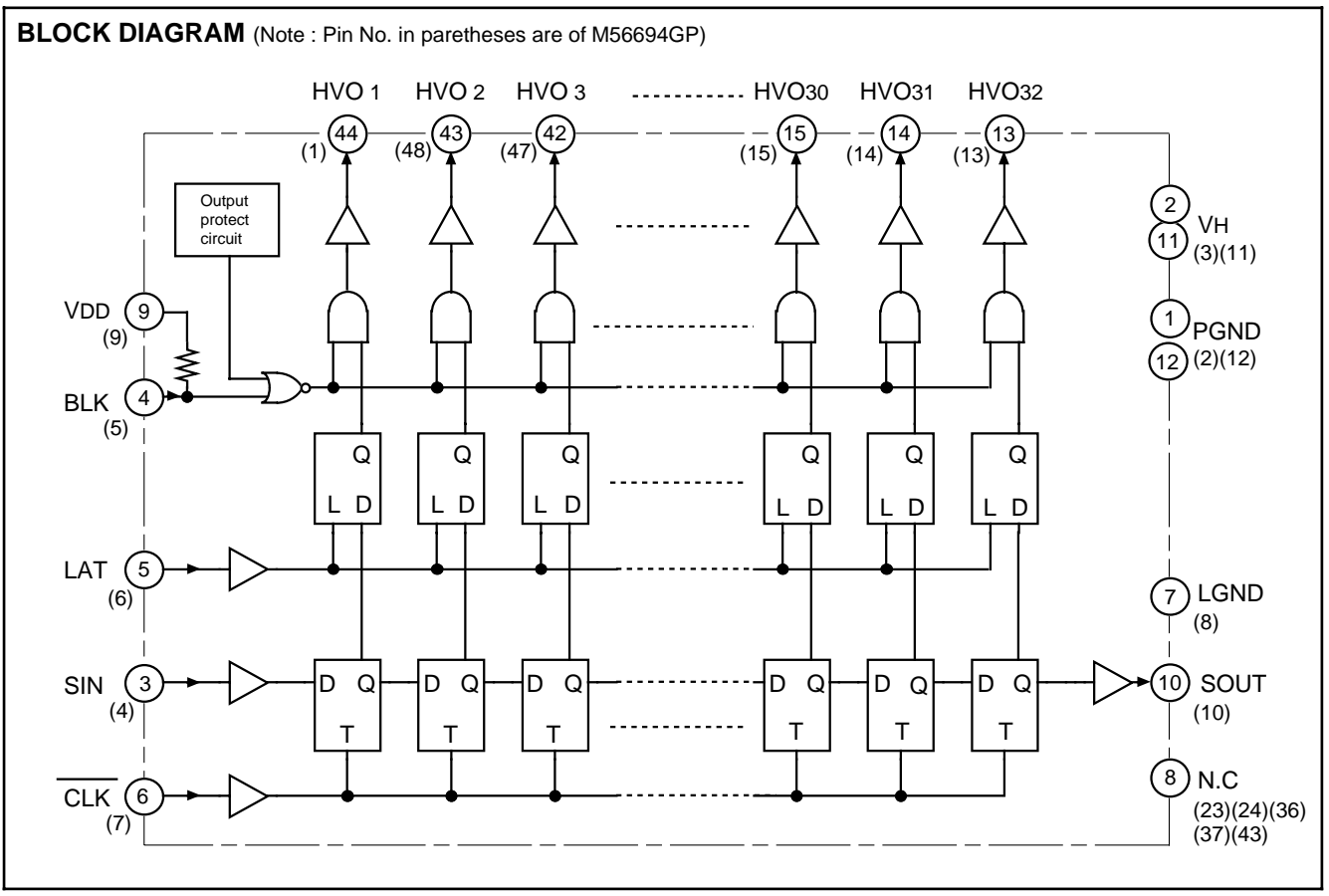


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Bi-CMOS & DMOS 32BIT SERIAL-INPUT LATCHED DRIVER



TRUTH TABLE

Truth table 1. Shift register section

$\overline{\text{CLK}}$	Shift register operation
↓	DATA is shifted.
H or L	No changes.

Truth table 2. Latch and driver sections

Dn	LAT	BLK	HVOn
X	X	H	Output all "L"
H	H	L	H
L	H	L	L
X	L	L	Latch's data output.

Dn=nth bit DFF retention data
 HVOn=nth bit driver output
 L="L" level
 H="H" level
 X="L" level or "H" level

PIN FUNCTION DESCRIPTION

Pin name	Function
V _{DD}	Logic stage supply voltage
LGND	Logic stage ground
V _H	Output stage supply voltage
PGND	Output stage ground
$\overline{\text{CLK}}$	Clock input for the internal shift register. The data enter the internal shift registers and the data in the shift registers will be shifted in order by High to Low change of the clock.
SIN	Serial data input
SOUT	Serial data output
LAT	Latch input. When the LATCH is set to "H", the data in the shift register will enter the each latch circuit. When the LATCH input is set to "L", the data will be held.
BLK	Enable input for output control. When the BLK input is set to "L", data in the latch circuit will appear at outputs. When the BLK input is set to "H", all outputs will be set to "L".
HVO1 – 32	Output driver (push-pull)

ABSOLUTE MAXIMUM RATINGS (T_a=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V _{DD}	Logic stage supply voltage		-0.3 – 7	V
V _H	Output stage supply voltage		-0.3 – 120	V
V _I	Logic inputs voltage		-0.3 – V _{DD} +0.3	V
V _O	Logic outputs voltage	Data output	-0.3 – V _{DD} +0.3	V
V _{HVO}	Output voltage	High supply voltage output pin	-0.3 – V _H	V
P _d	Power dissipation range	T _a ≤ 25°C	940	mW
T _{stg}	Storage temperature range		-55 – 150	°C

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Conditions	Ratings	Unit
V _{DD}	Supply voltage		4.5 – 5.5	V
V _H	Supply voltage		10 – 110	V
T _{opr}	Operating temperature		-20 – 75	°C

ELECTRICAL CHARACTERISTICS (V_{DD}=5V, V_H=110V and T_a=25°C, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I _{DD}	Supply current 1	No load		1	2	mA
I _H	Supply current 2	Output all "L", no load		0	50	μA
		Output all "H", no load		2	4	mA
I _{IH}	"H" input current	V _{IH} =5V		0	2	μA
I _{IL}	"L" input current	V _{IL} = 0V		0	-2	μA
			SIN, LAT, $\overline{\text{CLK}}$ BLK		-20	-100
V _{HVOH}	Driver output voltage	I _{HVOH} = -0.5mA	100	106		V
V _{HVOL}		I _{HVOL} = 0.5mA		0.7	2	
V _{OH}	Logic output voltage	I _{OH} = -0.1mA	4.5	4.95		V
V _{OL}		I _{OL} = +0.1mA		0.04	0.4	
I _{HVOH}	"H" output current	High supply voltage output pin		-1	-3	mA
I _{HVOL}	"L" output current	High supply voltage output pin		1	3	mA
V _{TH}	Output protect operating voltage			3.4		V
V _{TL}					3.1	

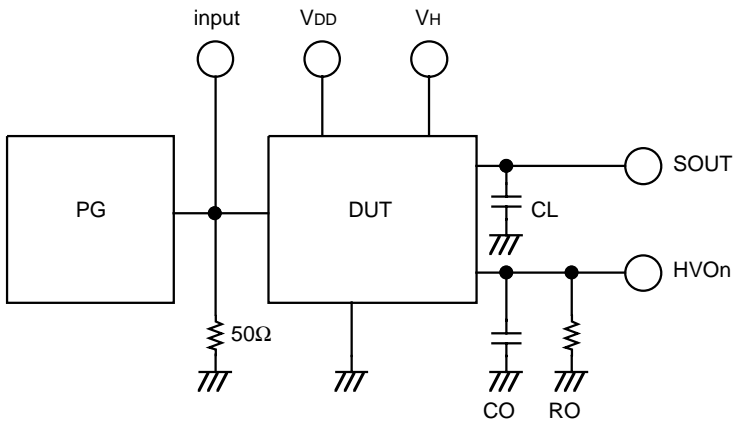
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SWITCHING CHARACTERISTICS (V_{DD}=5V, V_H=110V and T_a=25°C, unless otherwise noted)

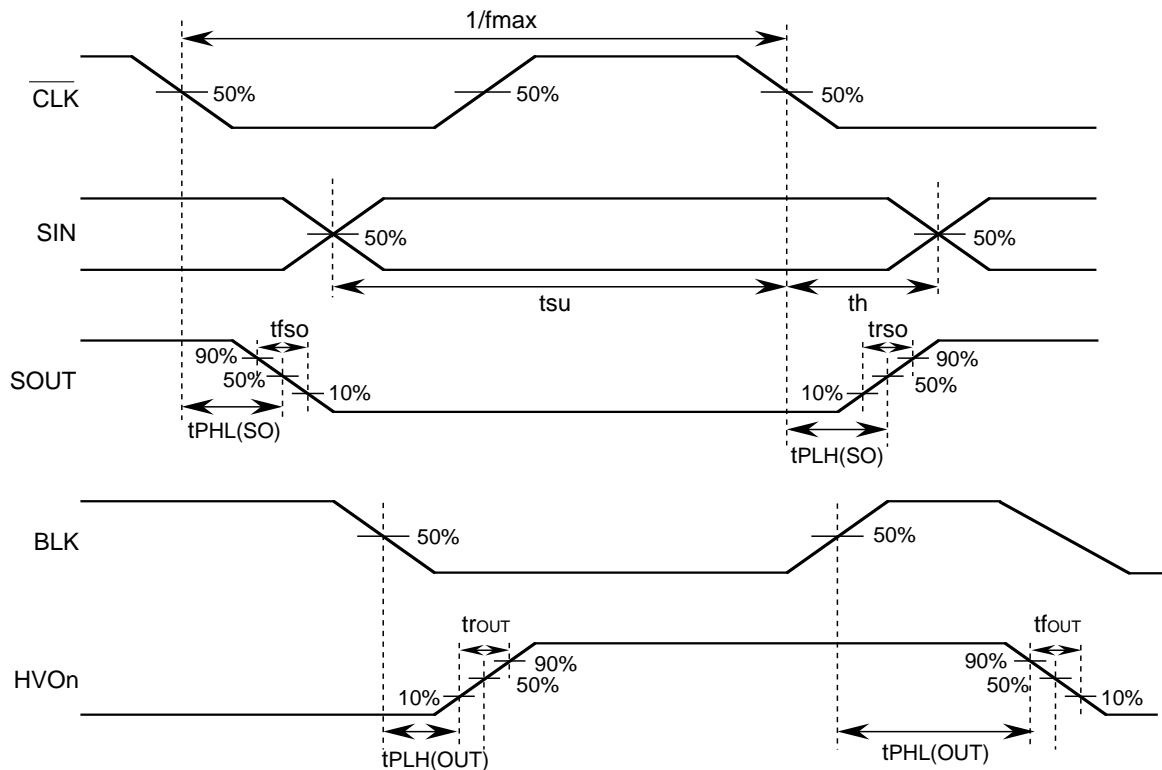
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
f _{CLK}	Clock frequency	Duty = 45 – 55%			8	MHz
t _{PLH(SO)}	Logic output propagation time	CL = 15pF		120	300	ns
t _{PHL(SO)}				100	300	ns
t _{PLH(OUT)}	Driver output propagation time	RO = 220KΩ CO = 50pF		1	2	μs
t _{PHL(OUT)}				0.16	1	μs
t _{rout}	Driver output rise and fall time			1.3	2.5	μs
t _{fout}				0.35	2	μs

TEST CIRCUIT



- (1) Pulse generator characteristics
tr ≤ 20ns tf ≤ 20ns
- (2) Capacitance CL includes connection floating capacitance and probe input capacitance.
: RO = 220KΩ
: CO = 50pF

TIMING WAVEFORM

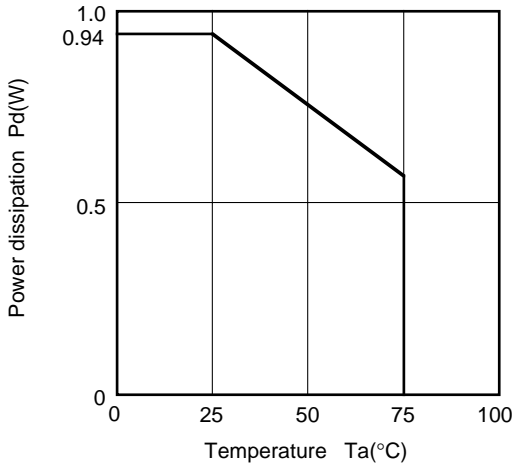


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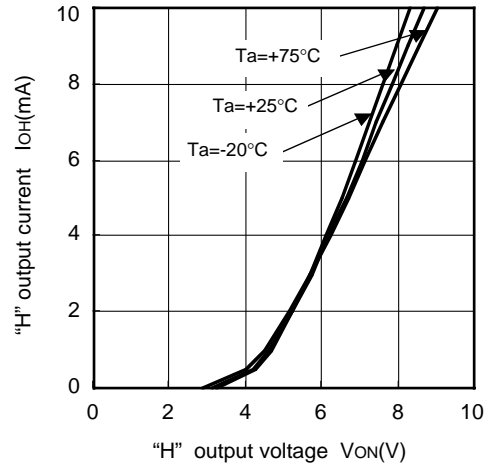
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TYPICAL CHARACTERISTICS

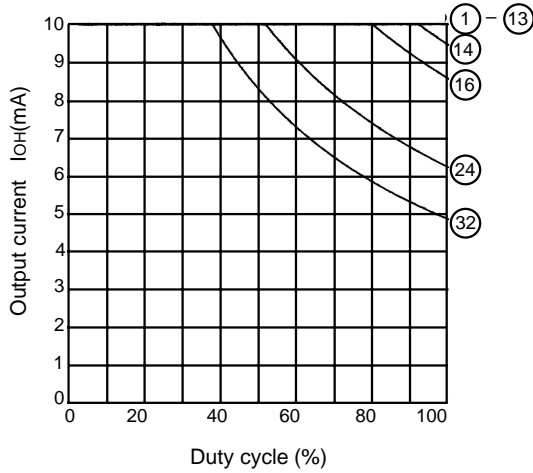
Thermal derating



Driver output $V_{ON}-I_{OH}$

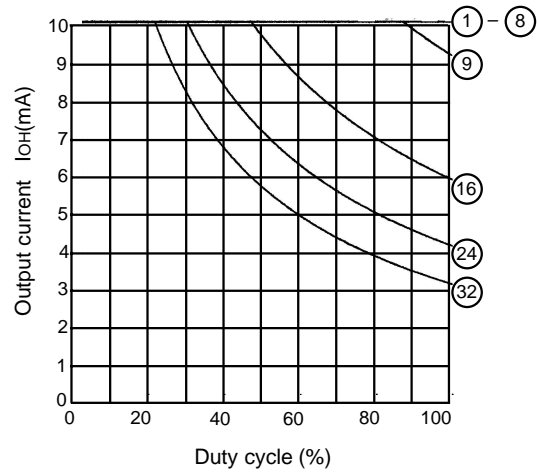


Duty cycle vs Permissible output current



- Note
- $T_a=25^\circ\text{C}$
 - Repeated frequency >100Hz
 - Figure in the circle represents the number of concurrently operating output circuits.
 - Current value denotes a numerical value per circuit.

Duty cycle vs Permissible output current



- Note
- $T_a=75^\circ\text{C}$
 - Repeated frequency >100Hz
 - Figure in the circle represents the number of concurrently operating output circuits.
 - Current value denotes a numerical value per circuit.

- Note
1. $V_{DD}=5\text{V}$ and $V_H=110\text{V}$, unless otherwise noted
 2. Thermal derating characteristics represent those of an individual IC unit.
 3. Allowable duty cycle output current characteristics represent that when a standard substrate is mounted. (Standard substrate: 70x70x1.6mm glass epoxy)