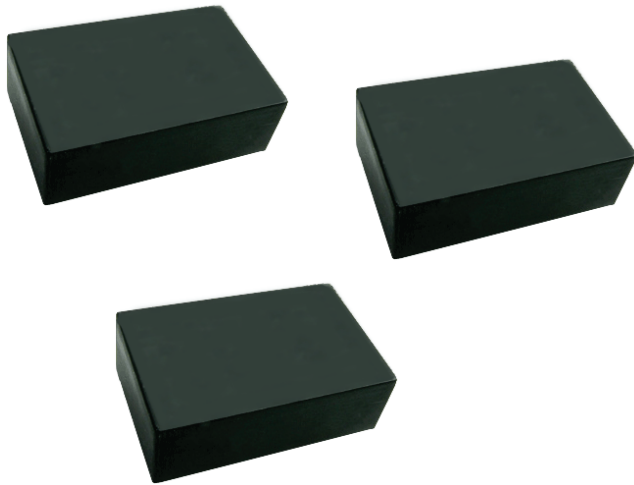


## DHSA020 SERIES:



### FEATURES:

- SINGLE IN LINE PACKAGE
- HIGH EFFICIENCY
- NO HEATSINK REQUIRED
- NO EXTERNAL COMPONENTS REQUIRED
- INTERNAL SMD TECHNOLOGY
- UL-94V0 PACKAGE MATERIAL
- RoHS COMPLIANT

### SPECIFICATION

#### INPUT SPECIFICATION

**Input Range:** +/-10% max. See Ratings Chart.  
**Input Current:** Various with input range and load.  
 See Ratings Chart.  
**Input Filter:** Capacitor Type.  
**Isolation Voltage:** 3000VDC min.  
**Isolation Resistance:**  $10^9$  ohm min.  
**Isolation Capacitance:** 80pF max.  
**EMI:** Meet Conducted and Radiated EN550022 Class A.

#### OUTPUT SPECIFICATION

**Output Voltage:** See Ratings Chart.  
**Output Current:** See Ratings Chart.  
**Voltage Setpoint Accuracy:**  $\pm 2.0\%$  max.  
**Line Regulation:**  $\pm 1.25\%$  max.  
**Load Regulation:**  $\pm 8\%$  max.  
**Minimum Load:** 10% of Full load.  
**Noise & Ripple (20MHz BW):** 100mVp-p max.  
**Short Circuit Protection:** Momentary.

#### GENERAL SPECIFICATION

**Efficiency:** 70-85% min. See Ratings Chart.  
**Switching Frequency:** 100KHz min  
**Transient Response:** 100uS max. at 25% step load change.  
**Case:** Non-Conductive Plastic.  
**Operating Temperature:** -40°C to +85°C.  
**Case Temperature:** +95°C max.  
**Storage Temperature:** -55°C to +125°C.  
**Cooling:** Free-Air convection.  
**Humidity:** 95% max.  
**MTBF:** >1,800,000 hours. MIL-HDBK-217F @25°C.

**NOTE:** (1) All measurements are at nominal line, full load, and +25°C unless otherwise specified.  
 (2) Ripple & Noise: Measured with 1uF ceramic capacitor connected to the output pins.  
 (3) Line Regulation is for a 1.0% change in input Voltage.  
 (4) Load Regulation is for output load current change from 20% to 100%.  
 (5) 3000VDC for 3 seconds.  
 (6) Due to requests in market and advances in technology, specifications subject to change without notice.

## DHSA020 SERIES:

### SINGLE OUTPUT

MODEL NO.	INPUT Vdc	INPUT CURRENT		OUTPUT VO1(Vdc)	OUTPUT VO1(mA)	EFF(%)	Isolation (VDC)	Package
		N. L. (mA)	F.L.					
DHSA020-05A-S050400	5	60	520	5	400	77	3000	D
DHSA020-05A-S120167	5	60	500	12	167	80	3000	D
DHSA020-05A-S150133	5	60	492	15	133	81	3000	D
DHSA020-12A-S050400	12	15	210	5	400	79	3000	D
DHSA020-12A-S120167	12	15	205	12	167	81	3000	D
DHSA020-12A-S150133	12	15	200	15	133	83	3000	D
DHSA020-24A-S050400	24	15	108	5	400	77	3000	D
DHSA020-24A-S120167	24	15	104	12	167	80	3000	D
DHSA020-24A-S150133	24	15	102	15	133	82	3000	D

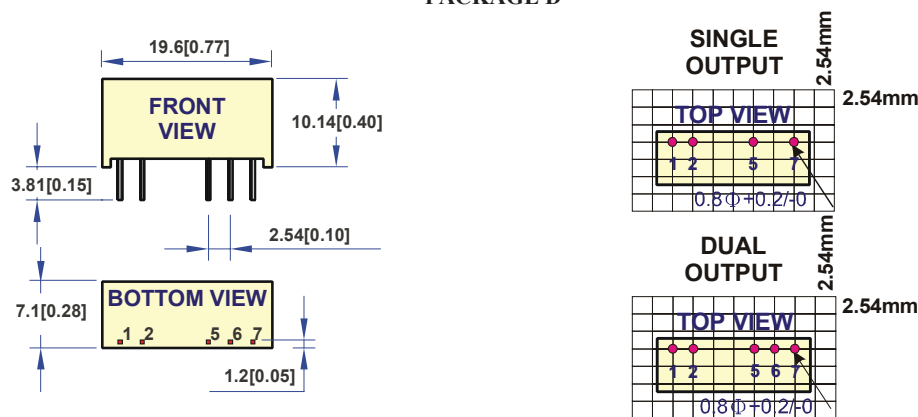
### DUAL OUTPUT

MODEL NO.	INPUT Vdc	INPUT CURRENT		OUTPUT (Vdc)		OUTPUT (mA)		EFF (%)	Isolation (VDC)	Package
		N. L. (mA)	F.L.	+VO1	-VO2	+VO1	-VO2			
DHSA020-05A-D050E	5	60	520	+5	-5	+200	-200	77	3000	D
DHSA020-05A-D120I	5	60	500	+12	-12	+84	-84	80	3000	D
DHSA020-05A-D150K	5	60	488	+15	-15	+67	-67	82	3000	D
DHSA020-05A-D240M	5	60	504	+24	-24	+42	-42	79	3000	D
DHSA020-12A-D050E	12	15	214	+5	-5	+200	-200	78	3000	D
DHSA020-12A-D120I	12	15	203	+12	-12	+84	-84	82	3000	D
DHSA020-12A-D150K	12	15	200	+15	-15	+67	-67	83	3000	D
DHSA020-24A-D050E	24	15	107	+5	-5	+200	-200	78	3000	D
DHSA020-24A-D120I	24	15	103	+12	-12	+84	-84	81	3000	D
DHSA020-24A-D150K	24	15	102	+15	-15	+67	-67	82	3000	D

MECHANICAL DIMENSIONS: MM [INCHES]

WEIGHT: 2.3g

#### PACKAGE D

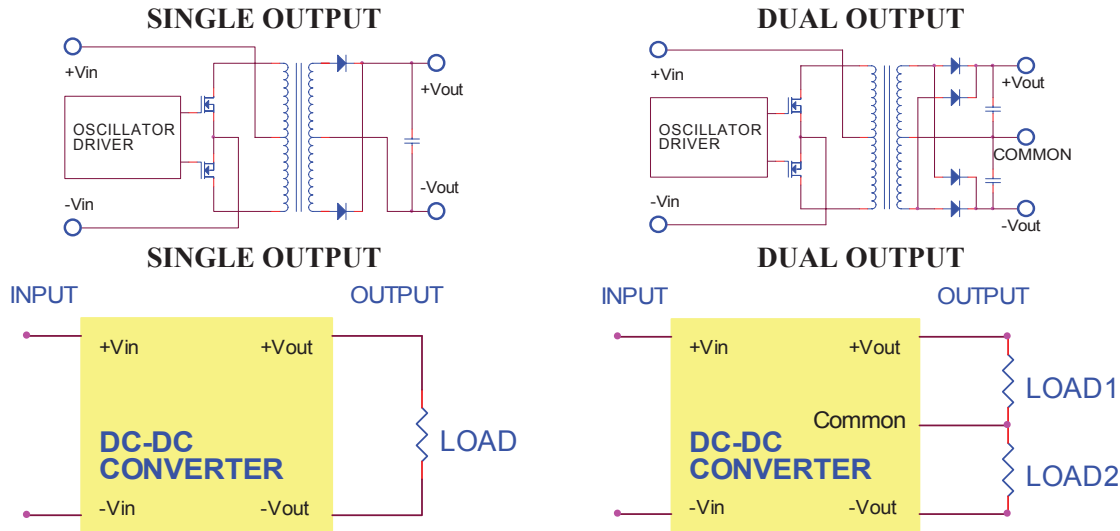


#### PIN ASSIGNMENT

PIN NO.	1	2	5	6	7
SINGLE	+Vin	-Vin	-Vout	NP	+Vout
DUAL	+Vin	-Vin	-Vout	COMMON	+Vout

## DHSA020 SERIES:

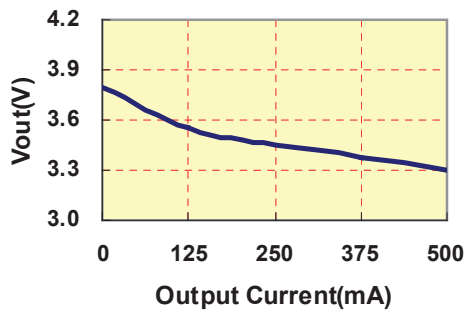
### SIMPLIFIED SCHEMATIC AND TYPICAL APPLICATIONS



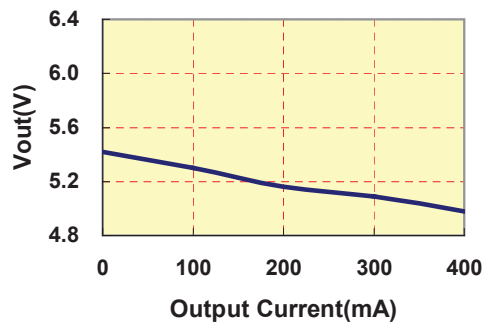
### TYPICAL PERFORMANCE CURVES

Specifications typical at  $T_a=25^{\circ}\text{C}$ , nominal input voltage, rated output current unless otherwise specified.

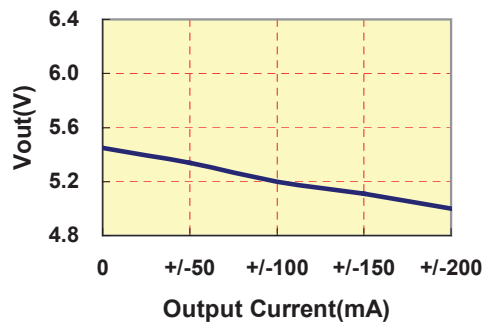
**VOUT VS LOAD(3.3Vout Models)**



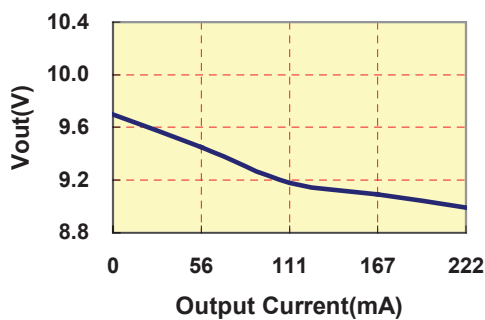
**VOUT VS LOAD(5Vout Models)**



**VOUT VS LOAD(+/-5Vout Models)**

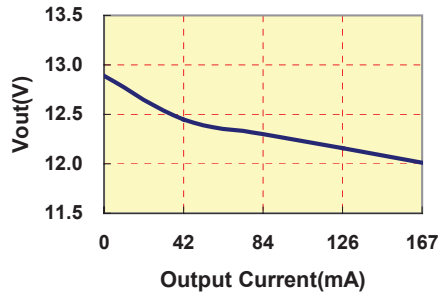


**VOUT VS LOAD(9Vout Models)**

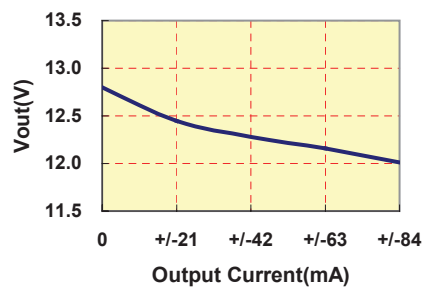


## DHSA020 SERIES:

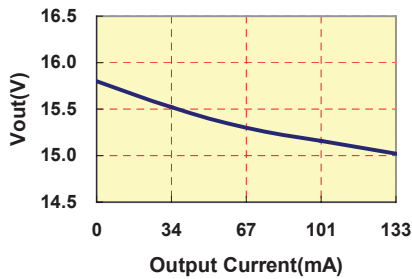
**VOUT VS LOAD(12Vout Models)**



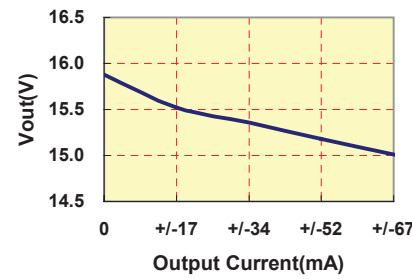
**VOUT VS LOAD(+/- 12Vout Models)**



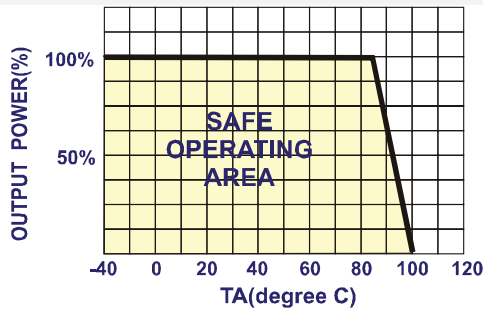
**VOUT VS LOAD(15Vout Models)**



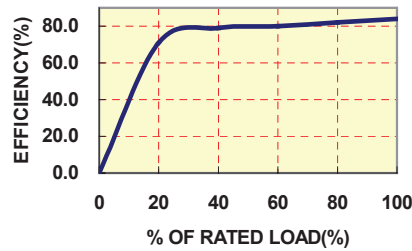
**VOUT VS LOAD(+/- 15Vout Models)**



**DERATING CURVE**



**EFFICIENCY VS LOAD**



### INPUT FUSE SELECTION GUIDE

2.97-3.63V INPUT VOLTAGE (VDC)	4.5-5.5V INPUT VOLTAGE (VDC)	10.8-13.2V INPUT VOLTAGE (VDC)	21.6-26.4V INPUT VOLTAGE (VDC)
1200mA Slow-Blow Type	800mA Slow-Blow Type	300mA Slow-Blow Type	170mA Slow-Blow Type



Note: (1) Certain applications may require the installation of external fuse in front of the input.

(2) Output filtering is required for operation. A minimum of 10uF is needed. Output capacitance may be increased for additional filtering, not to exceed 220uF. To meet the reflected ripple requirements of the converter, an input impedance of less than 0.5ohm from DC to 250KHz is required. We Can Offer EMC-Filter According To EN55011/22 Class B.

(3) Negative Outputs: A negative output voltage may be obtained by connecting the +OUT to circuit ground and connecting -OUT as the negative output.