

GENERAL DESCRIPTION

The SGM2042 is a dual low dropout CMOS regulator with low $R_{DS(ON)}$, high PSRR, low output noise and low quiescent current.

Each of the two regulators includes an error amplifier and current limit circuit. With the integrated resistor network, fixed output voltage versions can be delivered. With its low power consumption and fast line and load transient responses, the SGM2042 is well suited for low power handheld communication equipment.

The SGM2042 is available in a Green UTDFN-1×1-4AL package, and allows for small footprint and dense PCB layout. It operates over an ambient temperature range of -40°C to +85°C.

FEATURES

- **Wide Input Voltage Range: 1.6V to 5.5V**
- **Output Voltage Accuracy: ±1% at +25°C**
- **Output Current: 100mA per Channel**
- **Power Supply Rejection Ratio: 65dB (TYP) at 1kHz**
- **Low Output Noise: 145 μ V_{RMS} from 10Hz to 100kHz**
- **Low Quiescent Current: 40 μ A (TYP) per Channel**
- **Fast Line and Load Transient Responses**
- **Over-Current Protection**
- **-40°C to +85°C Operating Temperature Range**
- **Available in a Green UTDFN-1×1-4AL Package**

APPLICATIONS

- Fingerprint Module
- Smart Phone/PAD
- RF Supply
- Cameras
- Portable Video
- Portable Media Player

TYPICAL APPLICATION

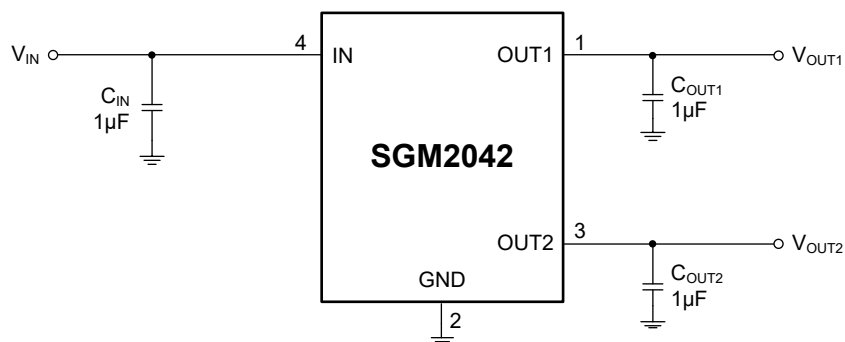


Figure 1. Typical Application Circuit

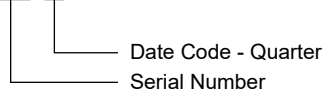
PACKAGE/ORDERING INFORMATION

ORDERING NUMBER	V _{OUT1}	V _{OUT2}	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	PACKAGE MARKING	PACKING OPTION
SGM2042-EIYUDH4G/TR	1.8V	0.75V	UTDFN-1×1-4AL	-40°C to +85°C	EBX	Tape and Reel, 10000
SGM2042-EKYUDH4G/TR	1.8V	0.70V	UTDFN-1×1-4AL	-40°C to +85°C	E9X	Tape and Reel, 10000

MARKING INFORMATION

NOTE: X = Date Code.

YY X



Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

ABSOLUTE MAXIMUM RATINGS

Input Voltage.....	6V
Output Voltage.....	-0.3V to V _{IN} + 0.3V
Junction Temperature.....	+150°C
Storage Temperature Range.....	-65°C to +150°C
Lead Temperature (Soldering, 10s).....	+260°C
ESD Susceptibility	
HBM.....	8000V
MM.....	400V
CDM.....	1000V

RECOMMENDED OPERATING CONDITIONS

Input Voltage Range.....	1.6V to 5.5V
Output Current Range.....	0mA to 100mA
Operating Temperature Range.....	-40°C to +85°C

OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.

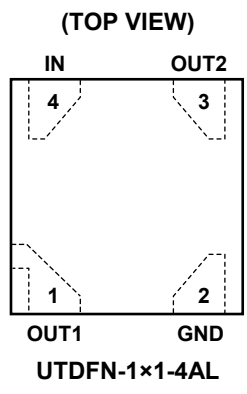
ESD SENSITIVITY CAUTION

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

PIN CONFIGURATION



PIN DESCRIPTION

PIN	NAME	FUNCTION
1	OUT1	Channel 1 Output Voltage Pin.
2	GND	Ground.
3	OUT2	Channel 2 Output Voltage Pin.
4	IN	Power Input Pin.

ELECTRICAL CHARACTERISTICS

($V_{IN} = V_{OUT(NOM)} + 1.0V$ ($V_{OUT(NOM)} > 1.5V$) or $V_{IN} = 2.5V$ ($V_{OUT(NOM)} \leq 1.5V$), $I_{OUT} = 1mA$, $C_{IN} = C_{OUT1} = C_{OUT2} = 1\mu F$, Full = $-40^{\circ}C$ to $+85^{\circ}C$, typical values are at $T_A = +25^{\circ}C$, unless otherwise noted.)

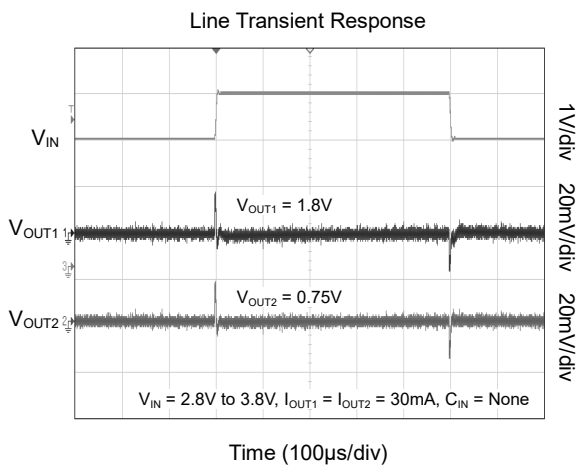
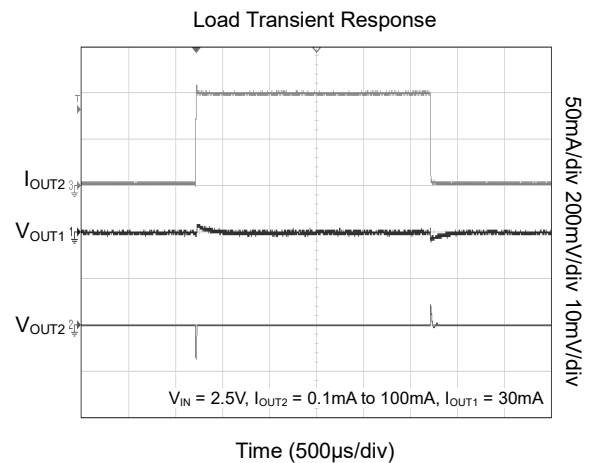
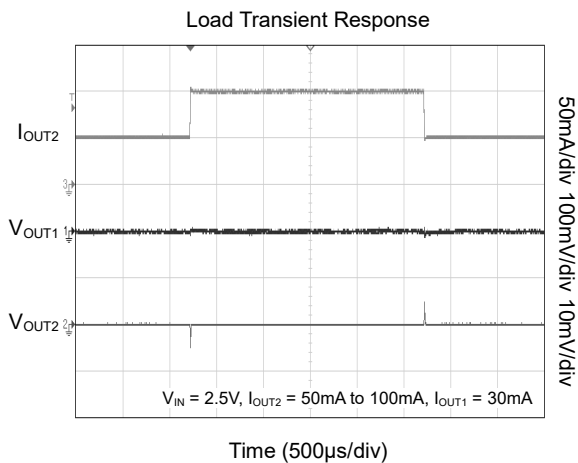
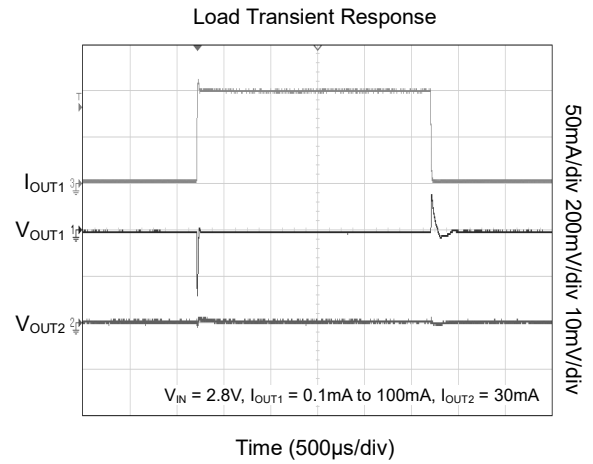
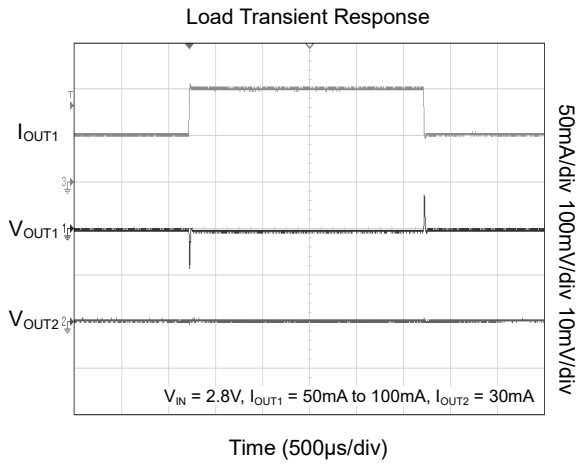
PARAMETER	SYMBOL	CONDITIONS	TEMP	MIN	TYP	MAX	UNITS	
Input Voltage Range	V_{IN}		Full	1.6		5.5	V	
Output Voltage Accuracy	V_{OUT}	$V_{IN} = (V_{OUT(NOM)} + 1.0V)$ to 5.5V, $I_{OUT} = 1mA$ to 100mA	+25°C	-1		1	%	
			Full	-2		2		
Maximum Output Current			Full	100			mA	
Ground Pin Current ⁽¹⁾	I_Q	No Load	+25°C		40	62	μA	
			Full			66		
Power Supply Rejection Ratio	PSRR	$V_{IN} = (V_{OUT(NOM)} + 1.0V)_{DC} + 0.2V_{P-PAC}$, $V_{OUT(NOM)} = 1.8V$, $I_{OUT} = 30mA$, $f = 1kHz$	+25°C		65		dB	
Output Voltage Noise	e_n	BW = 10Hz to 100kHz, $V_{OUT(NOM)} = 1.8V$, $I_{OUT} = 30mA$	+25°C		145		μV_{RMS}	
Dropout Voltage ⁽²⁾	V_{DROP}	$I_{OUT} = 100mA$	$V_{OUT(NOM)} = 0.7V$	+25°C		0.87	1.1	V
				Full			1.15	
			$V_{OUT(NOM)} = 1.8V$	+25°C		0.22	0.3	
				Full			0.34	
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{OUT} \times \Delta V_{OUT}}$	$V_{IN} = (V_{OUT(NOM)} + 1.0V)$ to 5.5V, $I_{OUT} = 1mA$	+25°C		0.01	0.05	%V	
			Full			0.07		
Load Regulation	ΔV_{OUT}	$V_{IN} = V_{OUT(NOM)} + 1.0V$, $I_{OUT} = 1mA$ to 100mA	+25°C		4	6	mV	
			Full			8		
Output Voltage Temperature Coefficient		$I_{OUT} = 50mA$	Full		80		ppm/°C	
Over-Current Protection	OCP		+25°C	115	190		mA	
			Full	100				

NOTES:

1. Ground pin current defined here is the difference in current between the input and the output.
2. Dropout voltage is characterized when V_{OUT} falls 2% below $V_{OUT(NOM)}$.

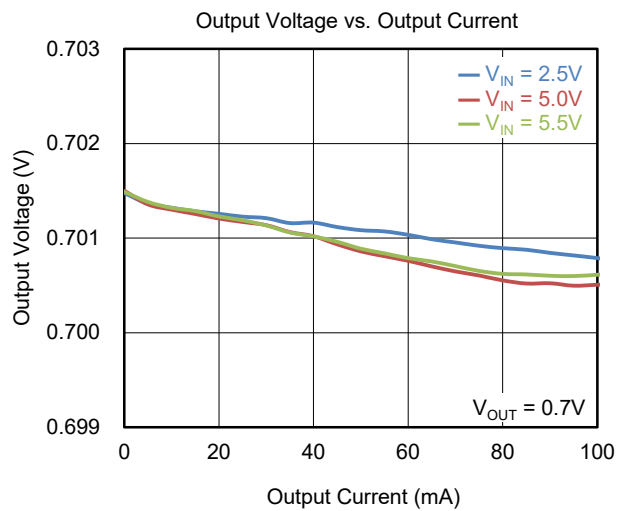
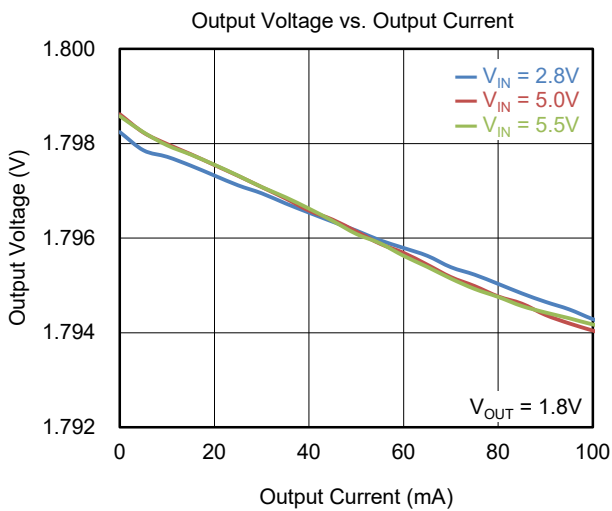
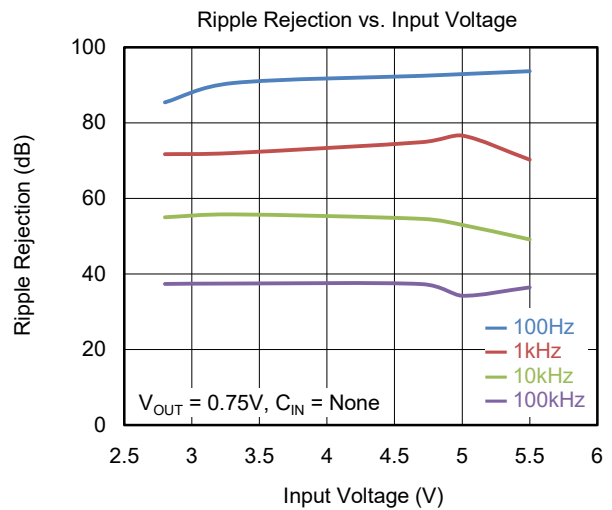
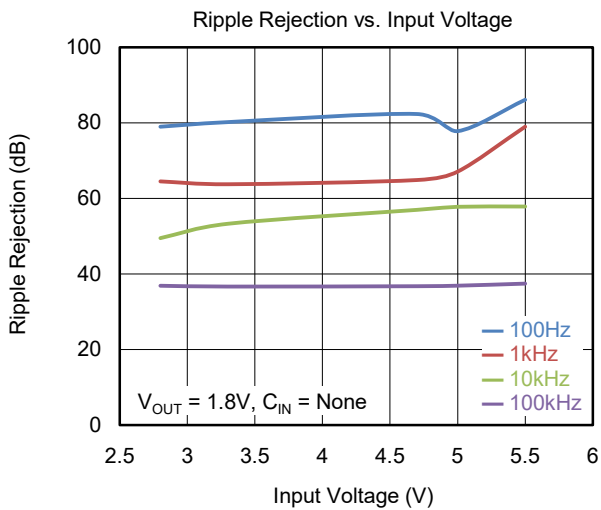
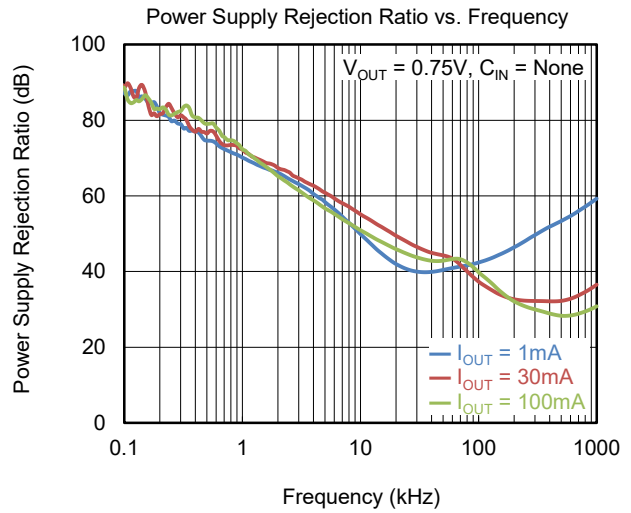
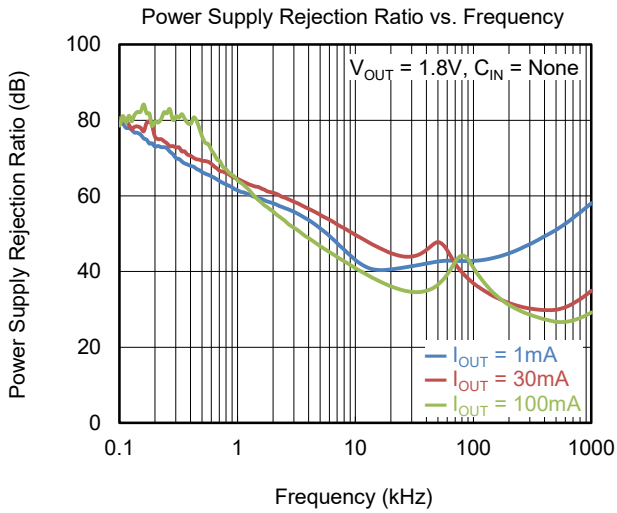
TYPICAL PERFORMANCE CHARACTERISTICS

$T_A = +25^\circ\text{C}$, $V_{IN} = V_{OUT(NOM)} + 1.0\text{V}$, $C_{IN} = C_{OUT1} = C_{OUT2} = 1\mu\text{F}$, unless otherwise noted.



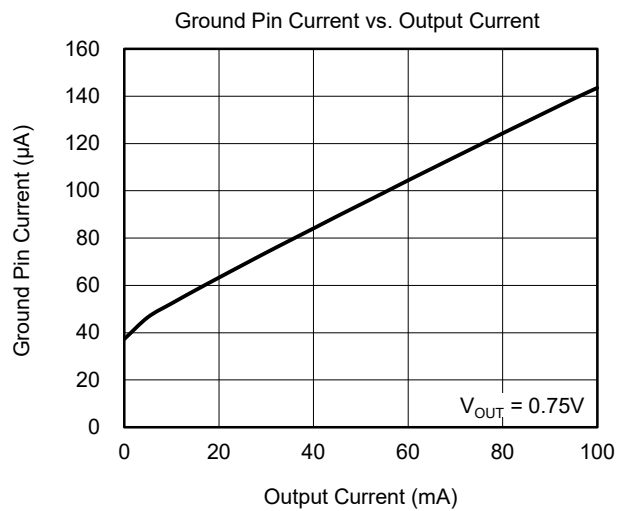
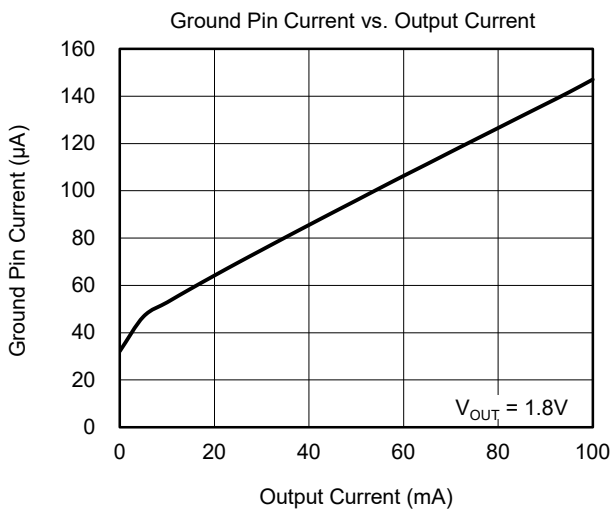
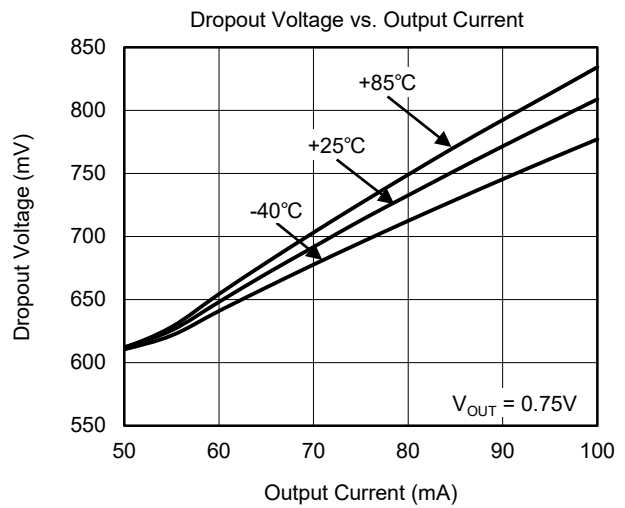
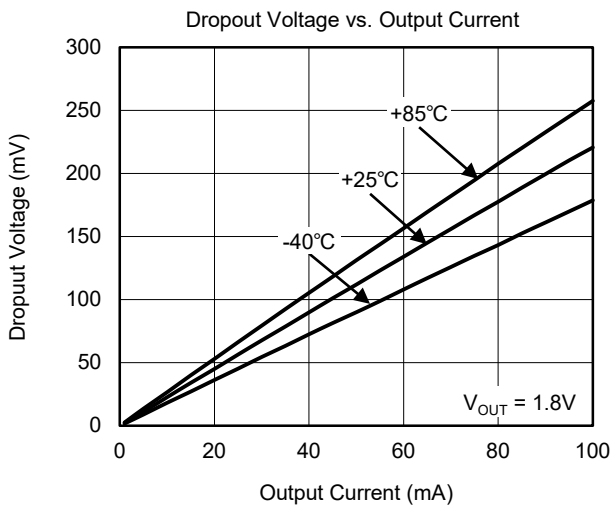
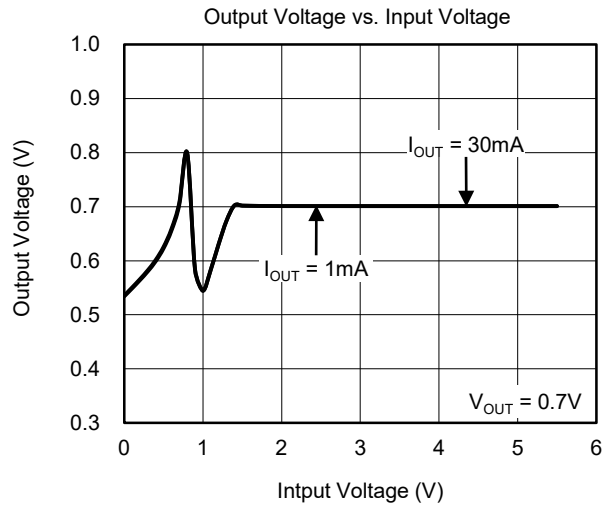
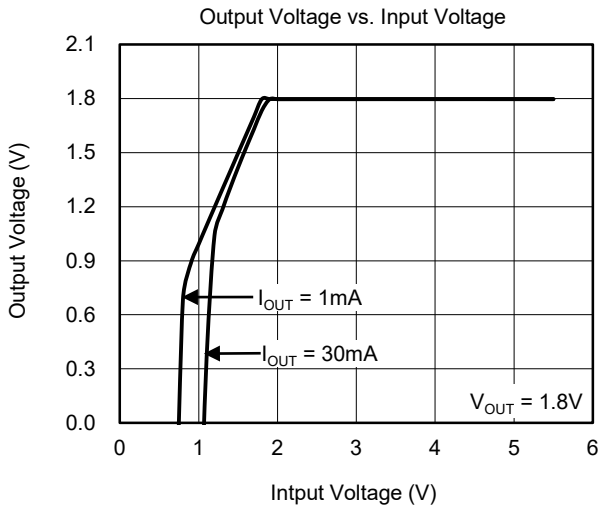
TYPICAL PERFORMANCE CHARACTERISTICS (continued)

T_A = +25°C, V_{IN} = V_{OUT(NOM)} + 1.0V, C_{IN} = C_{OUT1} = C_{OUT2} = 1μF, unless otherwise noted.



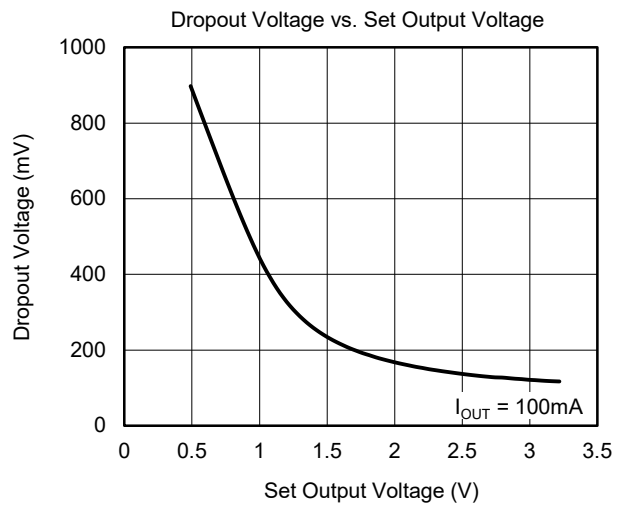
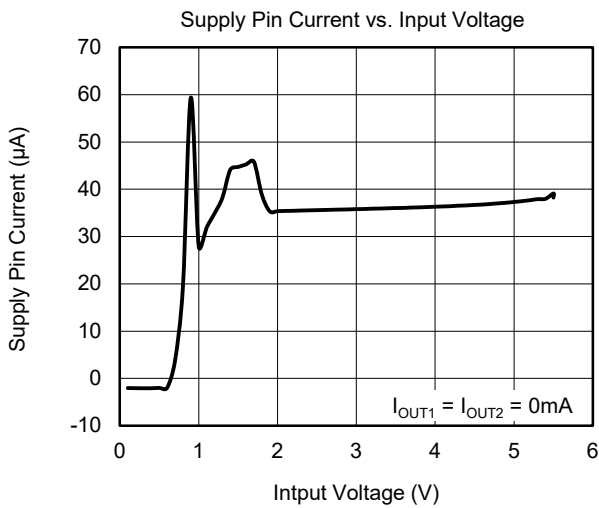
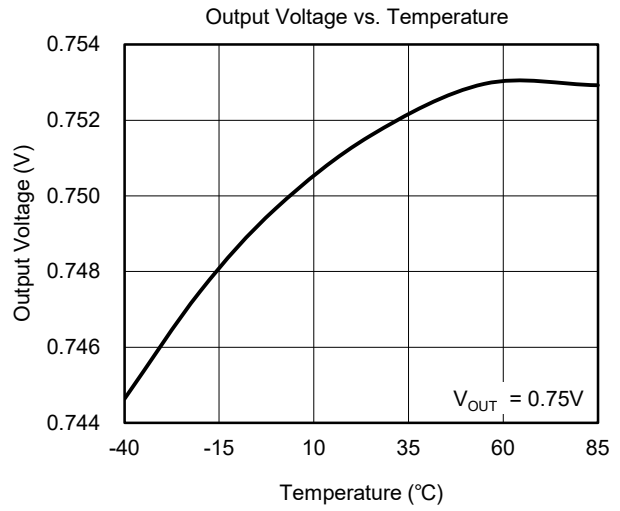
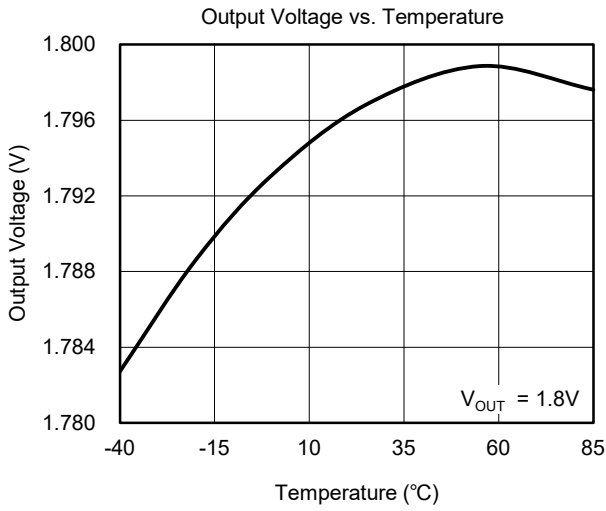
TYPICAL PERFORMANCE CHARACTERISTICS (continued)

$T_A = +25^\circ\text{C}$, $V_{IN} = V_{OUT(NOM)} + 1.0\text{V}$, $C_{IN} = C_{OUT1} = C_{OUT2} = 1\mu\text{F}$, unless otherwise noted.



TYPICAL PERFORMANCE CHARACTERISTICS (continued)

$T_A = +25^\circ\text{C}$, $V_{IN} = V_{OUT(NOM)} + 1.0\text{V}$, $C_{IN} = C_{OUT1} = C_{OUT2} = 1\mu\text{F}$, unless otherwise noted.



FUNCTIONAL BLOCK DIAGRAM

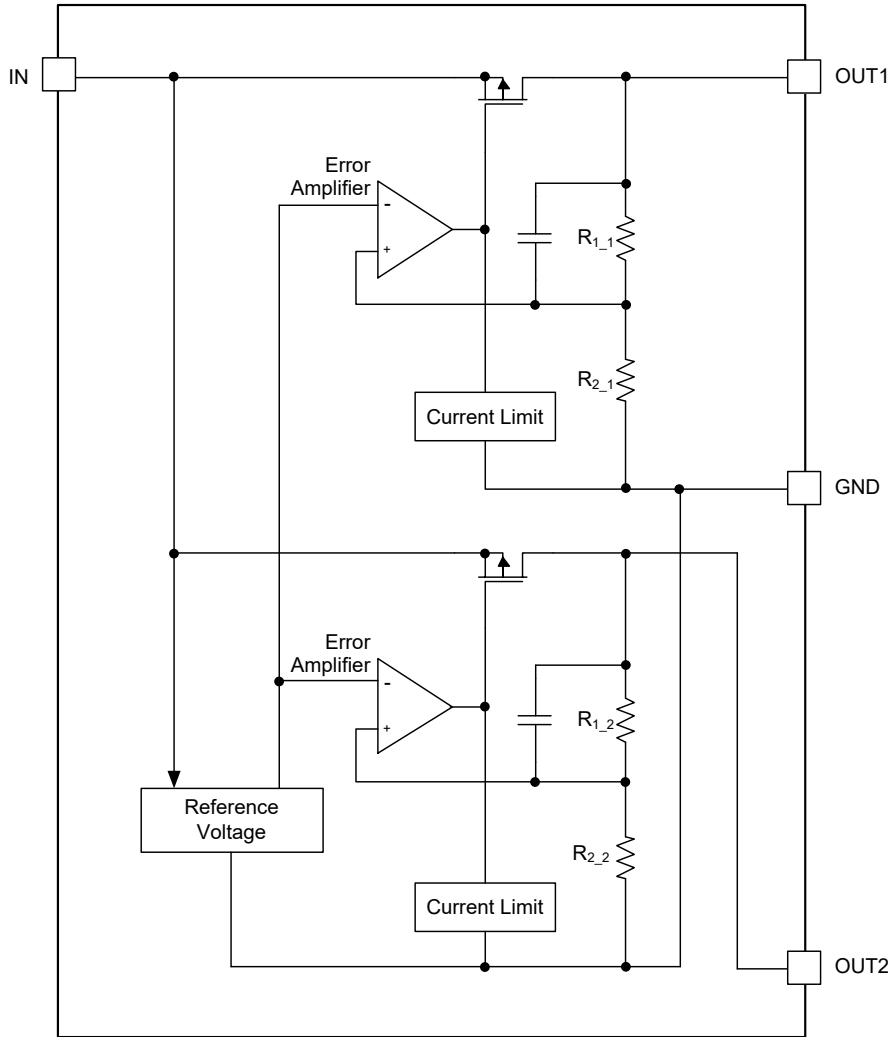


Figure 2. Block Diagram

APPLICATION INFORMATION

Output Capacitors (C_{OUT1} , C_{OUT2})

Output capacitors are required to improve transient response and maintain stability. The SGM2042 is stable with very small ceramic output capacitors. If the application has large load variations, it is recommended to use low-ESR bulk capacitors. It is recommended to place ceramic capacitors as close as possible to the OUTx pins and the GND pin, and care should be taken to reduce the impedance in the layout.

Input Capacitor (C_{IN})

To prevent the input voltage from dropping during load steps, it is recommended to use an input capacitor. A minimum 1 μ F ceramic capacitor is recommended between IN pin and GND pin to decouple input power supply glitch. This input capacitor must be located as close as possible to the device to ensure input stability and reduce noise. For PCB layout, a wide copper trace is required for both IN pin and GND pin.

Layout Considerations

For good stability, the input and output capacitors should be located close to the IN pin, OUTx pins and GND pin of the device. The regulator GND pin should be connected to the external circuit ground to reduce voltage drop caused by trace impedance. Ground plane is generally used to reduce trace impedance. Wide trace should be used for large current paths from IN to OUTx pins and to load circuit.

ESR vs. Output Current

Ceramic output capacitors are recommended for this device; however, other types of output capacitors with low ESR also can be used.

REVISION HISTORY

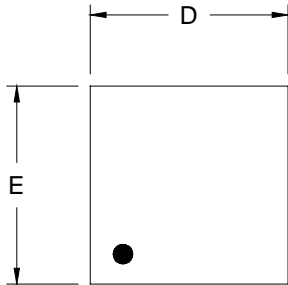
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Original (DECEMBER 2018) to REV.A

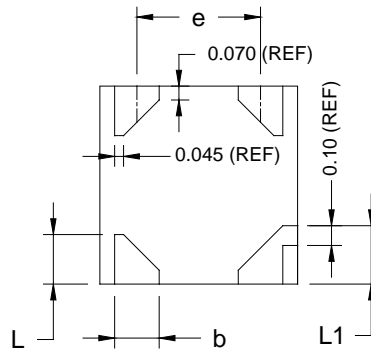
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PACKAGE OUTLINE DIMENSIONS

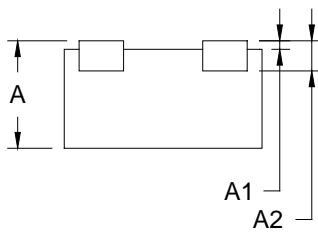
UTDFN-1x1-4AL



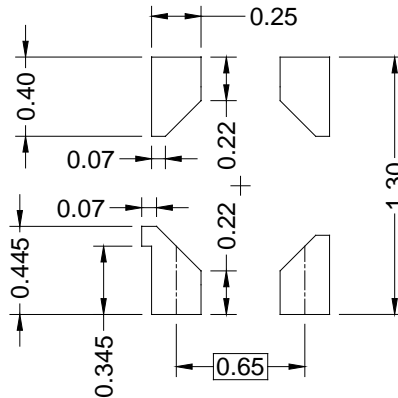
TOP VIEW



BOTTOM VIEW



SIDE VIEW



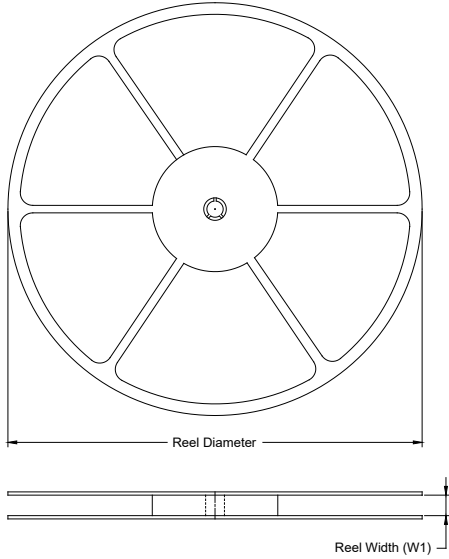
RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	0.500	0.550	0.600
A1	0.000		0.050
A2	0.152 REF		
e	0.625 BSC		
D	0.950	1.000	1.050
E	0.950	1.000	1.050
b	0.175	0.225	0.275
L	0.200	0.250	0.300
L1	0.245	0.295	0.345

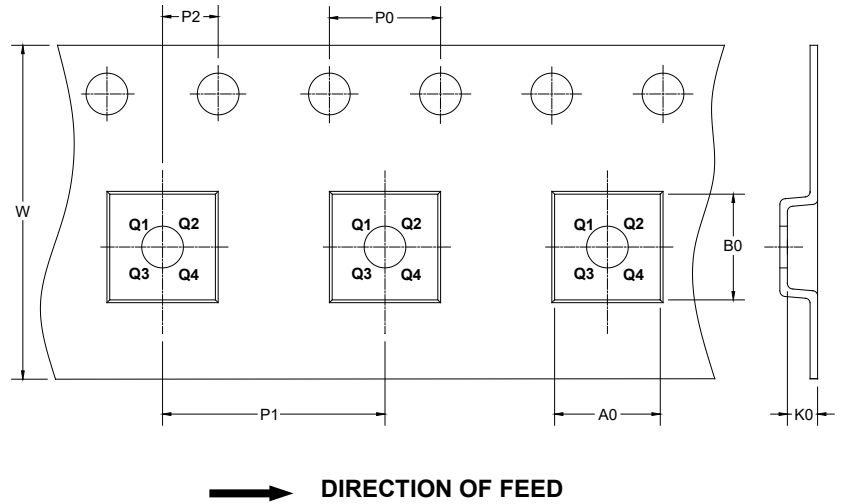
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
UTDFN-1×1-4AL	7"	9.0	1.18	1.18	0.68	4.0	2.0	2.0	8.0	Q1

000001

PACKAGE INFORMATION

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
7" (Option)	368	227	224	8
7"	442	410	224	18

DD0002