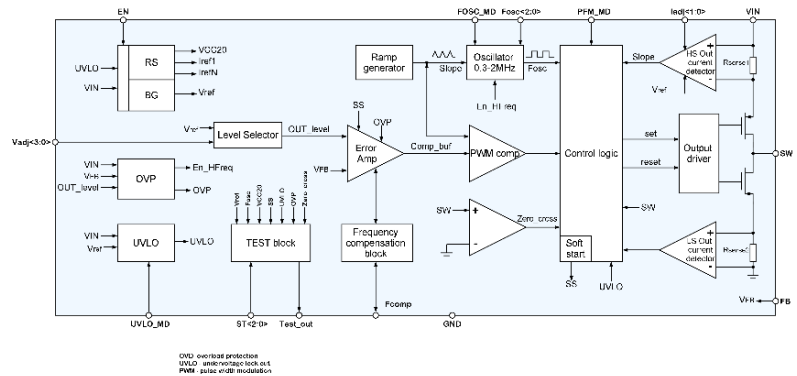


DC-DC down converter

OVERVIEW

055UMC_DCDC_01 is high-efficiency step-down DC-DC switching buck converter targeted for operation from 2.0V to 3.6V input voltage. It is able to supply circuits with 1.2V and up to 50 mA average output current. The DC-DC converter contains adjustment of output current limit, overload protection, and under voltage-lockout circuit. During startup time DC-DC converter works in the soft start mode, which provides the gradual increase of the output voltage. IP technology UMC 55nm eFlash CMOS technology. IP status: silicon proven. Area: 0.3707mm².



ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Units	
			min	typ.	max		
Operating temperature range	T _j	-	-40	27	100	°C	
Input supply voltage	V _{IN}	-	2	3	3.6	V	
Quiescent current	I _Q	I _{OUT} = 50mA, V _{OUT} = 1.2V, V _{IN} = 3.0V	-	0.3	1	mA	
Shutdown current	I _{shd}	-	-	35	250	nA	
UVLO threshold	V _{UVLO_R}	UVLO enabled	Rising	-	1.95	2.0	V
	V _{UVLO_F}		Falling	-	1.89	1.93	
Input logic-level high	V _{IL}	For digital inputs	V _{IN} -0.15	-	V _{IN}	V	
Input logic-level low	V _{IH}	For digital inputs	0	-	0.2	V	
Output voltage	V _{OUT}	Adjustable	1.14	1.2	1.26	V	
Output current	I _{OUT}	-	-	50	55	mA	
Output ripple	R _{OUT}	I _{OUT} = 5-50mA, R _b ¹ = 100mΩ, L _b ² = 1nH	8	35	-	mV	
OVP threshold	V _{OVP_R}	Rising, V _{adj} =1.2V	-	1.35	1.095×V _{OUT}	V	
	V _{OVP_F}	Falling, V _{adj} =1.2V	V _{OVP_R} - 0.14×V _{OUT}	1.12	-	V	
Power conversion efficiency	E	I _{OUT} = 50mA, V _{IN} = 2V ÷ 3.6V, R _b = 100mΩ, L _b = 1nH	80	89	-	%	
High-side switch-on resistance	R _{DS(on)}	V _{IN} = 3V, I _{OUT} = 50mA	-	1.0	2.0	Ω	
Low-side switch-on resistance		V _{IN} = 3V, I _{OUT} = 50mA	-	0.9	1.5	Ω	
Upper switch current limit ³	I _{LIM}	I _{adj} = min., V _{OUT} = 0V, V _{COMP} = 1.9V	-	150	220	mA	
Operating frequency	F _{OSC}	F _{osc} = 1MHz, V _{COMP} = 1V	0.680	1.0	1.45	MHz	
Short circuit switching frequency	F _{SW}	V _{OUT} < 0.3V	0.28	0.3	0.33	MHz	
Reference voltage	V _{REF}	-	642	651	657	V	
Maximum duty cycle	D _{max}	UVLO disabled	-	-	90	%	
COMP to current transconductance	G _{comp}	-	-	125	-	mA/V	
Startup time	T _{st}	90% V _{OUT}	-	1	7	ms	
Output capacitance	C _{OUT}	-	-	4.7	10	μF	
Output inductance	L _{OUT}	-	-	22	-	μH	

¹ Bondwire resistance

² Bondwire inductance

³ Average value of output current through inductor.