



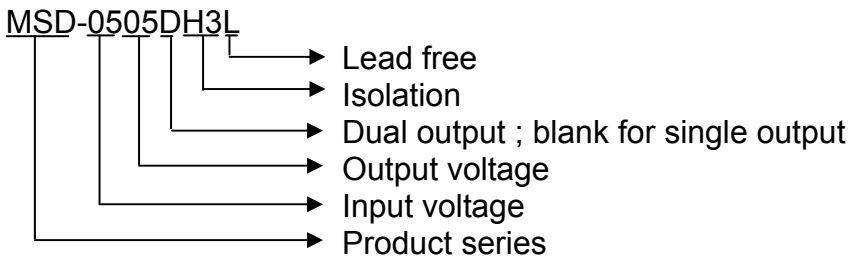
1W SMT DC/DC CONVERTERS

SERIES	DESCRIPTION	Page
MSD	SMT package Unregulated Single and Dual outputs 1kv isolation; 3kv option -40 to +85 operating temp V in 3.3V, 5V, 12V, 15V & 24V 85% efficient EN60950 & EN60601 certified	2
MSD1R	SMT package Regulated Single output 1kv isolation; 3kv option -40 to +85 operating temp V in 3.3V, 5V, 12V, 15V & 24V 85% efficient EN60950 & EN60601 certified	7

Features:

- 1 : 1 Input Range.
- 1W SMD Package.
- Efficiency up to 85% .
- UL94V-0 Package Material.
- 1KVDC and 3KVDC Isolation Option.
- Operating Temperature Range From - 40°C to +85°C.
- EN60950 certified.
- EN60601 certified.

MODEL SELECTION



Selection Guide				
P/N	Input Voltage	Output Voltage	Output Current	Efficiency Typ.
MSD-xx3.3(H3)L	3.3 ~24VDC	3.3VDC	303mA	75%
MSD-xx05(H3)L		5 VDC	200mA	72-78%
MSD-xx09(H3)L		9 VDC	111mA	74-78%
MSD-xx12(H3)L		12 VDC	84mA	75-80%
MSD-xx15(H3)L		15 VDC	66mA	74-84%
MSD-xx3.3D(H3)L	3.3 ~24VDC	±3.3 VDC	±150mA	75%
MSD-xx05D(H3)L		±5 VDC	±100mA	72-78%
MSD-xx09D(H3)L		±9 VDC	±56mA	74-78%
MSD-xx12D(H3)L		±12 VDC	±44mA	75-80%
MSD-xx15D(H3)L		±15 VDC	±33mA	74-84%

Note :

1. xx=Input voltage .
2. Add suffix "P" for continuous short circuit protection .
3. Add suffix "H" for isolation 3KVdc/1sec .
4. Add suffix "R" for tape and reel packing .
5. Reflow temperature ROHS compliant 240°C max./10~30sec.

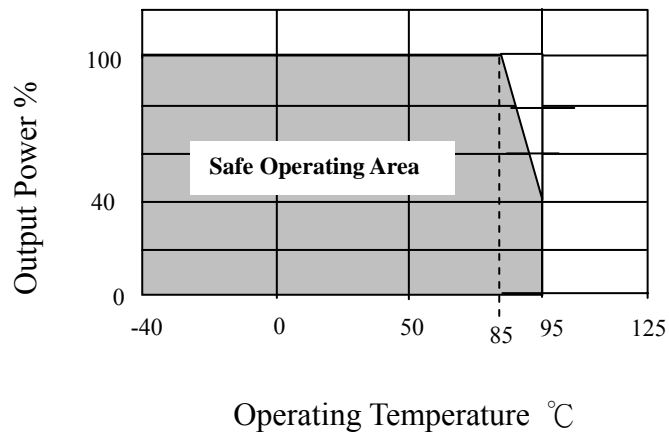
Electrical Specifications
(measured at T_A =25°C, at nominal input voltage and rated output current unless otherwise specified)

		MIN.	TYP.	MAX.
Input voltage range				±10%
Voltage set accuracy			-1.0%	±5%
Line Regulation	Low line to High line @Max. load		1.0%	1.2%
Load Regulation	10% ~ 100% load(3.3/5Voutput)		12%	15%
	10% ~ 100% load(9V output)		7%	10%
	10% ~ 100% load(12V output)		6%	10%
	10% ~ 100% load(15V output)		6%	10%
Ripple & Noise @ 20MHz BW			50 mVp-p	100mVp-p
Operating Temperature		-40°C		+85°C
Storage Temperature		-50°C		+125°C
Isolation Test Voltage	MSD-xxxx(D)L	1KVdc		
	MSD-xxxx(D)H3L	3KVdc		
Isolation Capacitance		10pF		75pF
Isolation Resistance	Viso=500V	10GΩ		
Humidity				95%
Operating Frequency	Vin = Nominal Input	20 KHz	50KHz	100 KHz
Short-Circuit Protection	1 sec.			
MTBF	Using MIL-HDBK 217F	+85°C	183K hours	
		+25°C	1045K hours	

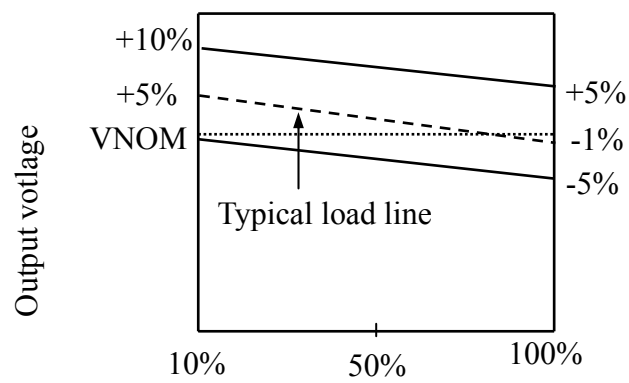
Physical Specifications

Weight	Single types : 1.0g
	Dual types : 1.2g

Derating-Graph (Ambient Temperature)

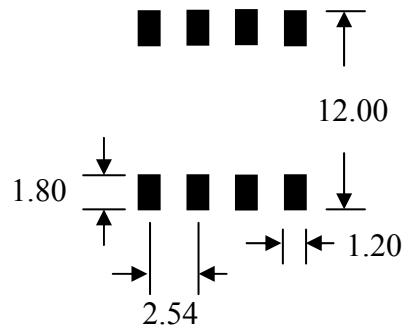
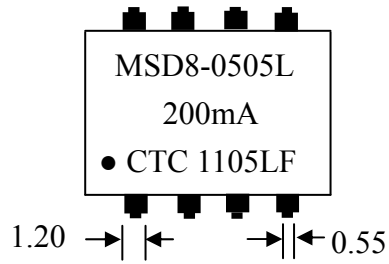
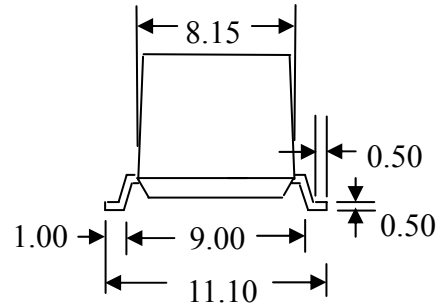
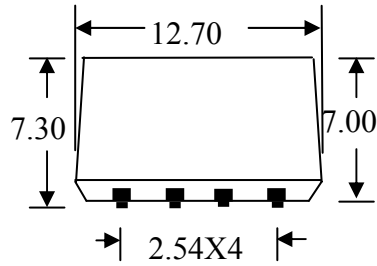


Tolerance Envelopes

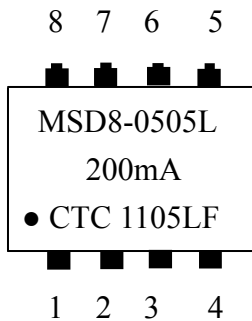


+Vout and - Vout load current (%)

Outline Dimensions



Footprint



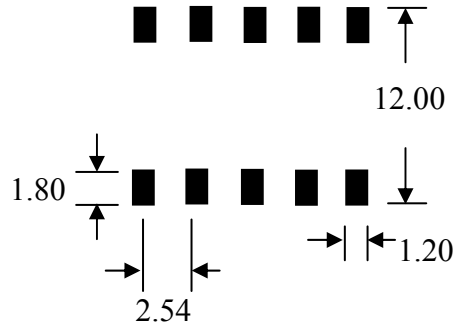
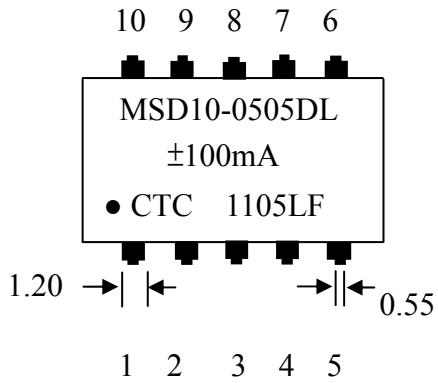
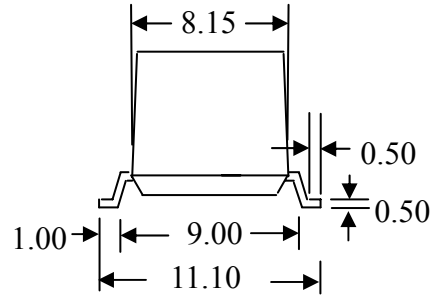
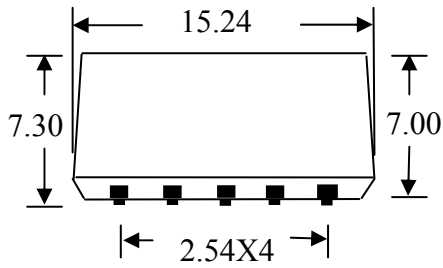
PIN	FUNCTION For 5PINS	FUNCTION For 8PINS
1	-Vin	-Vin
2	+Vin	+Vin
4	-Vout	-Vout
5	+Vout	+Vout
8	NC	NC
3,6,7	NA	NC

NC- No internal electrical connection.
 NA- Not available electrical connection.

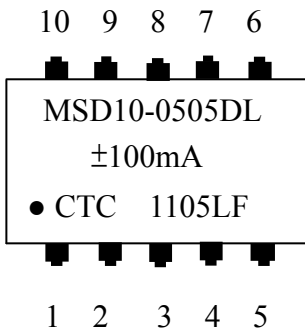
UNIT : mm

TOL. : ± 0.25 mm

Outline Dimensions



Footprint



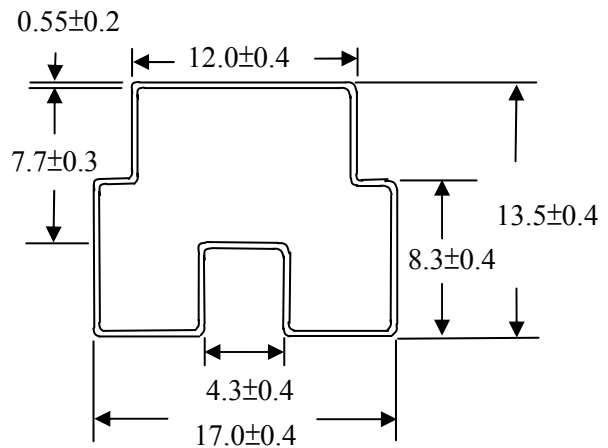
PIN	FUNCTION For 6PINS	FUNCTION For 10PINS
1	-Vin	-Vin
2	+Vin	+Vin
4	Com.	Com.
5	-Vout	-Vout
7	+Vout	+Vout
10	NC	NC
3,6,8,9	NA	NC

NC- No internal electrical connection.
 NA- Not available electrical connection.

UNIT : mm
 TOL. : ±0.25mm

Tube Outline Dimensions

TUBE LENGTH = 530mm±2.0mm



External Capacitor Table

Vin	External Capacitor	Vout	External Capacitor
3.3VDC	22 μ f max.	3.3VDC	33 μ f max.
5VDC	22 μ f max.	5VDC	33 μ f max.
12VDC	10 μ f max.	12VDC	22 μ f max.
15VDC	4.7 μ f max.	15VDC	10 μ f max.
24VDC	2.2 μ f max.	-----	-----

Vin	External Capacitor	Vout	External Capacitor
3.3VDC	10 μ f max.	±3.3VDC	10 μ f max.
5VDC	10 μ f max.	±5VDC	10 μ f max.
12VDC	6.8 μ f max.	±12VDC	6.8 μ f max.
15VDC	4.7 μ f max.	±15VDC	4.7 μ f max.
24VDC	2.2 μ f max.	-----	-----

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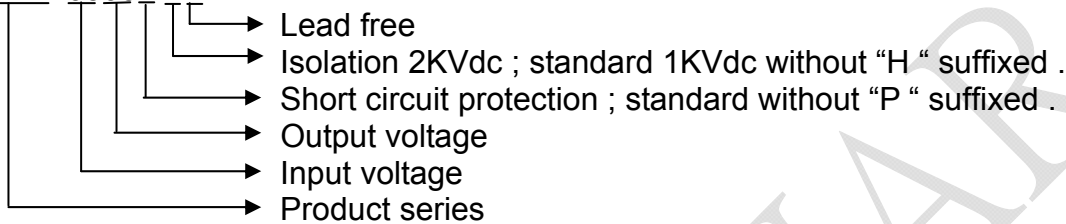
Features:

- 1 : 1 Input Range.
- 1W SMD Package.
- Efficiency up to % .
- UL94V-0 Package Material.
- 1KVDC and 2KVDC Isolation Option.
- Operating Temperature Range From - 40°C to +71°C.
- EN60950 (pending)
- EN60601(pending)



MODEL SELECTION

MSD1R-0505PHL



Selection Guide

P/N	Input Voltage	Output Voltage	Output Current	Efficiency Typ.
MSD1R-xx03L	3.3 ~24VDC	3VDC	330mA	
MSD1R -xx3.3L		3.3VDC	303mA	
MSD1R -xx05L		5 VDC	200mA	
MSD1R -xx09L		9 VDC	111mA	
MSD1R -xx12L		12 VDC	84mA	
MSD1R -xx15L		15 VDC	66mA	
MSD1R -xx03PL		3VDC	330mA	
MSD1R -xx3.3PL		3.3VDC	303mA	
MSD1R -xx05PL		5 VDC	200mA	
MSD1R -xx09PL		9 VDC	111mA	
MSD1R -xx12PL		12 VDC	84mA	
MSD1R -xx15PL		15 VDC	66mA	

Note :

1. xx=Input voltage .
2. Add suffix "P" for continuous short circuit protection .
3. Add suffix "H" for isolation 3KVdc/1sec .
4. Add suffix "R" for tape and reel packing .
5. Reflow temperature ROHS compliant 245°C max./10~30sec.

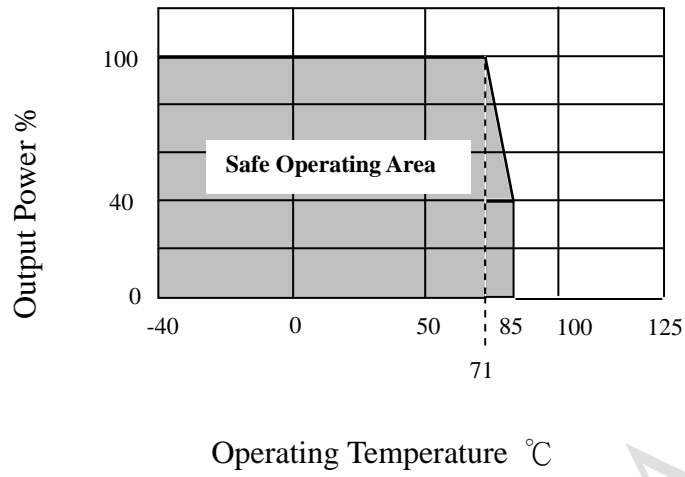
Electrical Specifications
(measured at $T_A = 25^\circ\text{C}$, at nominal input voltage and rated output current unless otherwise specified)

		MIN.	TYP.	MAX.
Input voltage range				$\pm 5\%$
Voltage set accuracy				$\pm 2\%$
Line Regulation	Low line to High line @Max. load			1.0%
Load Regulation	0% ~ 100% load			1.0%
Efficiency	100% load	50%	60%	
Ripple & Noise @ 20MHz BW				100mVp-p
Operating Temperature		-40°C		$+71^\circ\text{C}$
Storage Temperature		-50°C		$+125^\circ\text{C}$
Isolation Test Voltage H-Suffix	Tested for 1 second	1KVdc 2KVdc		
Isolation Capacitance				115pF
Isolation Resistance	Viso=500V	10G Ω		
Humidity				95%
Operating Frequency	Vin = Nominal Input	20 KHz	40KHz	80 KHz
Short-Circuit Protection P-Suffix		1 sec. Continuous		
MTBF MSD1R types	Using MIL-HDBK 217F	$+71^\circ\text{C}$	149K hours	
		$+25^\circ\text{C}$	1210K hours	
MSD1R/P types		$+71^\circ\text{C}$	418K hours	
		$+25^\circ\text{C}$	1688K hours	

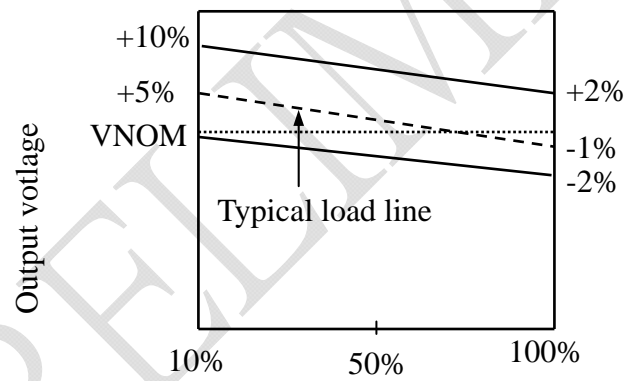
Physical Specifications

Weight	1.6g
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Derating-Graph (Ambient Temperature)

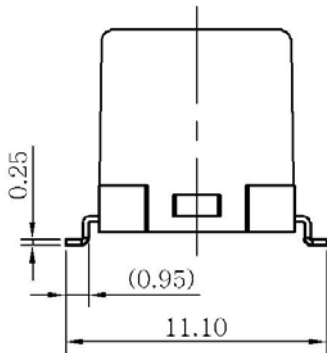
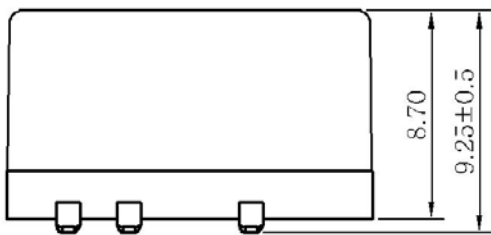
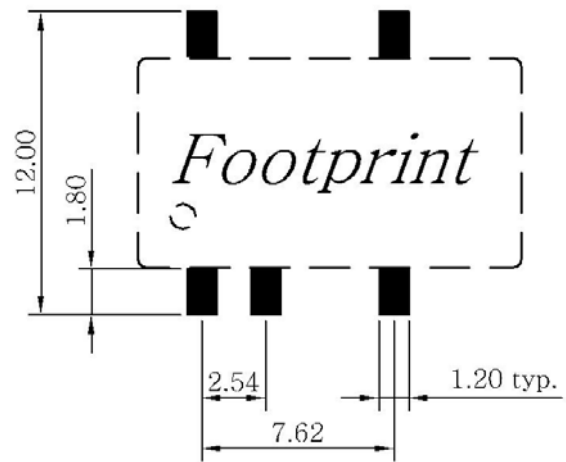
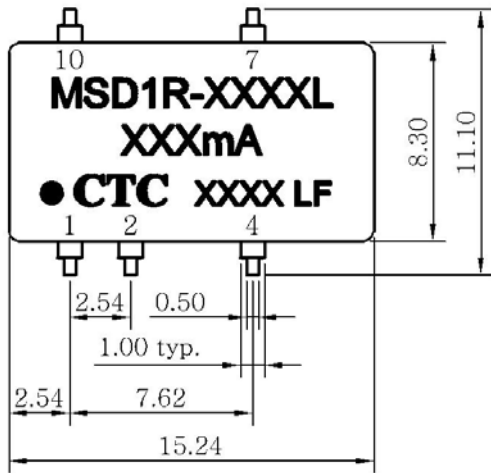


Tolerance Envelopes



+Vout and -Vout load current (%)

Outline Dimensions



PIN	FUNCTION DUAL
1	-Vin
2	+Vin
4	-Vout
7	+Vout
10	NC

NC- No internal electrical connection.

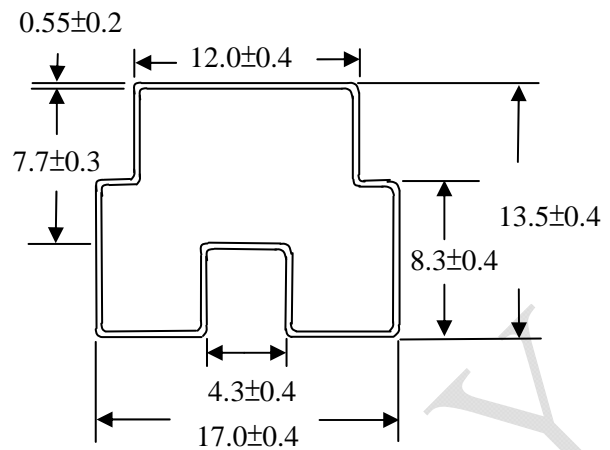
UNIT : mm

TOL. : XX.X ±0.5mm

XX.XX ±0.25mm

Pins ±0.05mm

Tube Outline Dimensions



TUBE LENGTH = 530mm±2.0mm

External Capacitor Table

Vin	External Capacitor	Vout	External Capacitor
3/3.3VDC	33 μ f max.	3.3VDC	47 μ f max.
5VDC	33 μ f max.	5VDC	33 μ f max.
12VDC	22 μ f max.	12VDC	22 μ f max.
15VDC	10 μ f max.	15VDC	10 μ f max.
24VDC	4.7 μ f max.	---	---

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