Elektronische Bauelemente

SDCGS5581

1Amp 6V 1.5MHz
Synchronous DC/DC Buck Converter

RoHS Compliant Product
A suffix of "-C" specifies halogen and lead-free

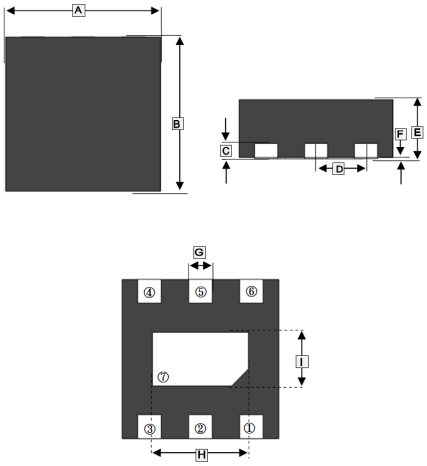
DESCRIPTION

The SDCGS5581 are high-efficiency, high frequency Synchrono us step-down DC-DC regulator ICs capable of delivering up to 1A output currents. The SDCGS5581 can operate over a wide input voltage range from 2.6V to 6V and integrates main switch and synchronous switch with very low $RDS_{(ON)}$ to minimize the conduction loss.

It is ideal for powering portable equipment that runs from a single cell Lithium-Ion (Li+) battery. The output voltage can be regulated as low as 0.6V.

The SDCGS5581 can also run at 100% duty cycle for low dropout operation, extending battery life in portable system. This device offers two operation modes, PWM mode and PFM Mode switching control, which allows a high efficiency over the wider range of the load.

DFN2*2

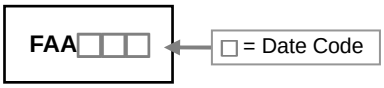


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	1.95	2.05	F	0.01	0.05
B	1.95	2.05	G	0.25	0.35
C	0.18	0.25	H	1.00	1.45
D	0.65 BSC.		I	0.50	0.85
E	0.70	0.80			

FEATURES

- High Efficiency: Up to 96%
- 1.5MHz Constant Frequency Operation
- 1000mA Output Current
- No Schottky Diode Required
- 2.6V to 6V Input Voltage Range
- Adjustable Output Voltage Range Options from 0.6V to VIN
- 100% Duty Cycle Low Dropout Operation
- Low Quiescent Current: 35μA
- Slope Compensated Current Mode Control for Excellent Line and Load Transient Response
- Short Circuit Protection
- Thermal Fault Protection
- Inrush Current Limit and Soft Start
- <1μA Shutdown Current
- RoHS Compliant, 100%Pb & Halogen Free

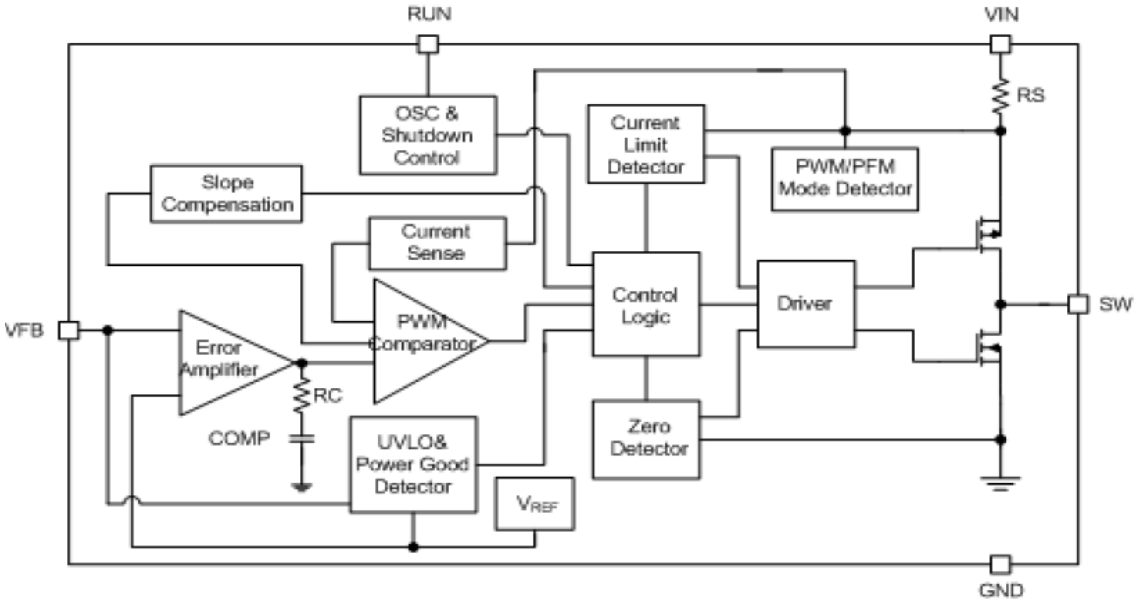
MARKING



PIN DESCRIPTION

Pin No.	Name	Description
1	NC	No Intemal Connection
2	EN	Chip Enable
3	V_{IN}	Power Input
4	LX	Pin for Switching
5、7	GND	Ground
6	FB	Feedback

BLOCK DIAGRAM



TYPICAL APPLICATIONS

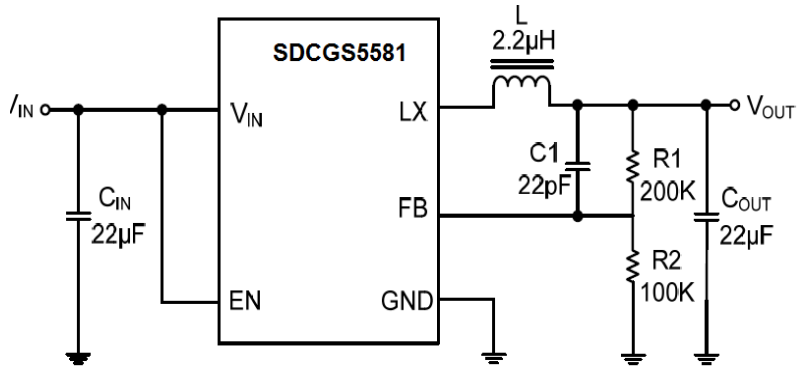


Figure1. Adjustable Output Voltage Regulator

ABSOLUTE MAXIMUM RATINGS[1] (T_A=25 ℃, unless otherwise specified)

Parameter	Symbol	Value	Unit
Current sense and voltage feedback inputs	V_{IN}	-0.3~6.5	V
RUN, FB Voltages		-0.3~6.5	V
SW Voltage	V_{SW}	-0.3 to (V_{IN}+0.3)	V
Peak SW Sink and Source Current	I_{PK}	2.5	A
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	130	℃ / W
Storage Temperature Range	T_{STG}	-65 ~ 150	℃
Lead Temperature (Soldering 10sec)	T_{LEAD}	300	℃
Operating Junction Temperature [2]	T_J	125	℃
Operating ambient Temperature	T_A	-40 ~ 85	℃

Note：

1. Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.
2. T_J is calculated from the ambient temperature T_A and power dissipation P_D according to the following formula: $T_J = T_A+(P_D)*(\theta_{JA})$.

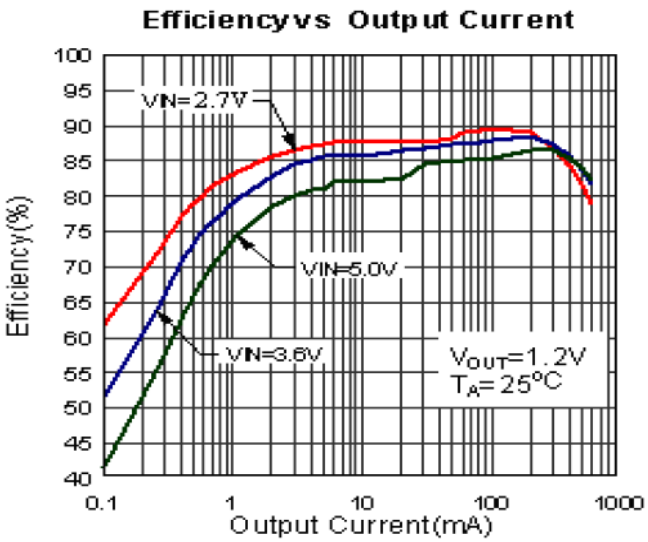
ELECTRICAL CHARACTERISTICS[1] (V_{IN}=V_{EN}=3.6V, V_{OUT}=1.8V, T_A=25℃, unless otherwise noted.)

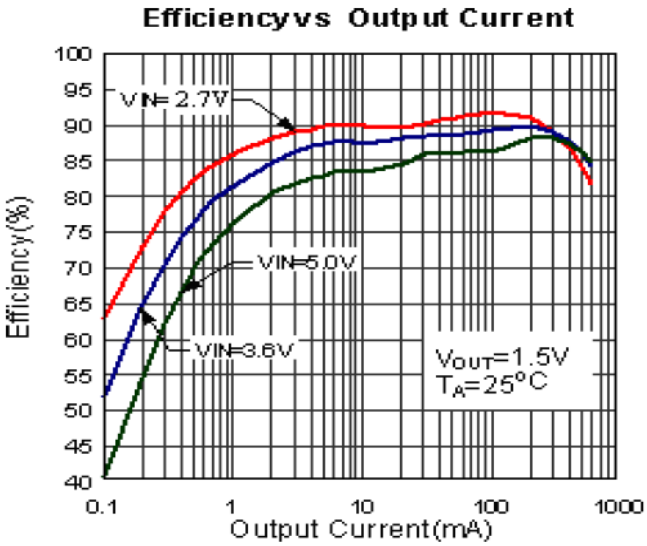
Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage Range	V_{IN}		2.6	-	6	V
UVLO Threshold	V_{UVLO}	V_{IN} Rising	-	2.4	-	V
Input DC Supply Current	I_Q	I_{LOAD}=0mA	-	35	70	μA
Shutdown Mode [2]	I_{SHDN}	V_{RUN}=0V, V_{IN}=4.2V	-	0.1	1	μA
Regulated Feedback Voltage	V_{FB}	T_A=25℃	0.588	0.6	0.612	V
		0℃ ≦T_A≦85℃	0.586	0.6	0.613	
		-40℃ ≦T_A≦85℃	0.585	0.6	0.615	
V_{EN} Threshold	V_{EN}		0.3	1	1.5	V
I_{EN} Leakage Current	I_{EN}			±0.01	±1	μA
SW Leakage Current	I_{SW}	V_{EN}=0, V_{IN}=V_{SW}=5V	-	±0.01	±1	μA
On Resistance of PMOS	$R_{DS(ON)H}$	I_{SW}=100mA	-	0.13	0.2	Ω
On Resistance of NMOS	$R_{DS(ON)L}$		-	0.1	0.2	
Peak Current Limit	I_{PK}	V_{IN}=3V, V_{OUT}= 90%	-	2	-	A
Reference Voltage Line Regulation	△V_{FB}	V_{IN}=2.6V to 6V	-	0.04	0.4	%/V
Output Voltage Line Regulation	REG_{LINE}	V_{IN}=2.6V to 6V	-	0.04	0.4	%
Output Voltage Load Regulation	REG_{LOAD}		-	0.5	-	%
Oscillation Frequency	F_{OSC}	V_{OUT}=100%, V_{OUT}=0V	-	1.5	-	MHz
			-	300	-	KHz

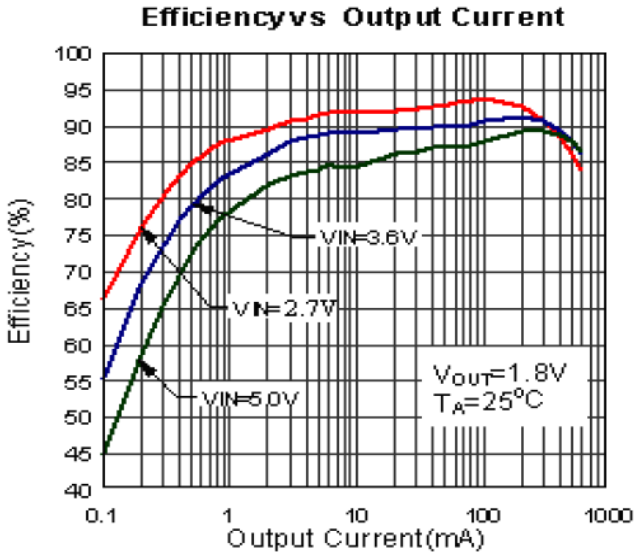
Note：

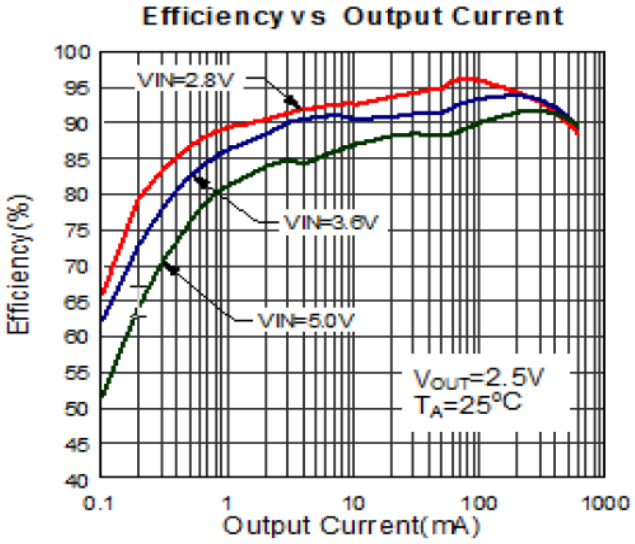
1. 100% Production Test at +25℃. Specifications ov er the temperature range are guaranteed by design and characterization.
2. Dynamic supply current is higher due to the gate charge being delivered at the switching frequency.

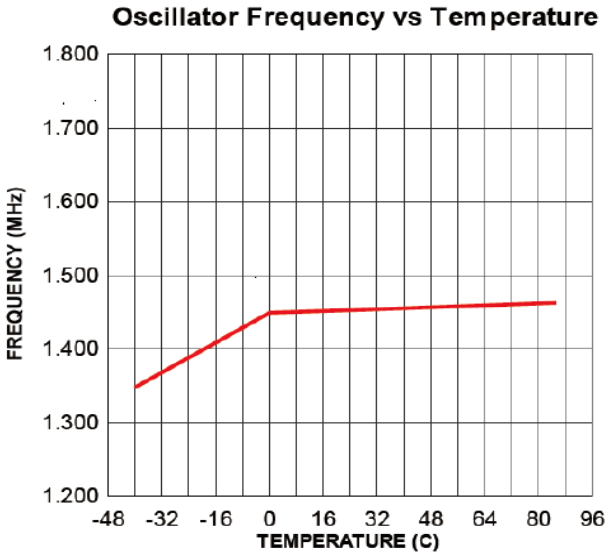
RATINGS AND CHARACTERISTIC CURVES

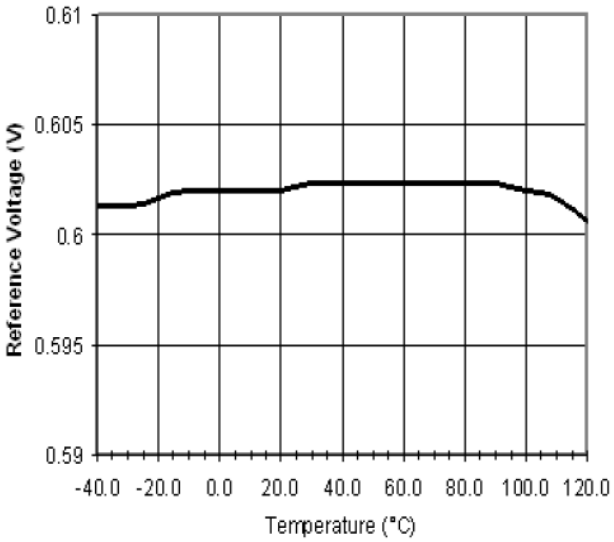






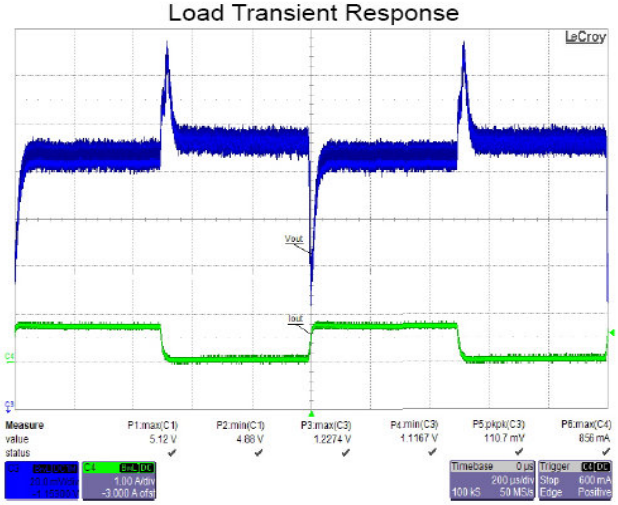






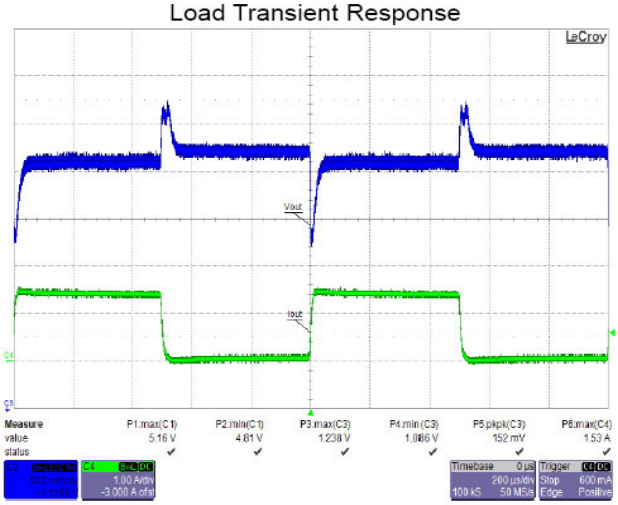
RATINGS AND CHARACTERISTIC CURVES

Load Transient Response



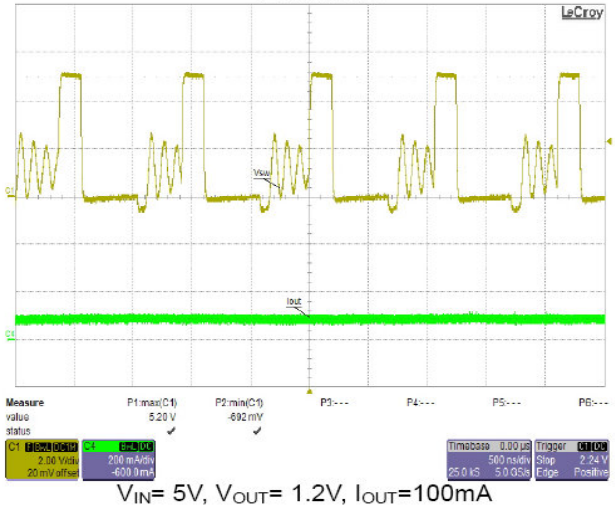
V_{IN}= 5V, V_{OUT}= 1.2V, I_{OUT}=50mA to 800mA

Load Transient Response



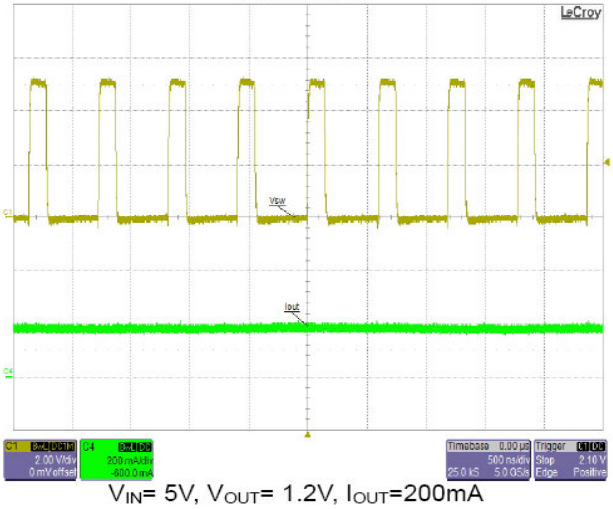
V_{IN}= 5V, V_{OUT}= 1.2V, I_{OUT}=50mA to 1.3A

PFM Mode



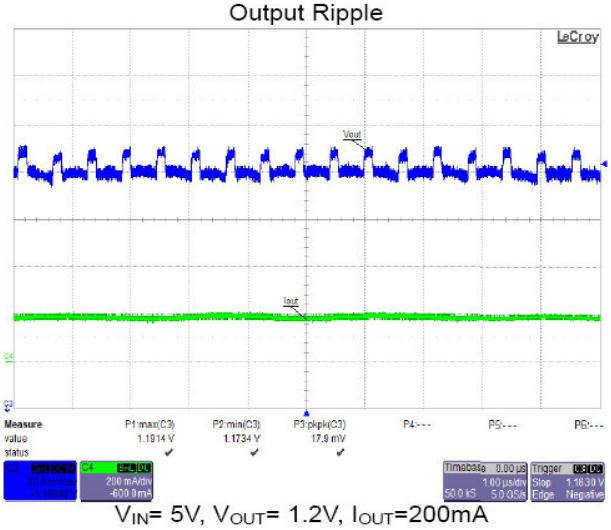
V_{IN}= 5V, V_{OUT}= 1.2V, I_{OUT}=100mA

PWM Mode



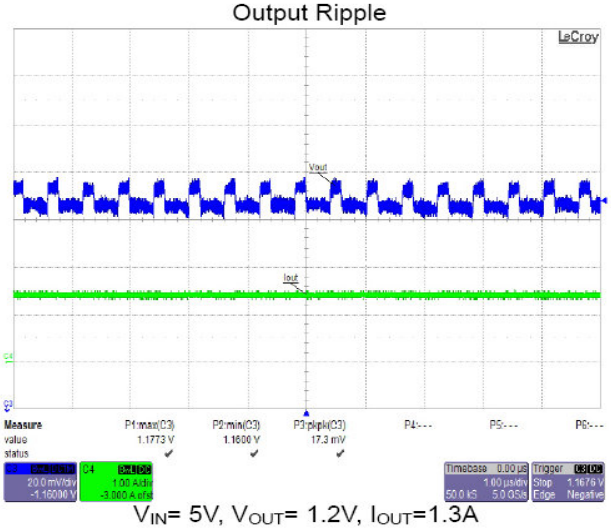
V_{IN}= 5V, V_{OUT}= 1.2V, I_{OUT}=200mA

Output Ripple



V_{IN}= 5V, V_{OUT}= 1.2V, I_{OUT}=200mA

Output Ripple



V_{IN}= 5V, V_{OUT}= 1.2V, I_{OUT}=1.3A