs
V <sub>OH</sub> High-level output voltage, OSCC	1.2		1.6	V
V <sub>OL</sub> Low-level output voltage, OSCC	0.6		0.7	V

## Switching Characteristics (continued)

### Normal Transmission – External Clock (see Figure 3–2)

	MIN	TYP	MAX	UNIT
$t_{p0} + t_{p1}$ Oscillating period	10	$1/(f_{osc})$	200	$\mu s$
$t_{w1}$ Pulse duration, logic 1 bit	5	$t_{p1}$	100	$\mu s$
$t_{w2}$ Pulse duration, logic 0 bit	35	$3 \times t_{p0} + 4 \times t_{p1}$	700	$\mu s$
$V_{IH}$ High-level input voltage, OSCC	$V_{CC} - 0.5$			V
$V_{IL}$ Low-level input voltage, OSCC	$V_{SS} + 0.5$			V

### Modulated Transmission – Internal Clock (see Figure 3–3)

	MIN	TYP	MAX	UNIT
$f_{osc(t)}$ Transmitter oscillating period	100	110	120	kHz
$f_{osc(r)}$ Receiver oscillator frequency	400	440	480	kHz
$t_{w(H)}$ High-level modulated pulse duration	9	$1/f_{osc(t)}$	10	$\mu s$
$t_c$ Cycle time	27	$3 \times t_{w(H)}$	30	$\mu s$
$t_{wT}$ Total pulse duration	135	$5 \times t_c$	150	$\mu s$
$t_{w1}$ Pulse duration, logic 1 bit	135	$t_{wT}$	150	$\mu s$
$t_{w2}$ Pulse duration, logic 0 bit	945	$7 \times t_{wT}$	1050	$\mu s$

### VTR Generation (see Figure 3–4)

	MIN	TYP	MAX	UNIT
$t_{su}$ Setup time transmitted/receiver external clock on OSCC $\downarrow$ and before OUT $\uparrow$	152	$19 \times t_{wT}$ (receiver)		$\mu s$
$t_{w3}$ Pulse duration, OUT	48	$6 \times t_{wT}$ (receiver)	$R_{TIME} \times C_{TIME}$ (see Note 3)	$\mu s$

NOTE 3:  $R_{TIME}$  is the value of the pullup resistor on TIME and  $C_{TIME}$  is the value of the capacitor in parallel with  $R_{TIME}$ .  $C_{TIME}$  should not exceed 1  $\mu F$ .