

OKI Semiconductor

1A

MSM27C201CZ

262,144-Word x 8-Bit One Time PROM

DESCRIPTION

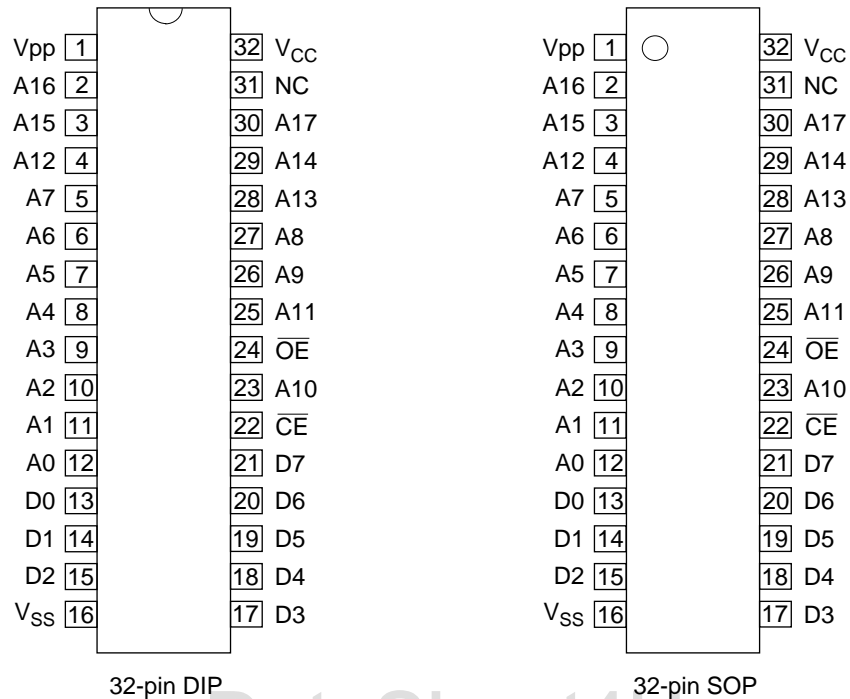
The MSM27C201CZ is a 2Mbit electrically Programmable Read-Only Memory organized as 262,144 word x 8bit. The MSM27C201CZ operates on a single +5V power supply and is TTL compatible. Since the MSM27C201CZ operates asynchronously, external clocks are not required, making this device easy-to-use. The MSM27C201CZ is suitable as large-capacity fixed memory for microcomputers and data terminals. It is manufactured using a CMOS double silicon gate technology and is offered in 32-pin DIP, 32-pin SOP or 32-pin TSOP packages.

FEATURES

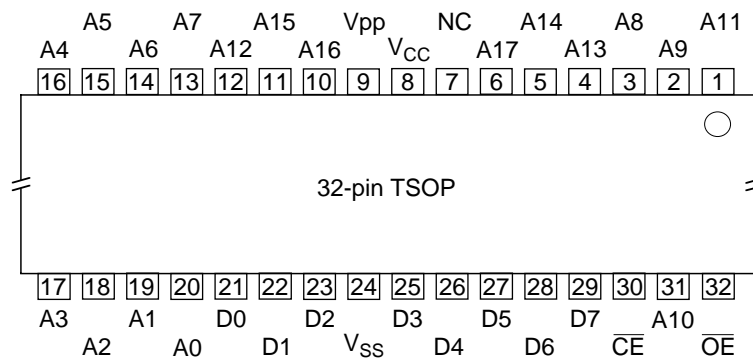
- 262,144 word x 8bit
- Single +5V power supply
- Access time 80ns
- Input / Output TTL compatible
- Three-state output
- Packages
 - 32-pin plastic DIP (DIP32-P-600-2.54)
 - 32-pin plastic SOP (SOP32-P-525-1.27-K)
 - 32-pin plastic TSOP (TSOP I 32-P-814-0.50-K)

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PIN CONFIGURATION (TOP VIEW)

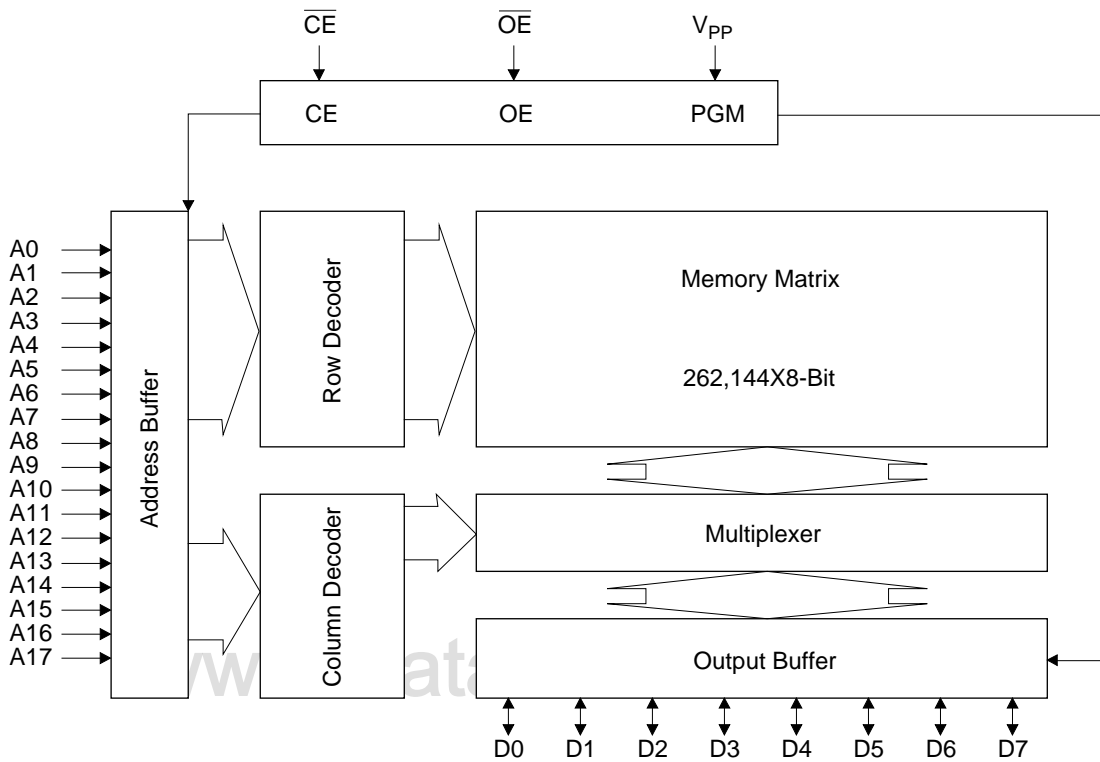


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PIN NAMES	FUNCTIONS
A0 - A17	Address input
D0 - D7	Data output
CE	Chip enable
OE	Output enable
V _{CC}	Power supply voltage
V _{SS}	GND
V _{PP}	Program Power supply voltage
NC	No Connection

BLOCK DIAGRAM



FUNCTION TABLE

MODE	\overline{CE}	\overline{OE}	V_{PP}	V_{CC}	D0 - D7
READ	L	L	**	5.0V	D_{OUT}
OUTPUT DISABLE	L	H			Hi-Z
STAND-BY	H	*			Hi-Z
PROGRAM	L	H	11.5V	6.25V	D_{IN}
PROGRAM INHIBIT	H	H			Hi-Z
PROGRAM VERIFY	H	L			D_{OUT}

* : Don't Care (H or L)

** : Don't Care (H or L or Open)

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Condition	Value	Unit
Operating temperature under bias	T_{opr}	-	0 to 70	°C
Storage temperature	T_{stg}		-55 to 125	°C
Input voltage	V_I	relative to V_{SS}	-0.5 to $V_{CC} + 0.5$	V
Output voltage	V_O		-0.5 to $V_{CC} + 0.5$	V
Power supply voltage	V_{CC}		-0.5 to 7	V
Program power supply voltage	V_{PP}		-0.5 to 12.5	V
Power dissipation per package	P_D	-	1.0	W

RECOMMENDED OPERATING CONDITIONS FOR READ

(Ta=0 to 70°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
V_{CC} power supply voltage	V_{CC}	$V_{CC}=4.75V - 5.25V$	4.75	-	5.25	V
V_{PP} power supply voltage	V_{PP}		-0.5	-	$V_{CC}+0.5$	V
Input "H" level	V_{IH}		2.2	-	$V_{CC}+0.5$	V
Input "L" level	V_{IL}		-0.5	-	0.6	V

Voltage is relative to V_{SS}

ELECTRICAL CHARACTERISTICS (Read operation)

DC Characteristics

($V_{CC}=5V\pm 0.25V$, $T_a=0$ to 70°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input leakage current	I_{LI}	$V_I=0$ to V_{CC}	-	-	10	μA
Output leakage current	I_{LO}	$V_O=0$ to V_{CC}	-	-	10	μA
V_{CC} power supply current (Standby)	I_{CS1}	$\overline{CE}=V_{CC}$	-	-	50	μA
	I_{CS2}	$\overline{CE}=V_{IH}$	-	-	1	mA
V_{CC} power supply current (Read)	I_{CCA}	$\overline{CE}=V_{IL}$, $\overline{OE}=V_{IH}$ $t_c=80\text{ns}$	-	-	35	mA
V_{PP} power supply current	I_{PP}	$V_{PP}=V_{CC}$	-	-	10	μA
Input "H" level	V_{IH}	-	2.2	-	$V_{CC}+0.5$	V
Input "L" level	V_{IL}	-	-0.5	-	0.8	V
Output "H" level	V_{OH}	$I_{OH}=-400\mu\text{A}$	2.4	-	-	V
Output "L" level	V_{OL}	$I_{OL}=2.1\text{mA}$	-	-	0.45	V

Voltage is relative to V_{SS}

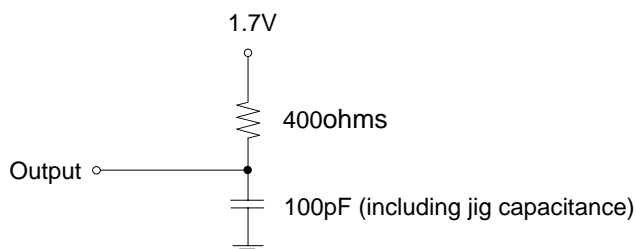
AC Characteristics

($V_{CC}=5V\pm 0.25V$, $T_a=0$ to 70°C)

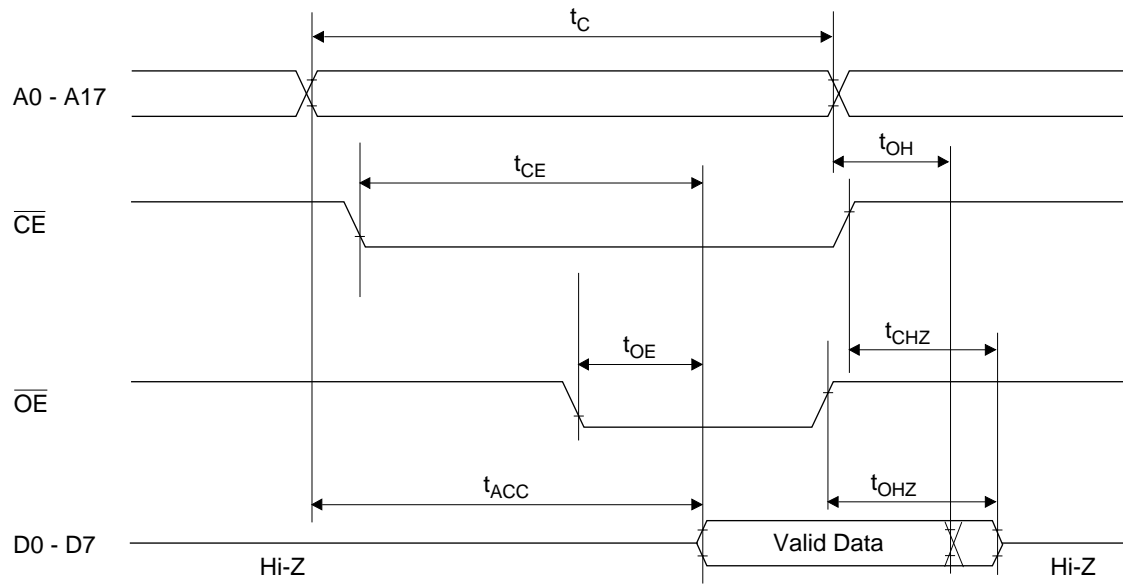
Parameter	Symbol	Condition	Min.	Max.	Unit
Access cycle time	T_C	-	80	-	ns
Address access time	T_{ACC}	$\overline{CE}=\overline{OE}=V_{IL}$	-	80	ns
\overline{CE} access time	T_{CE}	$\overline{OE}=V_{IL}$	-	80	ns
\overline{OE} access time	T_{OE}	$\overline{CE}=V_{IL}$	-	50	ns
Output disable time	T_{CHZ}	$\overline{OE}=V_{IL}$	0	40	ns
	T_{OHZ}	$\overline{CE}=V_{IL}$	0	35	ns
Output hold time	T_{OH}	$\overline{CE}=\overline{OE}=V_{IL}$	0	-	ns

Measurement conditions

Input signal level	-----	0V/3V
Input timing reference level	-----	0.8V/2.0V
Output load	-----	1TTL gate + 100pF
Output timing reference level	-----	0.8V/2.0V



TIMING CHART (READ CYCLE)



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ELECTRICAL CHARACTERISTICS (Programming operation)**DC Characteristics**

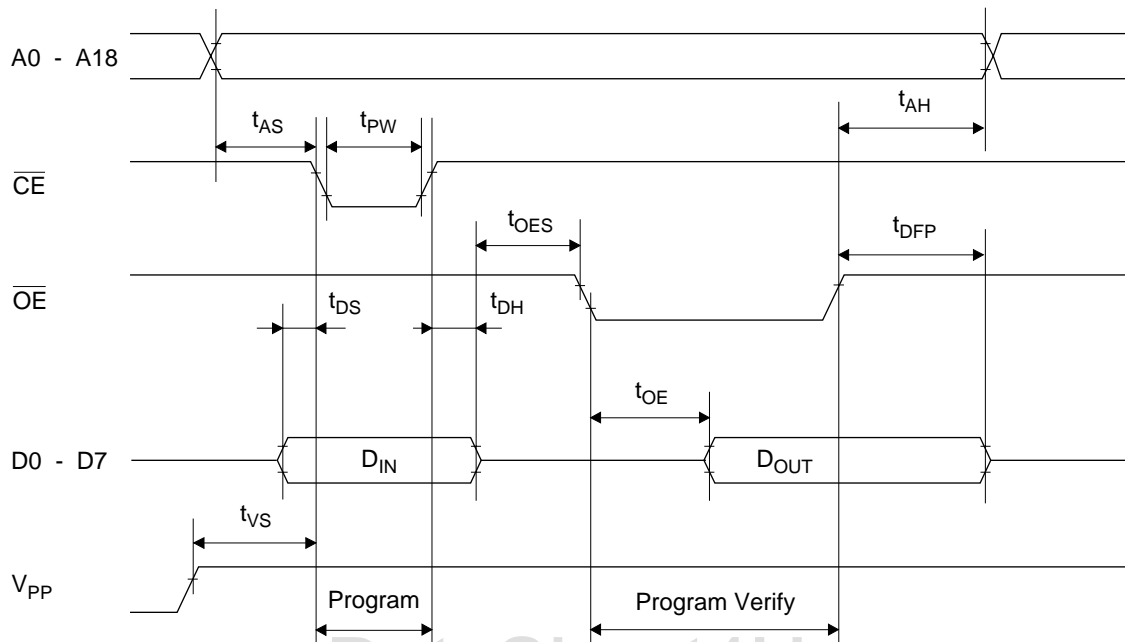
(Ta=25°C±5°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input leakage current	I _{LI}	V _I =V _{CC} +0.5V	-	-	10	μA
V _{PP} power supply current (Program)	I _{PP2}	$\overline{CE}=V_{IL}$	-	-	50	mA
V _{CC} power supply current	I _{CC}	-	-	-	80	mA
Input "H" level	V _{IH}	-	2.2	-	V _{CC} +0.5	V
Input "L" level	V _{IL}	-	-0.5	-	0.8	V
Output "H" level	V _{OH}	I _{OH} =-400μA	2.4	-	-	V
Output "L" level	V _{OL}	I _{OL} =2.1mA	-	-	0.45	V
Program voltage	V _{PP}	-	11.25	11.5	11.75	V
V _{CC} power supply voltage	V _{CC}	-	6.0	6.25	6.5	V

Voltage is relative to V_{SS}**AC Characteristics**(V_{CC}=6.25V±0.25V, V_{pp}=11.5V±0.25V, Ta=25°C±5°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Address set-up time	T _{AS}	-	2	-	-	μs
\overline{OE} set-up time	T _{OES}	-	2	-	-	μs
Data set-up time	T _{DS}	-	2	-	-	μs
Address hold time	T _{AH}	-	0	-	-	μs
Data hold time	T _{DH}	-	2	-	-	μs
Output float delay from \overline{OE}	T _{DFP}	-	0	-	130	ns
V _{PP} voltage set-up time	T _{VS}	-	2	-	-	μs
Program pulse width	T _{PW}	-	23	25	27	μs
Data valid from \overline{OE}	T _{OE}	-	-	-	150	ns

Programming Waveform

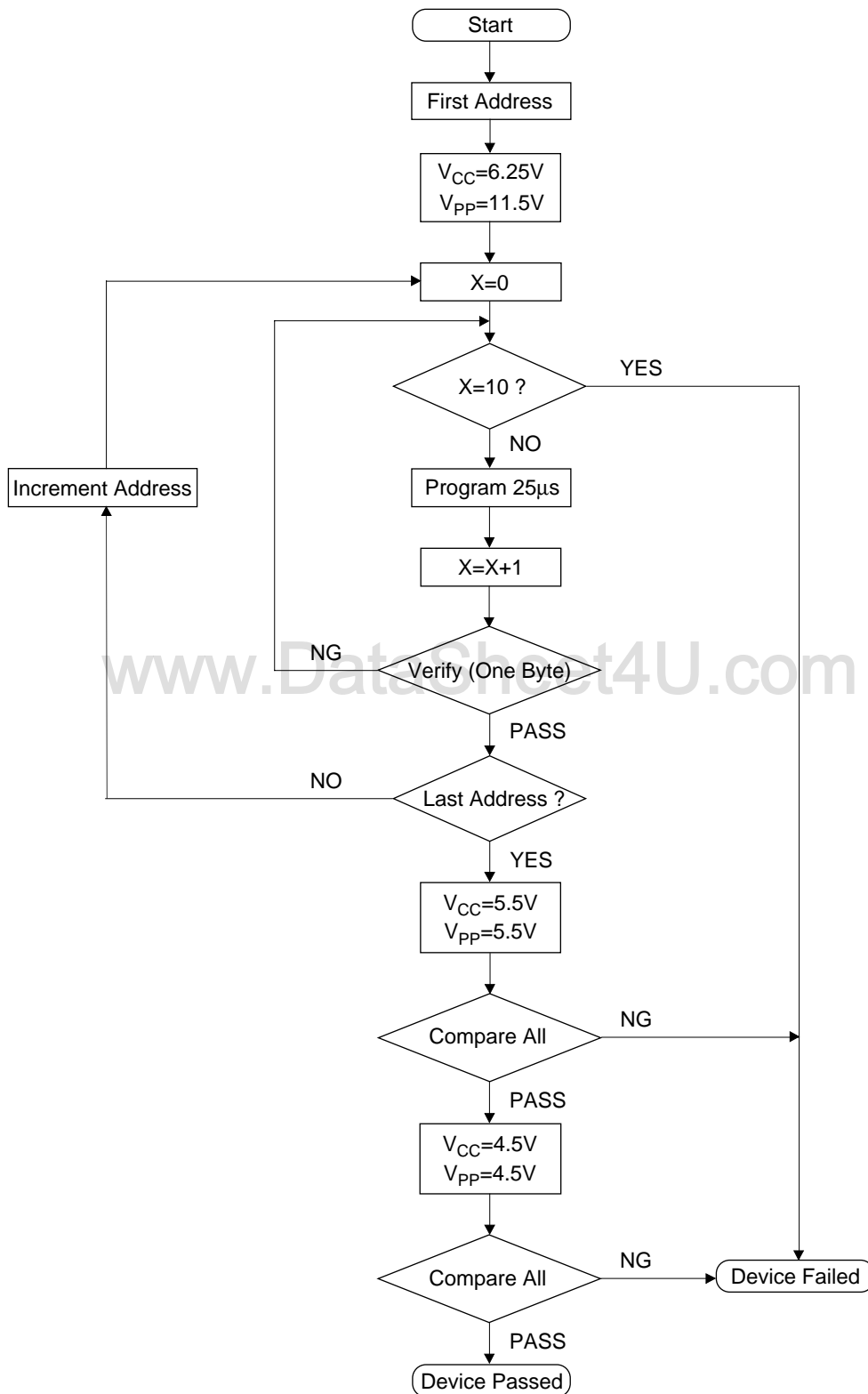


PIN Capacitance

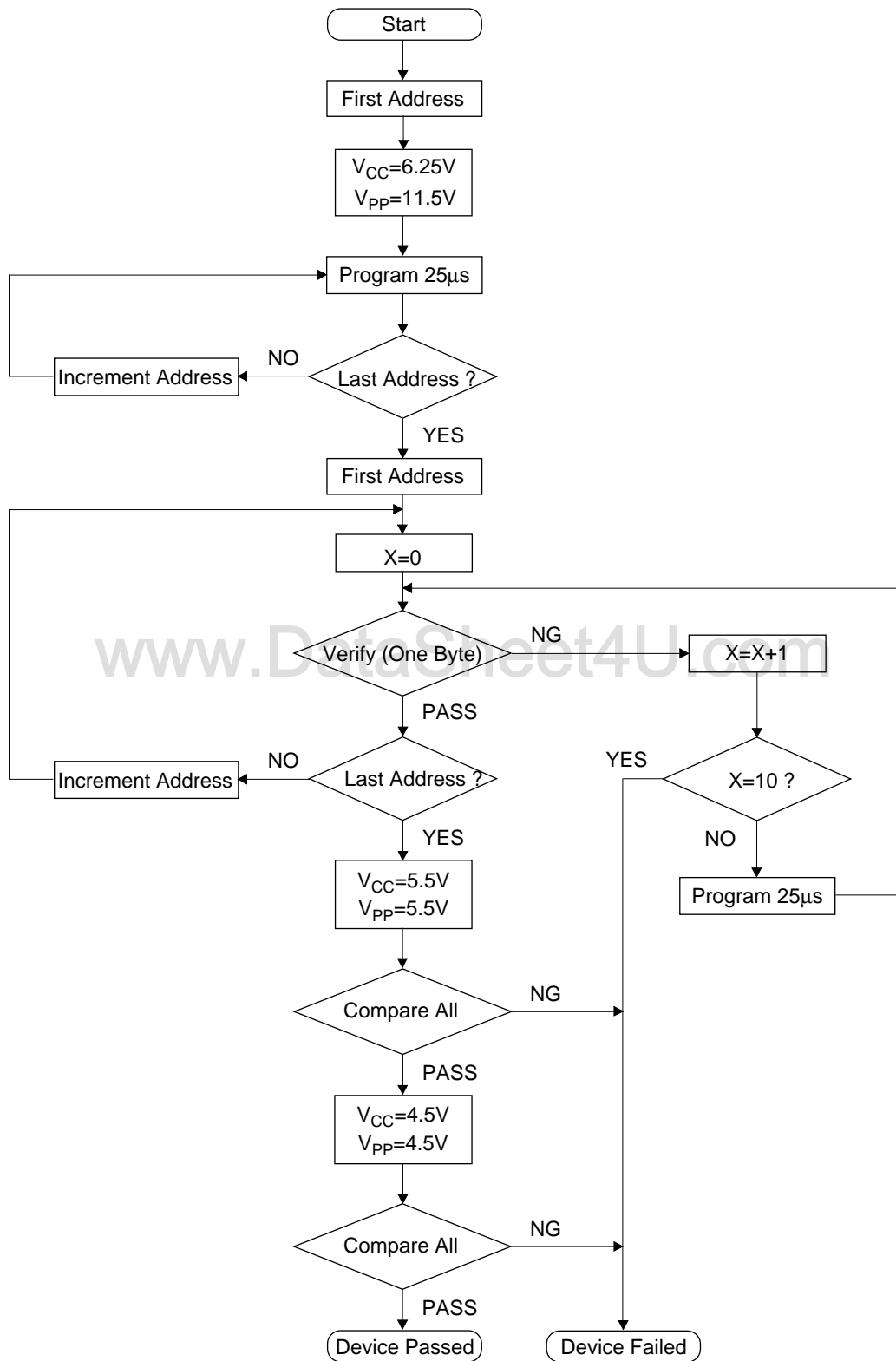
($V_{CC}=5V$, $T_a=25^\circ C$, $f=1MHz$)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input	C_{IN}	$V_I=0V$	-	-	12	pF
Output	C_{OUT}	$V_O=0V$	-	-	15	

High Speed Programming Algorithm (I)



High Speed Programming Algorithm (II)



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