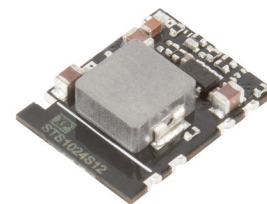


1.0 Amp

- Regulated single outputs from 1.2 to 15VDC
- Wide input range
- SMD-10 package
- Non-isolated
- Output voltage trim $\pm 10\%$
- High efficiency up to 96%
- Class B conducted & radiated emissions with external components
- Short-circuit protection
- No heatsink required
- Remote On/Off
- Tape & reel package available
- -40°C to $+105^{\circ}\text{C}$ operation
- Full load to $+65^{\circ}\text{C}$
- 3 year warranty



Dimensions:

STS10:

0.60 x 0.47 x 0.15" (15.20 x 11.80 x 3.6 mm)

The STS10 is a new series of innovative low cost DC-DC buck regulators. Based on SMD technology and high levels of automation the series offers many features including voltage trimming, remote on/off, continuous short circuit protection, regulation and high efficiency.

Models & Ratings

Input voltage VDC	Output voltage VDC	Output Current A	Maximum Capacitive Load	Efficiency at minimum input %	Efficiency at maximum input %	Model ⁽¹⁾
5 V (3-5.5)	1.2	1.0 A	330 μF	90.5%	90.5%	STS1005S1V2
5 V (3-5.5 V)	1.5			92.0%	92.0%	STS1005S1V5
5 V (3-5.5 V)	1.8			92.5%	92.5%	STS1005S1V8
5 V (3.8-5.5 V)	2.5			94.5%	94.0%	STS1005S2V5
24 V (4.6-36 V)	1.2			87.0%	72.0%	STS1024S1V2
24 V (4.6-36 V)	1.5			89.0%	76.0%	STS1024S1V5
24 V (4.6-36 V)	1.8			90.5%	79.0%	STS1024S1V8
24 V (4.6-36 V)	2.5			92.5%	83.0%	STS1024S2V5
24 V (4.75-36 V)	3.3			94.0%	86.5%	STS1024S3V3
24 V (6.5-36 V)	5.0			95.5%	89.5%	STS1024S05
24 V (9-36 V)	6.5			94.5%	90.0%	STS1024S6V5
24 V (12-36 V)	9.0			95.5%	92.0%	STS1024S09
24 V (15-36 V)	12.0			95.0%	93.0%	STS1024S12
24 V (18-36 V)	15.0			96.0%	94.0%	STS1024S15

Notes

1. For tape & reel add "-TR", e.g. STS1005S1V5-TR. 500 pcs per reel.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	3	5	5.5	VDC	
	4.6	24	36		
Input Surge			6	VDC for 100 ms	5 V input
			40		24 V input
Input Current - No Load - Full Load		0.4/1.5		mA	5 V/24 V input
		700/900			5 V/24 V input
Input Current - Remote On/Off			0.3/0.8	mA	5 V/24 V input, idle current
Remote On/Off	ON: Connect pin 10 to voltage of 2-4 V, Logic high OFF: Short pin 10 to pin 9 (0-0.4 V), Logic low				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	1.2		15	VDC	See Models and Ratings table
Initial Set Accuracy			±2.0	%	
Minimum Load				A	No minimum load required
Line Regulation			±0.2	%	
Load Regulation			±0.6	%	To 100% load from 10%
Transient Response	<4V		±5	%	Maximum deviation recovery within 250 µs at normal Vin for 50% step load change from 50% to 100% load
	>4V		±3		
Ripple & Noise		50		mV pk-pk	5 V: 20 MHz bandwidth
		75			24 V: 20 MHz bandwidth
Short Circuit Protection					Continuous, with auto recovery
Temperature Coefficient			0.02	%/°C	

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency			96	%	See Models and Ratings table
Isolation: Input to Output					No isolation
Switching Frequency		1.2/0.41		MHz	5 V/24 V input
Mean Time Between Failure	3.5			MHrs	MIL-HDBK-217F, +25 °C GB
Weight		0.022 (1.4)		lb (g)	
Moisture Sensitivity Level	Level 1				IPC/JEDEC J-STD-020D.1

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+105	°C	See Derating Curve.
Storage Temperature	-55		+125	°C	
Humidity			95	%RH	Non-condensing
Cooling					Natural convection (>30 LFM)
Lead-Free Reflow Solder Process	260 °C max, 1.5 mm from case, 10 s max. IPC/JEDEC J-STD-020D.1				

EMC: Emissions

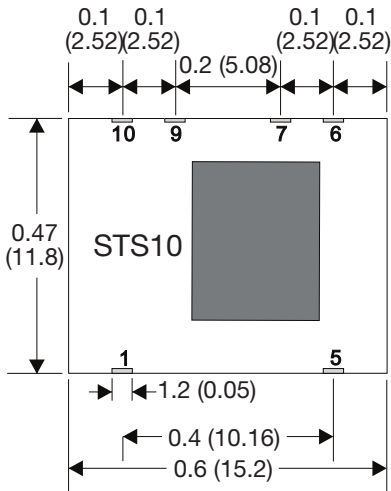
Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class B	With external components, see application note
Radiated	EN55032	Class B	

EMC: Immunity

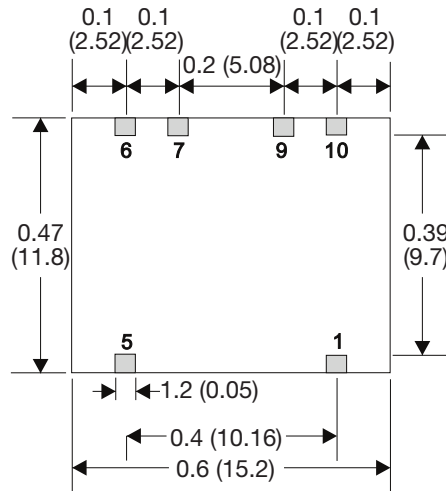
Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD	EN61000-4-2	±8 kV air discharge	A	
Radiated	EN61000-4-3	3 V/m	A	
EFT/Burst	EN61000-4-4	±0.5 kV	A	See application note
Surge	EN61000-4-5	±1 kV	A	See application note
Conducted	EN61000-4-6	3 V rms	A	
Magnetic Fields	EN61000-4-8	3 A/m	A	

Mechanical Details

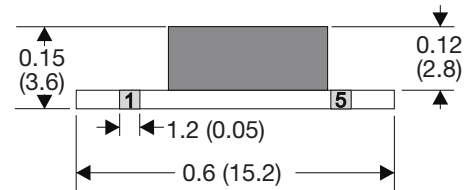
Top View



Bottom View



Side View



Pin Connections	
Pin	Function
1	+Vin
5	+Vout
6	Trim
7	-Vout
9	-Vin
10	Remote On/Off

Notes

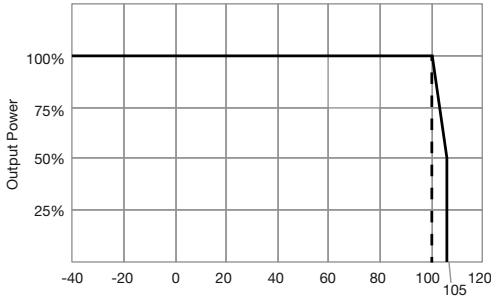
1. All dimensions are in inches (mm)
2. Weight: 0.0022 lbs (1.4 g) approx.
3. Pin Profile Tolerance: ±0.004 (±0.1)

4. Pin Pitch Tolerance: ±0.01 (±0.25)
5. Other Tolerances: ±0.02 (±0.5)

Application Notes

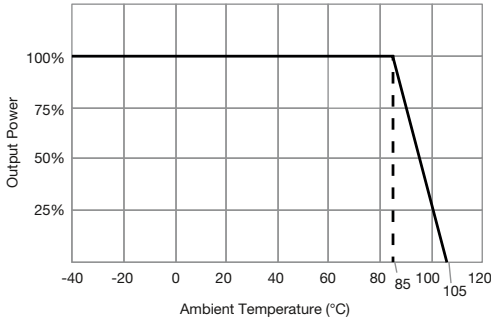
Derating Curve

STS1005



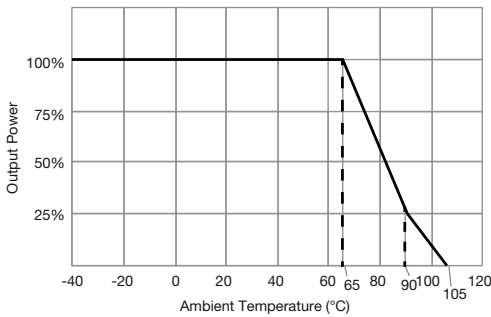
STS1024

$V_o = 1.8\text{ V}, 2.5\text{ V}, 3.3\text{ V}$ and 5 V

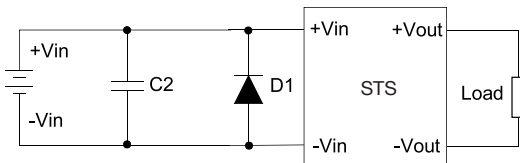


STS1024

$V_o = 12\text{ V}$ and 15 V



EFT & Surge

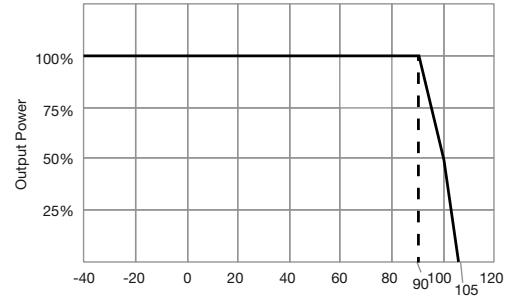


Suggested Filter : $5V_{in}$ models : Nippon - chemi - con KY series, $2200\text{ }\mu\text{F}/50\text{ V}$ and a TVS, 3 KW , 6.0 V $24V_{in}$ models : Nippon - chemi - con KY series, $330\text{ }\mu\text{F}/100\text{ V}$ and a TVS, $3\text{ KW}/36\text{ V}$

	C2	D1
5 V	$2200\text{ }\mu\text{F}, 50\text{ V}$	SMDJ 6.0 A
24 V	$330\text{ }\mu\text{F}, 100\text{ V}$	SMDF 36.0 A

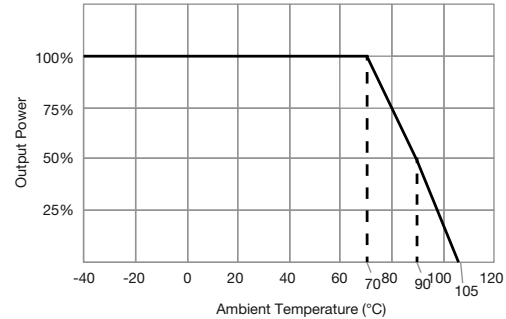
STS1024

$V_o = 1.2\text{ V}$ and 1.5 V

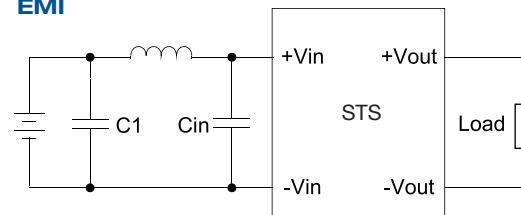


STS1024

$V_o = 6.5\text{ V}$ and 9 V



EMI

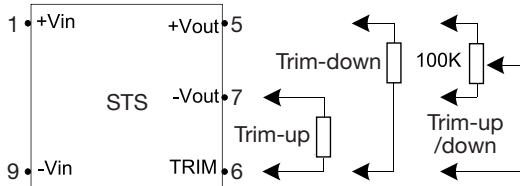


Input filter components (C_{in} , $C1$, $L1$) are used to help meet EMI requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.

	C1	L1	C_{in}
5 V	1206, $10\text{ }\mu\text{F}, 50\text{ V}$	$6.8\text{ }\mu\text{H}$	1206, $10\text{ }\mu\text{F}, 50\text{ V}$
24 V	1206, $4.7\text{ }\mu\text{F}, 50\text{ V}$	$33\text{ }\mu\text{H}$	1206, $10\text{ }\mu\text{F}, 50\text{ V}$

Application Notes

Output Voltage Adjustment



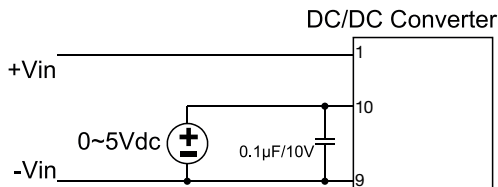
Pin 6 via a resistor to Pin 5 (+Vout), Vo trim down (Rd)
Pin 6 via a resistor to Pin 7 (-Vout), Vo trim up (Ru)

Model	STS1005S1V2		STS1005S1V5		STS1005S1V8		STS1005S2V5	
V out nominal	1V2		1V5		1V8		2V5	
Trim %	Rd*	Ru	Rd	Ru	Rd	Ru	Rd	Ru
1%	-	890	223	955	187	1000	372	1600
2%	-	440	103	475	87	499	172	792
3%	-	290	63	315	54	332	106	525
4%	-	215	43	235	37	249	72	393
5%	-	170	31	187	27	199	52	312
6%	-	140	23	155	20	166	40	260
7%	-	118	18	132	15	142	30	221
8%	-	102	13	115	12	124	22	193
9%	-	90	10	102	9	110	17	170
10%	-	80	7.3	91	7	100	12.5	153

Model	STS1024S1V2	STS1024S1V5	STS1024S1V8	STS1024S2V5	STS1024S3V3	STS1024S05	STS1024S6V5	STS1024S09	STS1024S12	STS1024S15
V out nominal	1V2	1V5	1V8	2V5	3V3	5	6V5	9	12	15
Trim %	Rd*	Ru	Rd	Ru	Rd	Ru	Rd	Ru	Rd	Ru
1%	-	668	152	1020	132	876	143	963	226	853
2%	-	319	69	514	61	432	71	444	105	424
3%	-	207	41	343	37	286	45	288	65	281
4%	-	152	28	257	25	214	31	213	45	210
5%	-	119	19	206	18	171	23	169	33	167
6%	-	98	14	171	13	142	18	140	25	138
7%	-	82	10	146	10	121	14	119	19	117
8%	-	70	7	128	7	106	10	104	15	103
9%	-	62	5	114	5	94	8	92	11	91
10%	-	54	3.2	103	3.6	85	6.3	83	8.5	81

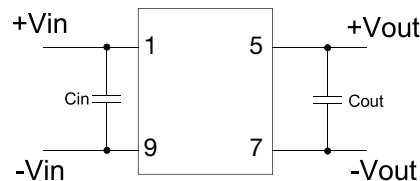
Note: Rd: Trim down. Ru: Trim up. Resistor values in kΩ
* 1V2 model only trim up

Remote On/Off



2-5 VDC or Open DC-DC ON
0-0.4 VDC or Short DC-DC OFF

Standard Application Circuit



Cin 10 µF must be fitted near DC-DC pins.
Optional Cout 47 µF