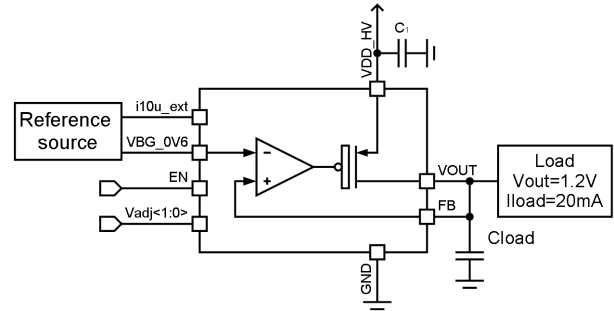


20mA low noise LDO voltage regulator (output voltage 1.1V/1.2V/1.3V/1.4V)
OVERVIEW

055TSMC_LDO_08 IP is low noise cap-based LDO voltage regulator designed to convert IO voltage 2.5V to 1.2V and supply analog circuits with load up to 20mA. The output voltage can be programmable in the range from 1.1V to 1.4V. Reference voltage 600mV and reference current 10uA should be applied for IP operation.



IP technology: TSMC 55nm EF.

IP status: silicon proven.

Silicon area: 0.0492mm².

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units	
			min	typ.	max		
Supply voltage	V_{DD_HV}	-	2.25	2.5	3.6	V	
Operating temperature range	T_j	-	-40	27	+125	°C	
Reference current	I_{i10u}	-	-	10	-	uA	
Reference voltage	V_{VBG}	-	-	600	-	mV	
Current consumption	I_{CC}	$I_{load} = 20mA$, without I_{i10u}	18	20	23	uA	
Line regulation	dV_{VOUT}	$2.25V < V_{DD_HV} < 3.6V$; $I_{load} = 20mA$	-	-	0.3	%	
Load regulation	dI_{VOUT}	$V_{DD_HV} = 3.3V$; $100uA < I_{load} < 20mA$	-	-	0.5	%	
Standby current	I_{stby}	-	-	17	45	nA	
Load current	I_{load}	-	-	10	20	mA	
Adjustment step	V_{adj}	-	-	100	-	mV	
Output voltage	V_{OUT}	$1mA < I_{load} < 20mA$; $2.25V < V_{DD_HV} < 3.6V$	$V_{adj} = "00"$	1.10	1.1	1.13	V
			$V_{adj} = "01"$	1.16	1.2	1.24	
			$V_{adj} = "10"$	1.25	1.3	1.35	
			$V_{adj} = "11"$	1.34	1.4	1.46	
Output voltage accuracy	ΔV_{OUT}	$I_{load} = 1mA$	-0.4	-	0.4	%	
		$1mA < I_{load} < 20mA$	-0.3	-	0.3		
Noise	Nrms	$C_{ext} = 1uF$, $I_{load} = 10mA$, $V_{DD_HV} = 2.5V$, $V_{OUT} = 1.2V$	@20Hz – 20kHz	-	50	-	uV
			@20Hz – 1MHz	-	54	-	
Power supply rejection ration	PSRR	$C_{load} = 1uF$, $I_{load} = 10mA$, $V_{DD_HV} = 2.5V$, $V_{OUT} = 1.2V$	@10Hz	40	64	-	dB
			@100Hz	41	62	-	
			@1kHz	52	59	-	
			@10kHz	57	59	-	
			@100kHz	33	35	-	
			@1MHz	49	53	-	
			@10MHz	61	66	-	
@100MHz	63	68	-				
Output voltage drop	V_{drop}	$V_{DD_HV} = 2.5V$, $I_{load} = 20mA$	-	80	140	mV	
Load capacitance	C_{load}	-	0.1	1	4.7	uF	