Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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TDK·Lambda

PXB15-xxDxx

Dual Output 15 Watt DC/DC Converters

The PXB15 series is approved to UL/CSA/EN/IEC 60950-1.

Table of contents

Absolute Maximum Rating				
Parameter	**Model**	**Min**	**Max**	**Unit**
Input Voltage				
Continuous	12DXX		18	
	24DXX		36	
	48DXX		75	V_{DC}
Transient (100mS)	12DXX		36	
	24DXX		50	
	48DXX		100	
Input Voltage Variation (complies with ETS300 132 part 4.4)	All		5	V/mS
Operating Ambient Temperature (with derating)	All	-40	85	ºC
Operating Case Temperature			105	ºC
Storage Temperature	All	-55	125	ºC

Output Specification					
Parameter	**Model**	**Min**	**Typ**	**Max**	**Unit**
Output Voltage Range	XXD05	4.95	5	5.05	
(Vin = Vin(nom) ; Full Load ; T_A=25 ºC)	XXD12	11.88	12	12.12	V_{DC}
	XXD15	14.85	15	15.15	
Output Regulation					
Line (Vin(min) to Vin(max) at Full Load)	All	-0.5		+0.5	%
Load (0% to 100% of Full Load)		-1.0		+1.0	
Cross Regulation Asymmetrical Load 25% / 100% of Full Load	All	-5		5	%
Output Ripple & Noise(See Page 23) Peak-to-Peak (20MHz bandwidth) (Measured with a 1uF M/C and a 10uF T/C)	All		100		mV_{P-P}
Temperature Coefficient	All	-0.02		+0.02	%/ ºC
Output Voltage Overshoot (Vin(min) to Vin(max) ; Full Load ; T_A=25 ºC)	All		0	3	% V_{OUT}
Dynamic Load Response (Vin = Vin(nom) ; T_A=25 ºC) Load step change from 75% to 100% or 100 to 75% of Full Load Peak Deviation	All		200		mV
Settling Time (V_{OUT}□10% peak deviation)	All		250		µS
Output Current	XXD05	0		±1500	
	XXD12	0		±625	mA
	XXD15	0		±500	
Output Over Voltage Protection	XXD05	5.6		7.0	
(Voltage Clamped)	XXD12	13.5		19.6	V_{DC}
	XXD15	16.8		20.5	
Output Over Current Protection	All		150		% FL.
Output Short Circuit Protection	All	Hiccup, automatic recovery			

Input Specification					
Parameter	**Model**	**Min**	**Typ**	**Max**	**Unit**
Operating Input Voltage	12DXX	9	12	18	
	24DXX	18	24	36	V_{DC}
	48DXX	36	48	75	
Input Current	12D05			1543	
(Maximum value at Vin = Vin(nom); Full Load)	12D12			1506	
	12D15			1488	
	24D05			772	
	24D12			744	mA
	24D15			744	
	48D05			386	
	48D12			368	
	48D15			372	
Input Standby Current	12D05		30		
(Typical value at Vin = Vin(nom) ; No Load)	12D12		30		
	12D15		30		
	24D05		20		
	24D12		15		mA
	24D15		25		
	48D05		15		
	48D12		15		
	48D15		20		
Under Voltage Lockout Turn-on Threshold	12DXX			9	
	24DXX			18	V_{DC}
	48DXX			36	
Under Voltage Lockout Turn-off Threshold	12DXX		8		
	24DXX		14.5		V_{DC}
	48DXX		30.5		
Input Reflected Ripple Current (See Page 23)					
(5 to 20MHz, 12µH source impedance)	All		30		mA_{P-P}
Start Up Time					
(Vin = Vin(nom) and constant resistive load)					
Power up	All		30		mS
Remote ON/OFF			30		
Remote ON/OFF Control (See Page 28)					
(The ON/OFF pin voltage is referenced to -V_{IN})					
Negative Logic DC-DC ON(Short)	All	0		1.2	
DC-DC OFF(Open)		3		15	
Positive Logic DC-DC ON(Open)		3		15	V_{DC}
DC-DC OFF(Short)		0		1.2	
Remote Off Input Current	All		2.5		mA
Input Current of Remote Control Pin	All	-0.5		1.0	mA

General Specification					
Parameter	**Model**	**Min**	**Typ**	**Max**	**Unit**
Efficiency(See Page 23)	12D05		85		
(Vin = Vin(nom) ; Full Load ; T_A=25 ºC)	12D12		87		
	12D15		88		
	24D05		85		
	24D12		88		%
	24D15		88		
	48D05		85		
	48D12		89		
	48D15		88		
Isolation Voltage					
Input to Output	All	1600			V_{DC}
Input (Output) to Case		1000			
Isolation Resistance	All	1			GΩ
Isolation Capacitance	All			1000	pF
Switching Frequency	All		400		KHz
Weight	All		15		g
MTBF(See Page 32)					
Bellcore TR-NWT-000332, T_C=40 ºC	All		1.330×10^6		hours
MIL-STD-217F			5.630×10^5		

Characteristic Curves

All test conditions are at 25 ºC. PXB15-12D05
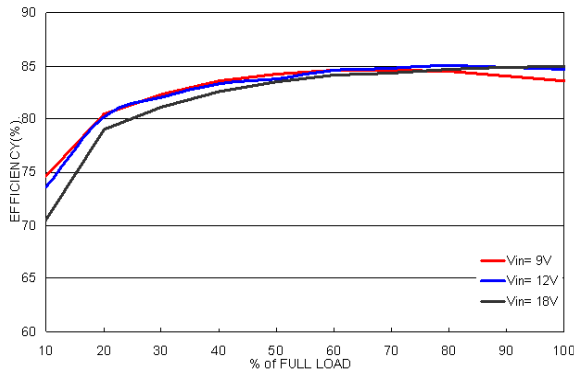
Efficiency versus Output Current
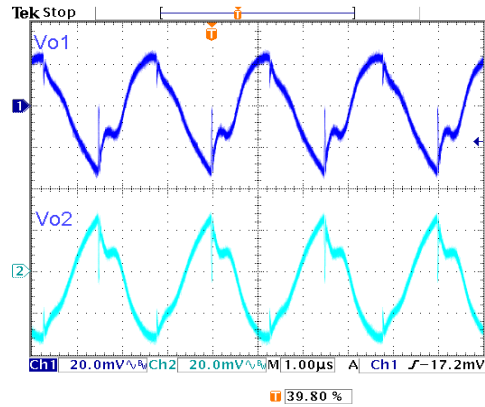
Typical Output Ripple and Noise.

Vin = Vin(nom) **; Full Load**

Efficiency versus Input Voltage. Full Load

Transient Response to Dynamic Load Change from

100% to 75% to 100% of Full Load ; Vin = Vin(nom)
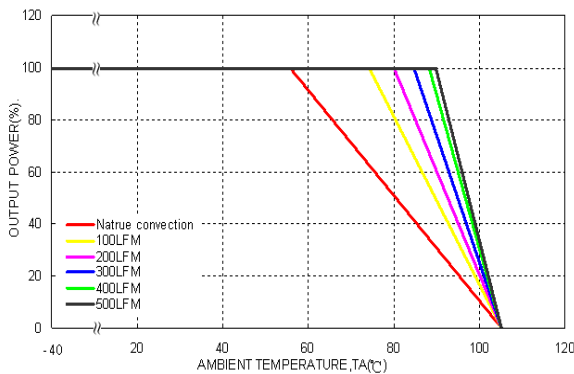
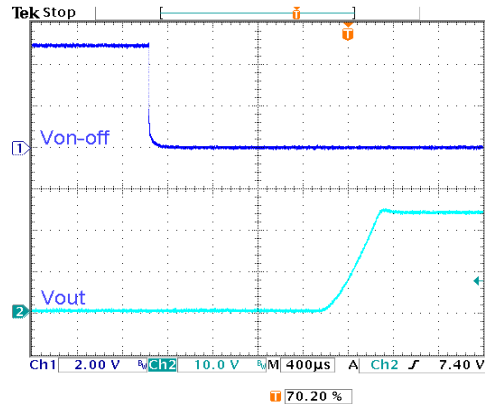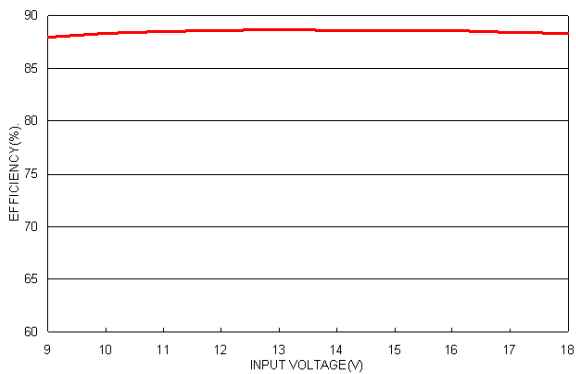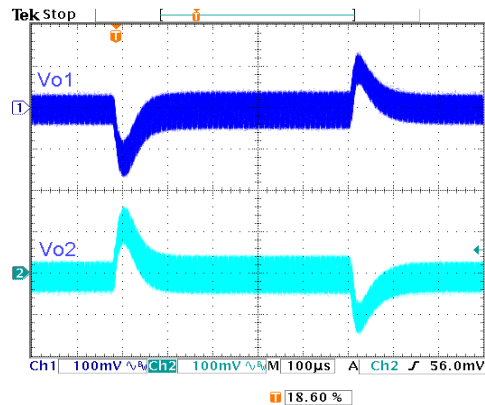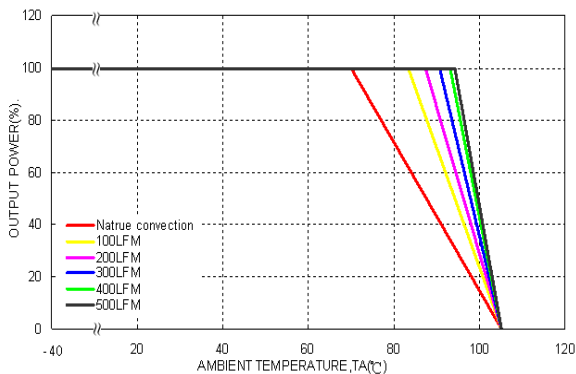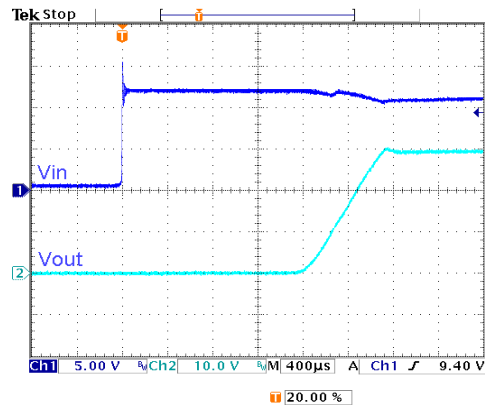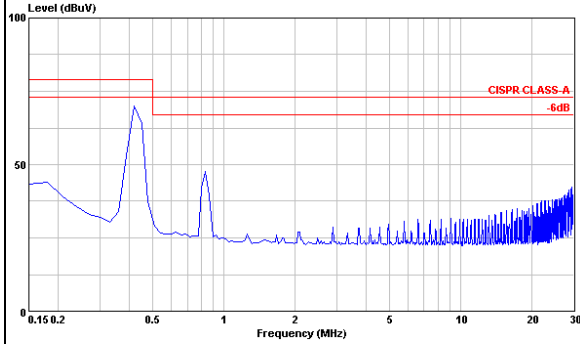**Derating Output Current versus Ambient Temperature and Airflow**
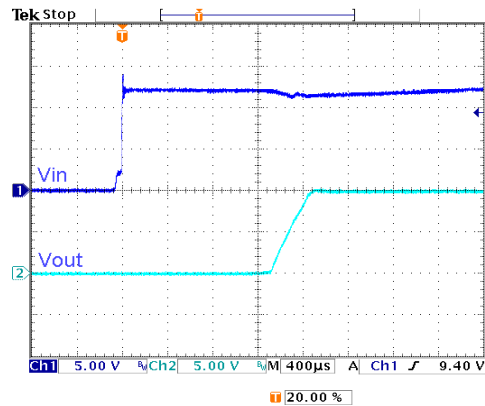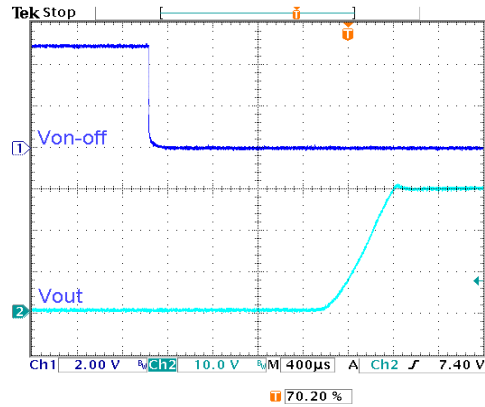
Vin = Vin(nom)

Typical Input Start-Up and Output Rise Characteristic

Vin = Vin(nom) **; Full Load**
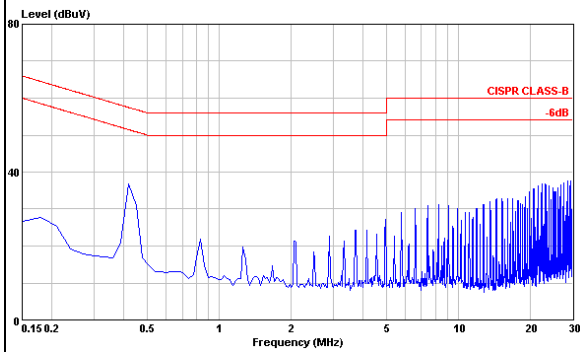
Characteristic Curves (Continued)
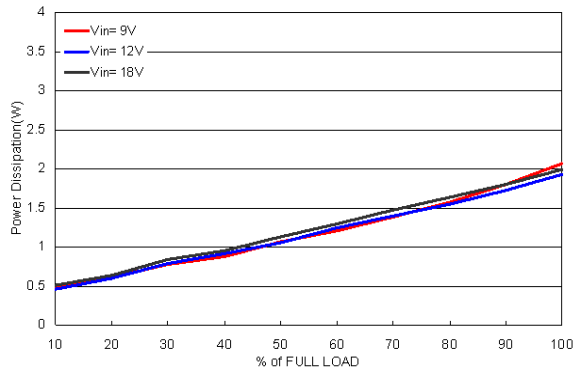
All test conditions are at 25 ºC. PXB15-12D05

Conduction Emission of EN55022 Class A
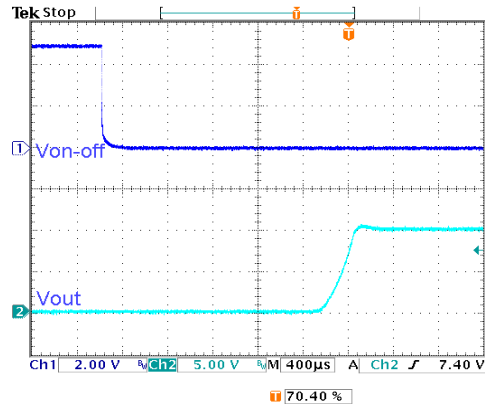
Vin = Vin(nom) **; Full Load**

Using ON/OFF Voltage Start-Up and Vo Rise Characteristic

Vin = Vin(nom) **; Full Load**
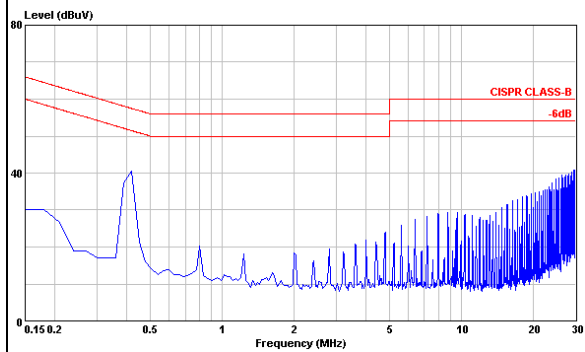
Conduction Emission of EN55022 Class B

Vin = Vin(nom) **; Full Load**
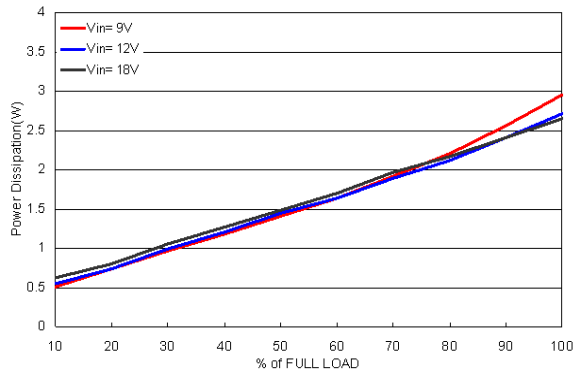
Power Dissipation versus Output Current
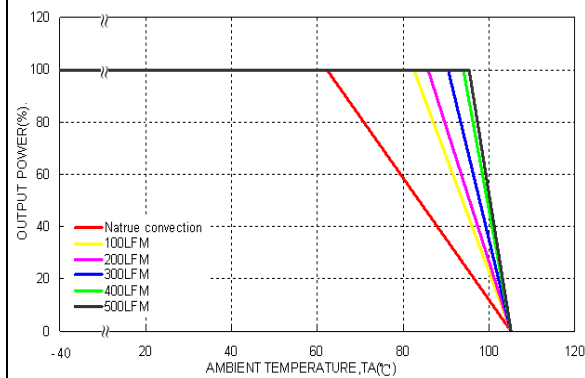
Derating Output Current Versus Ambient Temperature with Heat-Sink

and Airflow, Vin = Vin(nom)

Characteristic Curves (Continued)

All test conditions are at 25 ºC. PXB15-12D12

Efficiency versus Output Current
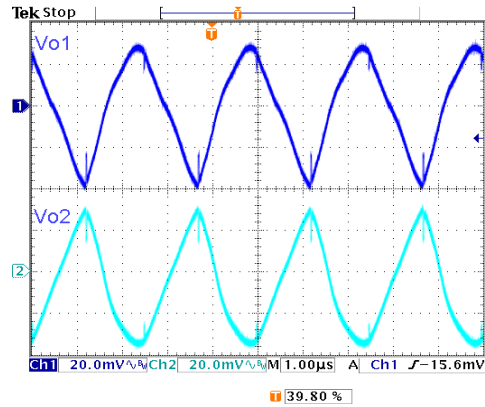
Typical Output Ripple and Noise.

Vin = Vin(nom) **; Full Load**

Efficiency versus Input Voltage. Full Load

Transient Response to Dynamic Load Change from

100% to 75% to 100% of Full Load ; Vin = Vin(nom)
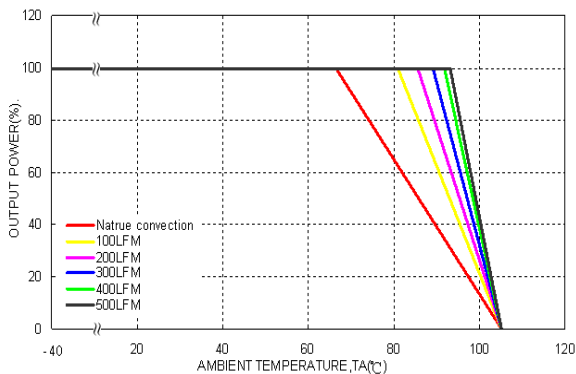
Derating Output Current versus Ambient Temperature and Airflow
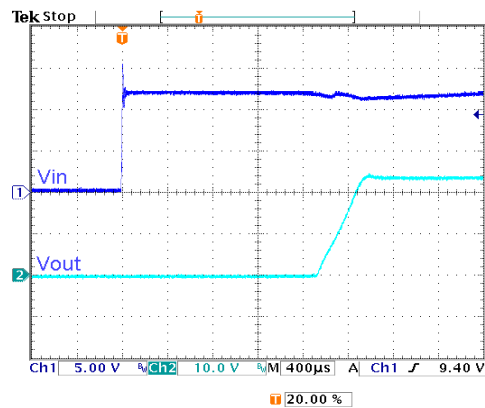
Vin = Vin(nom)

Typical Input Start-Up and Output Rise Characteristic

Vin = Vin(nom) **; Full Load**

Characteristic Curves (Continued)

All test conditions are at 25 ºC. PXB15-12D12

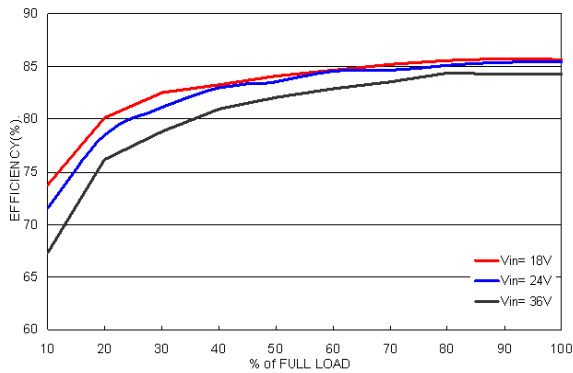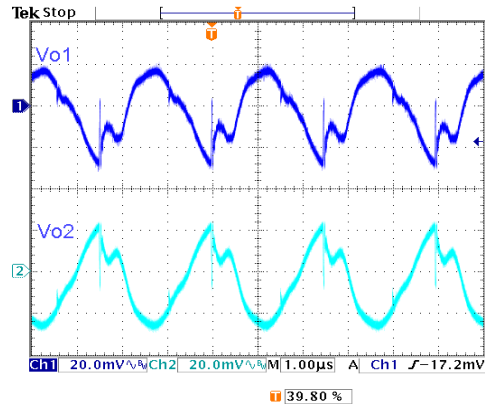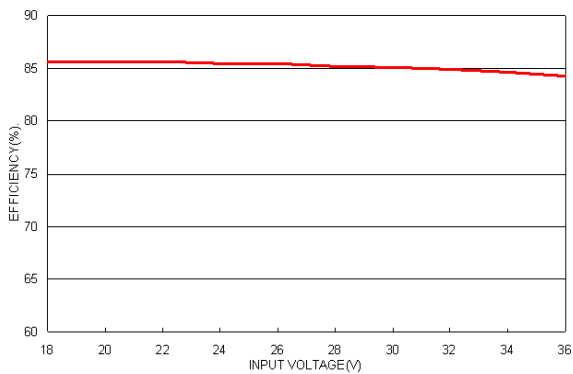**Conduction Emission of EN55022 Class A**

Vin = Vin(nom) ; **Full Load**

Using ON/OFF Voltage Start-Up and Vo Rise Characteristic

Vin = Vin(nom) ; **Full Load**
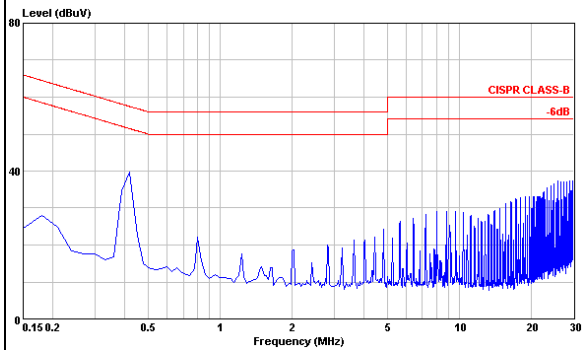
Conduction Emission of EN55022 Class B

Vin = Vin(nom) ; **Full Load**
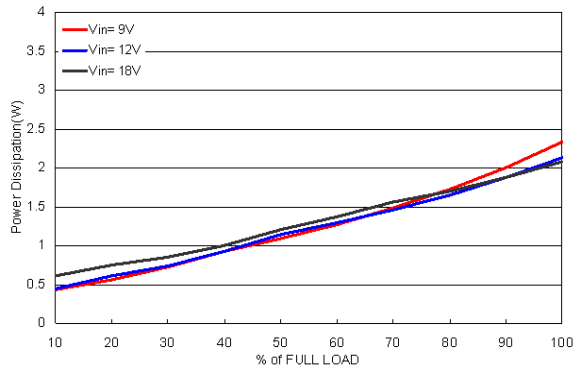
Power Dissipation versus Output Current
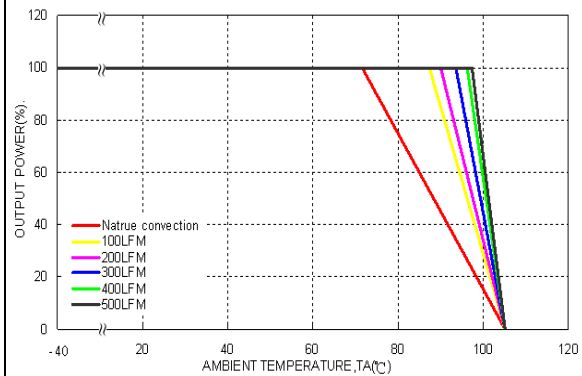
Derating Output Current Versus Ambient Temperature with Heat-Sink

and Airflow, Vin = Vin(nom)

Characteristic Curves (Continued)
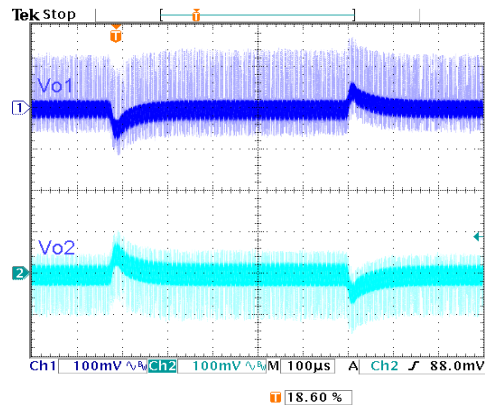
All test conditions are at 25 ºC. PXB15-12D15


Efficiency versus Output Current
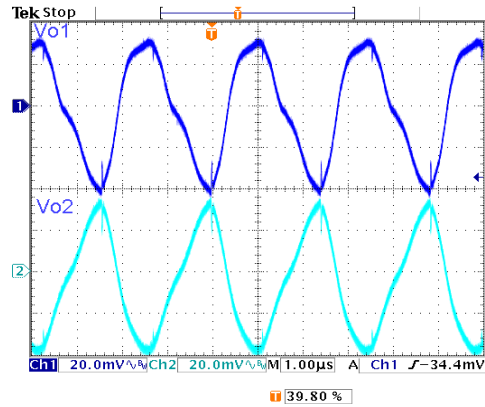
Typical Output Ripple and Noise.

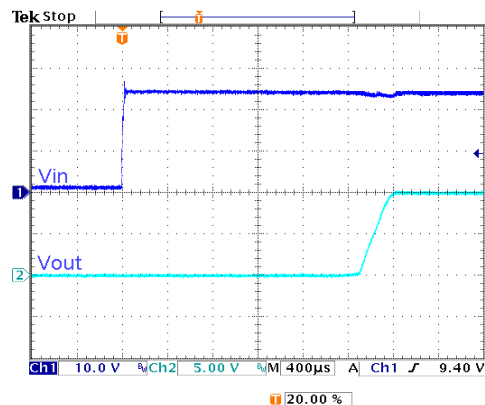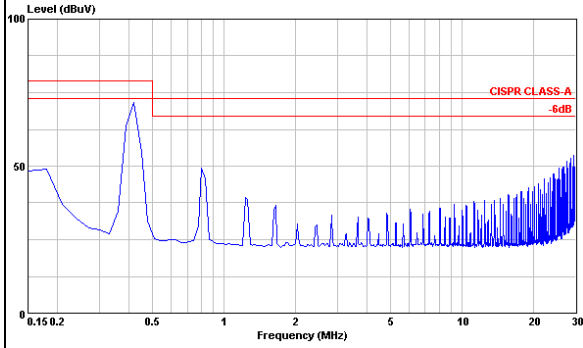Vin = Vin(nom) **; Full Load**

Efficiency versus Input Voltage. Full Load

Transient Response to Dynamic Load Change from

100% to 75% to 100% of Full Load ; Vin = Vin(nom)

Derating Output Current versus Ambient Temperature and Airflow
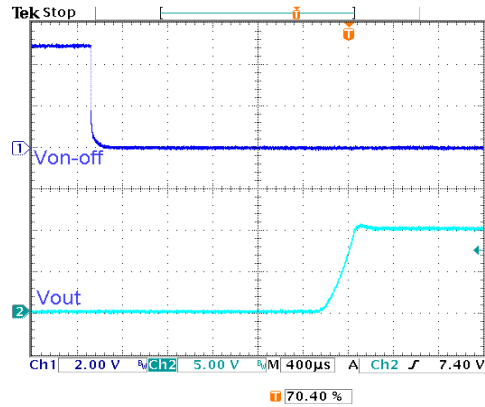
Vin = Vin(nom)

Typical Input Start-Up and Output Rise Characteristic

Vin = Vin(nom) **; Full Load**
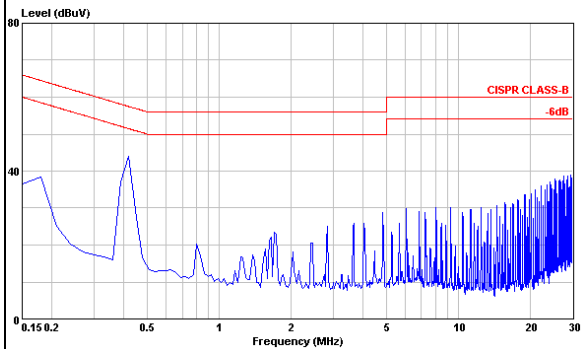
Characteristic Curves (Continued)
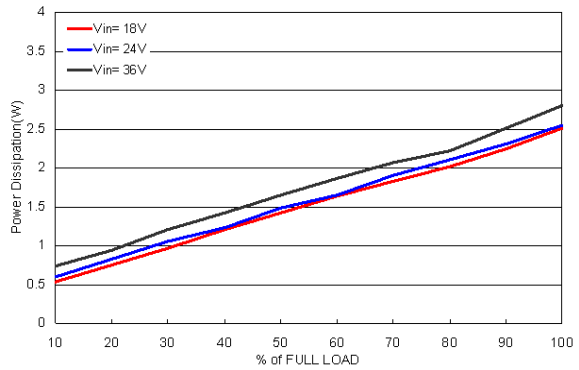
All test conditions are at 25 ºC. PXB15-12D15

**Conduction Emission of EN55022 Class A**

Vin = Vin(nom) **; Full Load**

Using ON/OFF Voltage Start-Up and Vo Rise Characteristic

Vin = Vin(nom) **; Full Load**

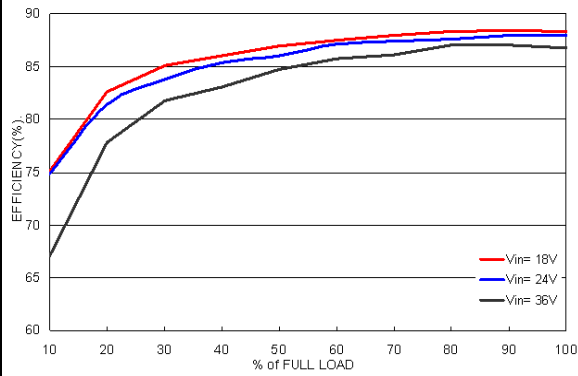**Conduction Emission of EN55022 Class B**

Vin = Vin(nom) **; Full Load**

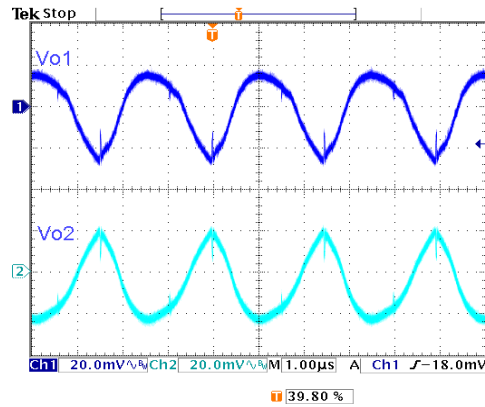**Power Dissipation versus Output Current**
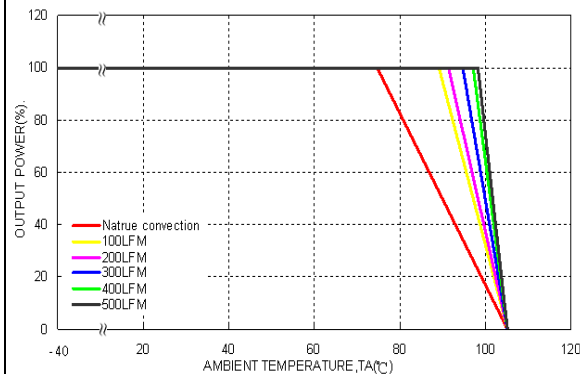
Derating Output Current Versus Ambient Temperature with Heat-Sink

and Airflow, Vin = Vin(nom)
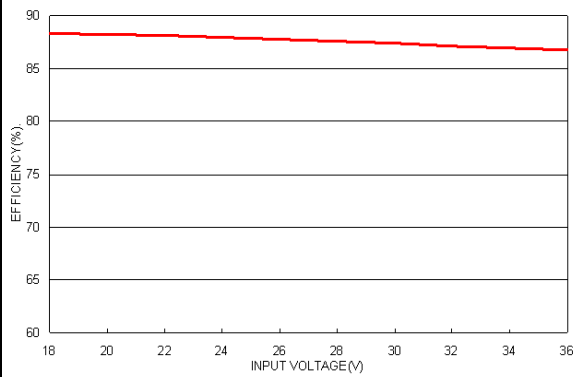
Characteristic Curves (Continued)
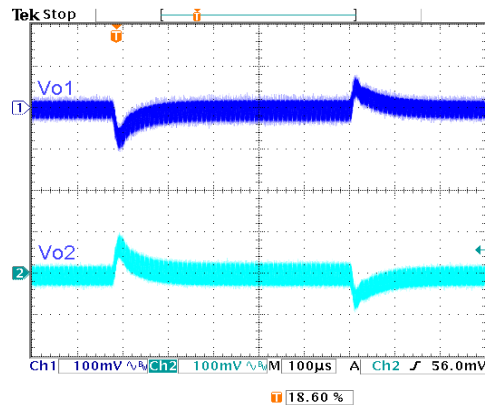
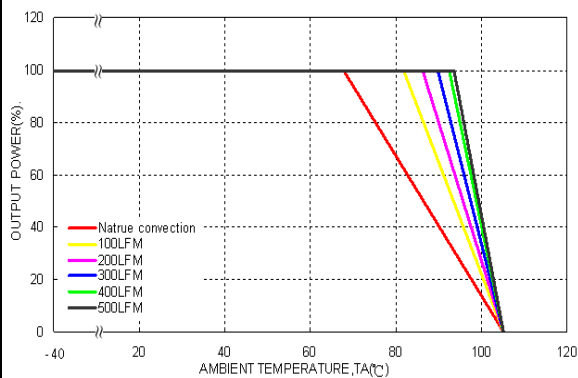All test conditions are at 25 ºC. PXB15-24D05

Efficiency versus Output Current

**Typical Output Ripple and Noise.**

Vin = Vin(nom) **; Full Load**

Efficiency versus Input Voltage. Full Load

Transient Response to Dynamic Load Change from

100% to 75% to 100% of Full Load ; Vin = Vin(nom)
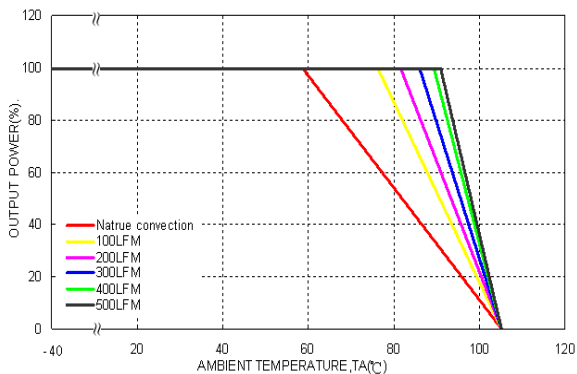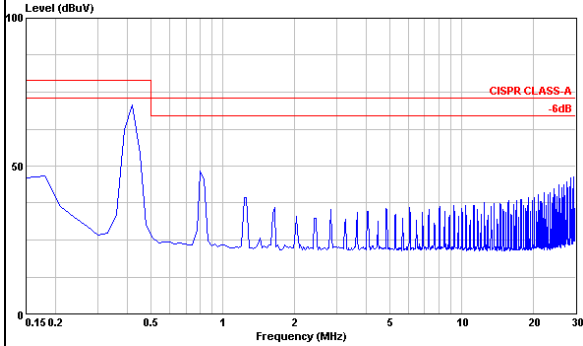
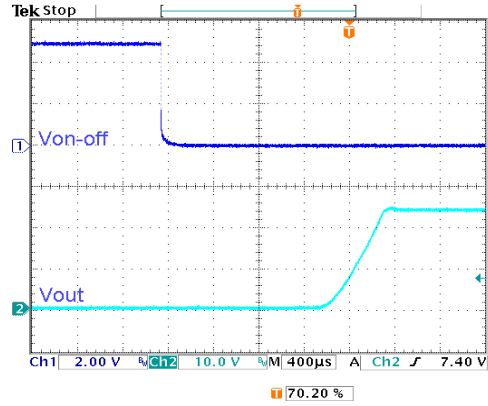**Derating Output Current versus Ambient Temperature and Airflow**

Vin = Vin(nom)

Typical Input Start-Up and Output Rise Characteristic

Vin = Vin(nom)**; Full Load**
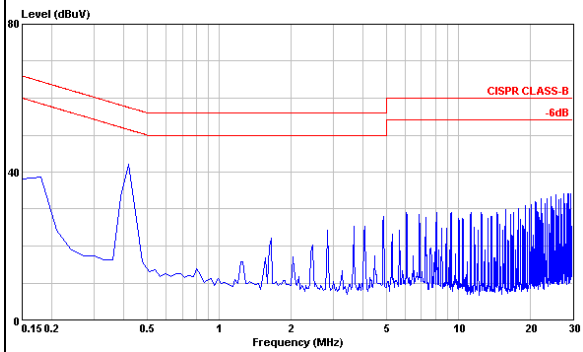
Characteristic Curves (Continued)
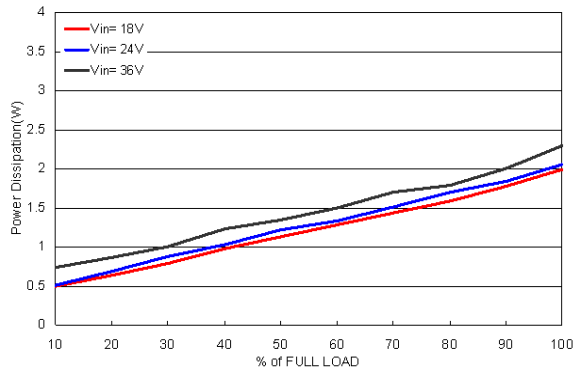
All test conditions are at 25 ºC. PXB15-24D05

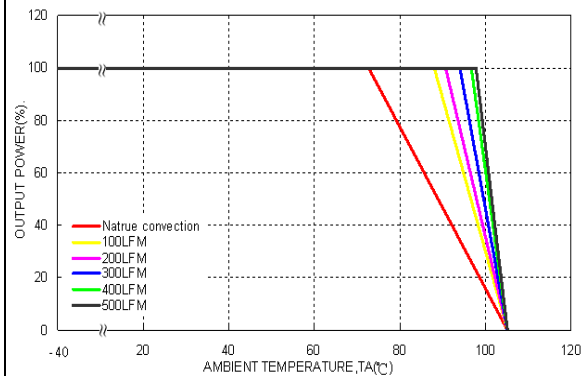**Conduction Emission of EN55022 Class A**

Vin = Vin(nom) **; Full Load**

Using ON/OFF Voltage Start-Up and Vo Rise Characteristic

Vin = Vin(nom) **; Full Load**

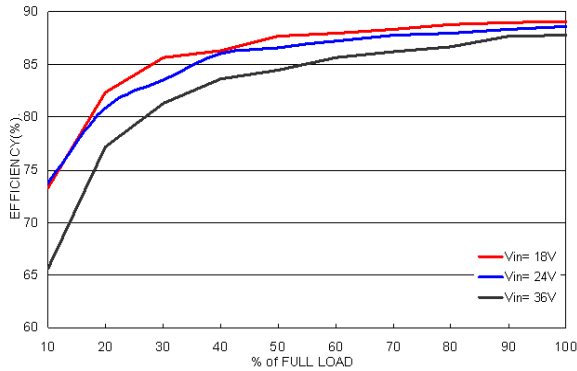**Conduction Emission of EN55022 Class B**

Vin = Vin(nom) **; Full Load**

Power Dissipation versus Output Current
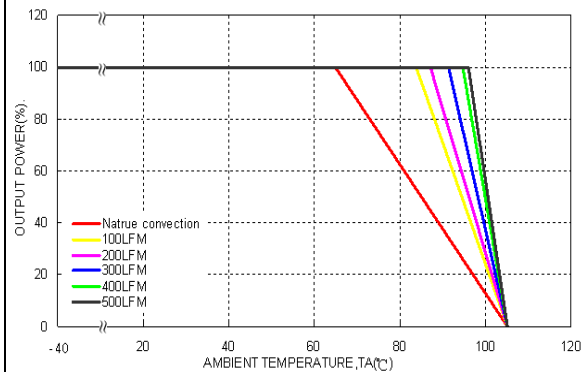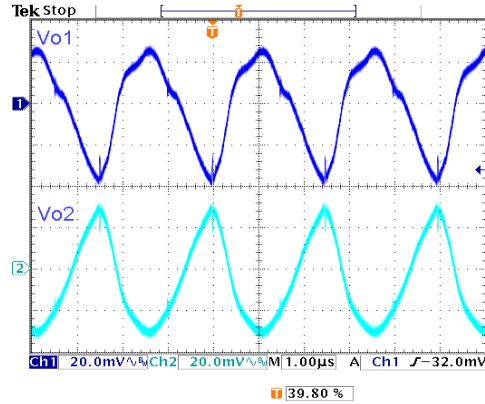

Derating Output Current Versus Ambient Temperature with Heat-Sink

and Airflow, Vin = Vin(nom)
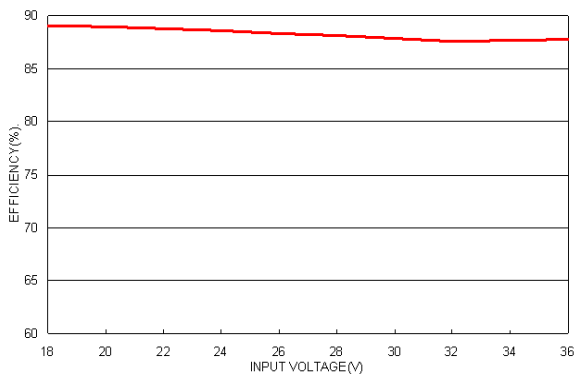
Characteristic Curves (Continued)

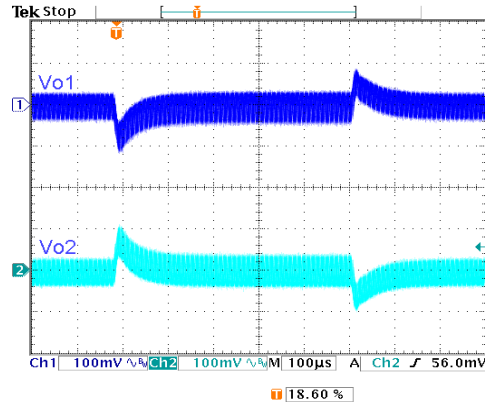All test conditions are at 25 ºC. PXB15-24D12

Efficiency versus Output Current

Typical Output Ripple and Noise.

Vin = Vin(nom) **; Full Load**

Efficiency versus Input Voltage. Full Load

Transient Response to Dynamic Load Change from

100% to 75% to 100% of Full Load ; Vin = Vin(nom)

Derating Output Current versus Ambient Temperature and Airflow
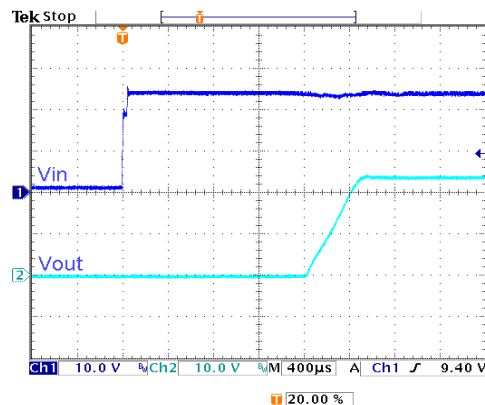
Vin = Vin(nom)

Typical Input Start-Up and Output Rise Characteristic

Vin = Vin(nom) **; Full Load**

Characteristic Curves (Continued)

All test conditions are at 25 ºC. PXB15-24D12

Conduction Emission of EN55022 Class A

Vin = Vin(nom) **; Full Load**

Using ON/OFF Voltage Start-Up and Vo Rise Characteristic

Vin = Vin(nom)**; Full Load**

Conduction Emission of EN55022 Class B

Vin = Vin(nom) **; Full Load**

Power Dissipation versus Output Current

Derating Output Current Versus Ambient Temperature with Heat-Sink and Airflow, Vin = Vin(nom)

Characteristic Curves (Continued)

All test conditions are at 25 ºC. PXB15-24D15
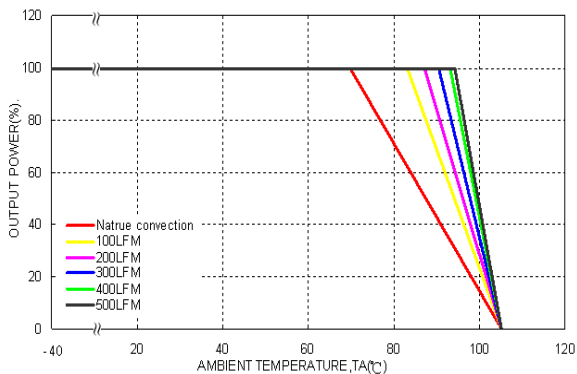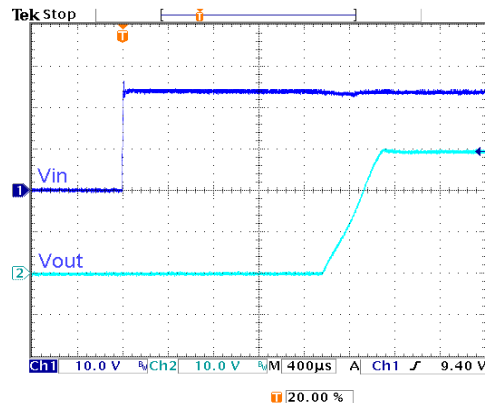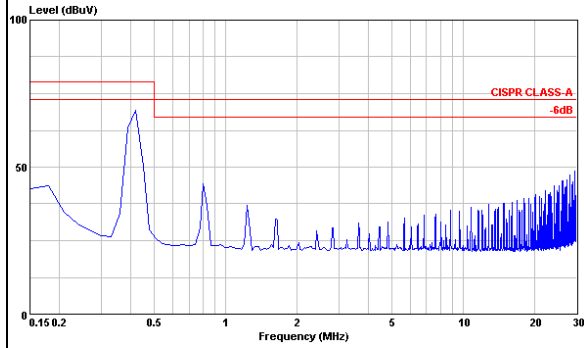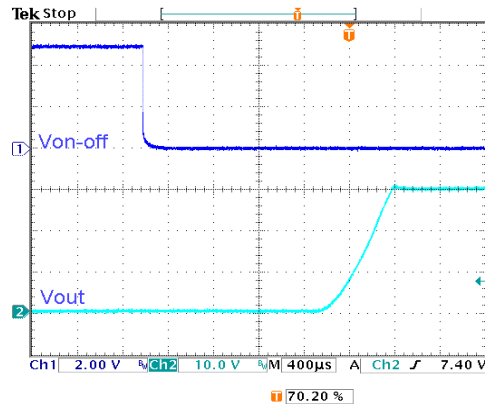

Efficiency versus Output Current

Typical Output Ripple and Noise.

Vin = Vin(nom) **; Full Load**

Efficiency versus Input Voltage. Full Load

Transient Response to Dynamic Load Change from

100% to 75% to 100% of Full Load ; Vin = Vin(nom)

Derating Output Current versus Ambient Temperature and Airflow

Vin = Vin(nom)

Typical Input Start-Up and Output Rise Characteristic

Vin = Vin(nom) **; Full Load**
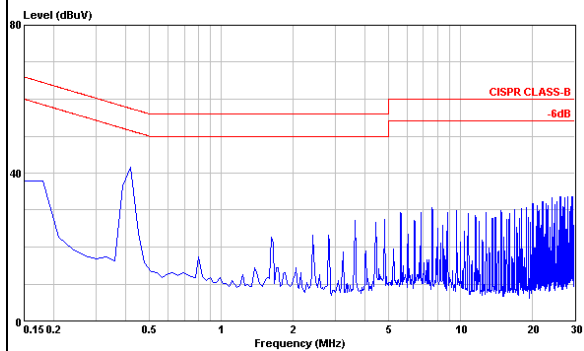
Characteristic Curves (Continued)
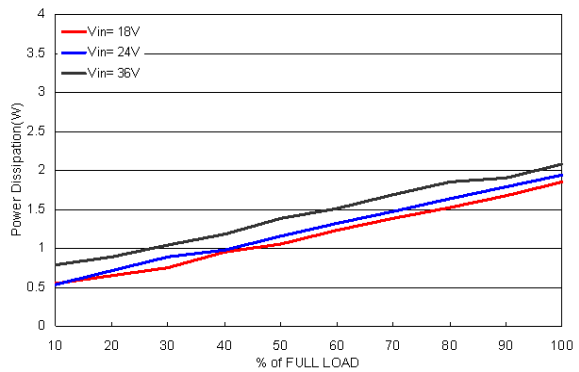
All test conditions are at 25 ºC. PXB15-24D15

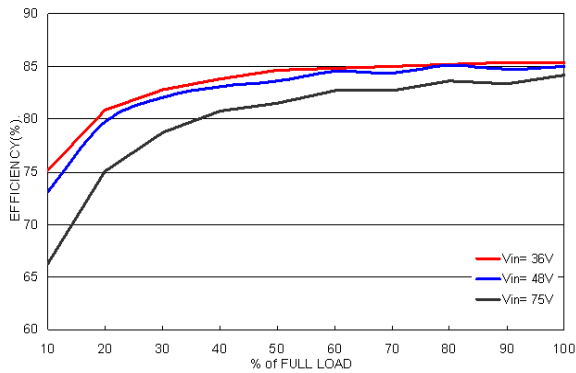**Conduction Emission of EN55022 Class A**

Vin = Vin(nom) **; Full Load**

Using ON/OFF Voltage Start-Up and Vo Rise Characteristic

Vin = Vin(nom) **; Full Load**

Conduction Emission of EN55022 Class B

Vin = Vin(nom) **; Full Load**

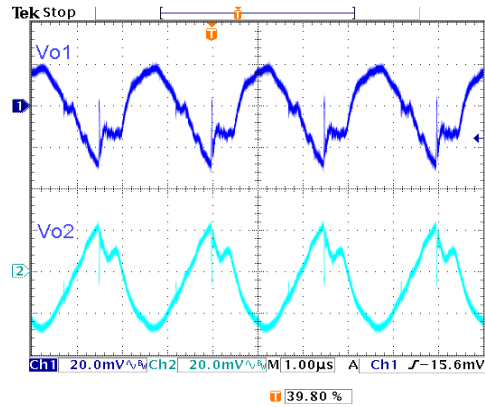**Power Dissipation versus Output Current**

Derating Output Current Versus Ambient Temperature with Heat-Sink

and Airflow, Vin = Vin(nom)
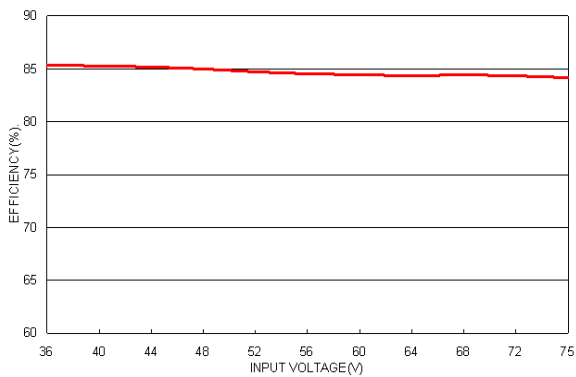
Characteristic Curves (Continued)

All test conditions are at 25 ºC. PXB15-48D05
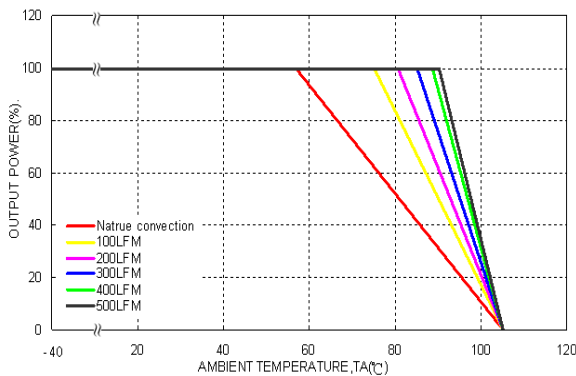

Efficiency versus Output Current

Typical Output Ripple and Noise.
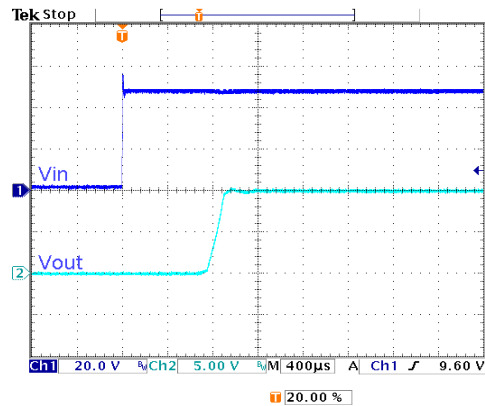Vin = Vin(nom) **; Full Load**

Efficiency versus Input Voltage. Full Load

Transient Response to Dynamic Load Change from
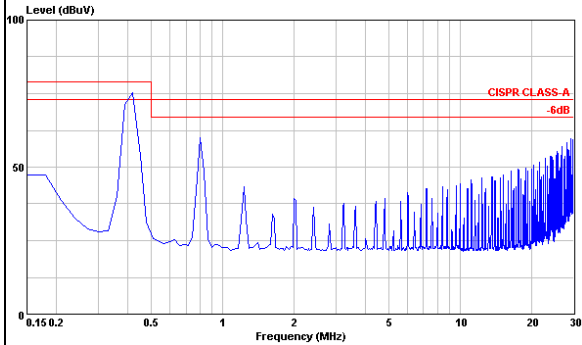**100% to 75% to 100% of Full Load ;** Vin = Vin(nom)

Derating Output Current versus Ambient Temperature and Airflow
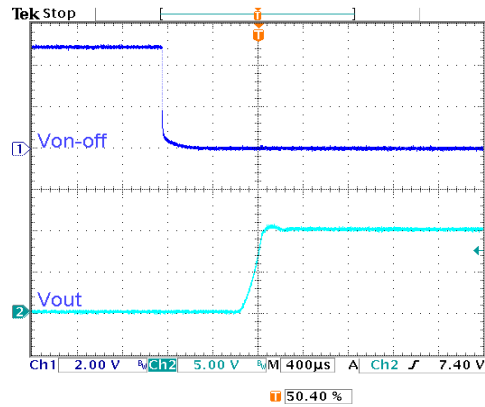Vin = Vin(nom)

Typical Input Start-Up and Output Rise Characteristic
Vin = Vin(nom) **; Full Load**
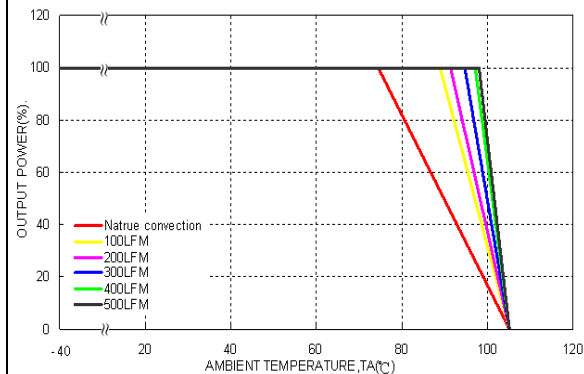
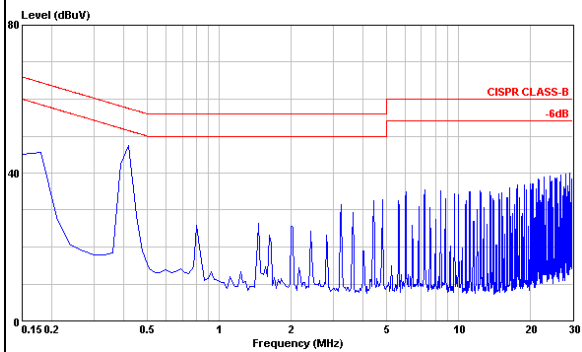## Characteristic Curves (Continued)
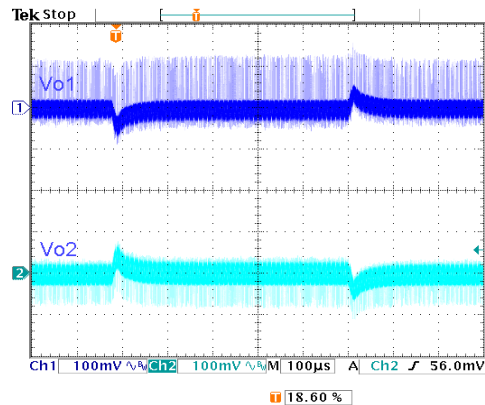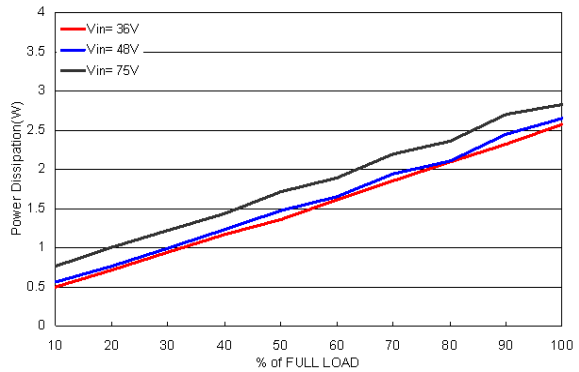
All test conditions are at 25 °C. PXB15-48D05

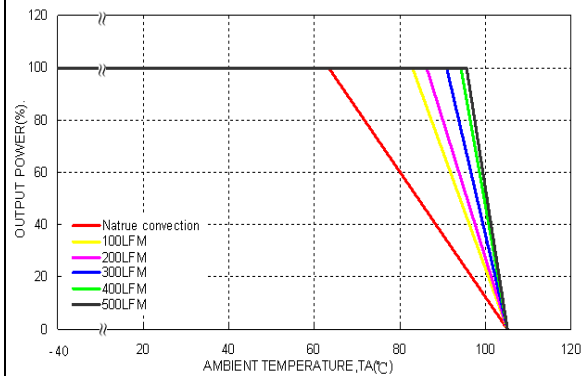**Conduction Emission of EN55022 Class A**

Vin = Vin(nom) ; **Full Load**

Using ON/OFF Voltage Start-Up and Vo Rise Characteristic

Vin = Vin(nom); **Full Load**

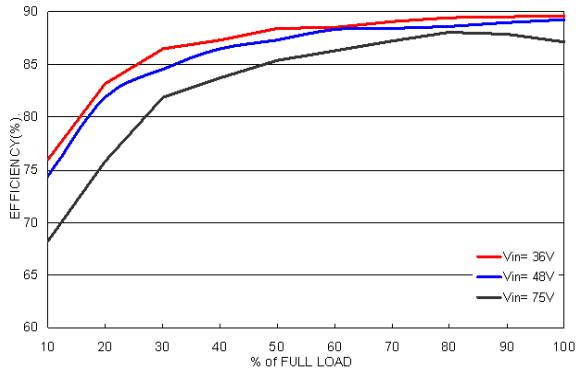**Conduction Emission of EN55022 Class B**

Vin = Vin(nom) ; **Full Load**

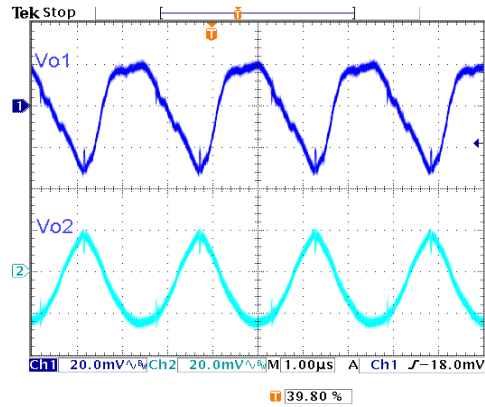**Power Dissipation versus Output Current**

Derating Output Current Versus Ambient Temperature with Heat-Sink

and Airflow, Vin = Vin(nom)
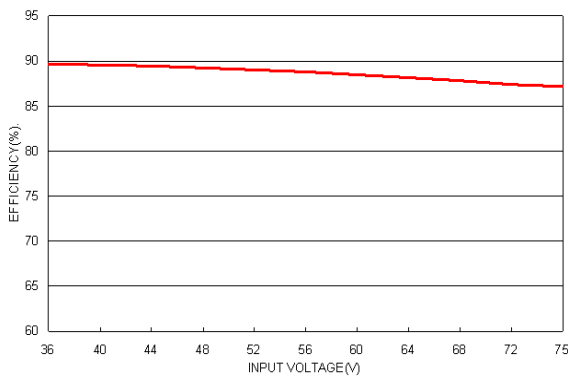
Characteristic Curves (Continued)

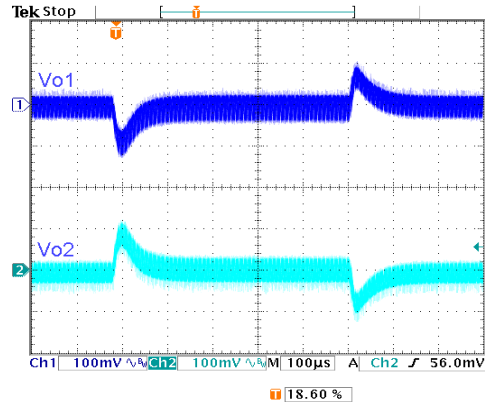All test conditions are at 25 ºC. PXB15-48D12
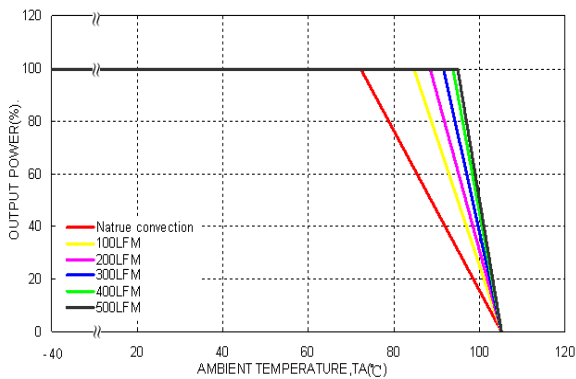

Efficiency versus Output Current

Typical Output Ripple and Noise.

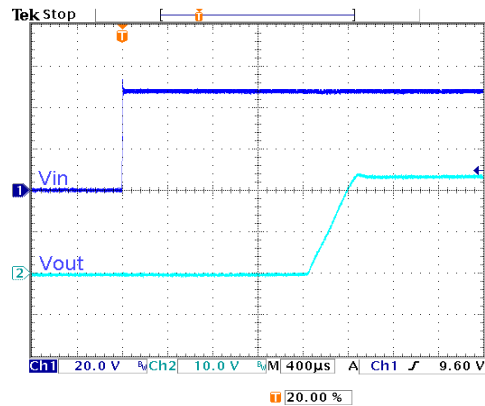Vin = Vin(nom) **; Full Load**

Efficiency versus Input Voltage. Full Load

Transient Response to Dynamic Load Change from

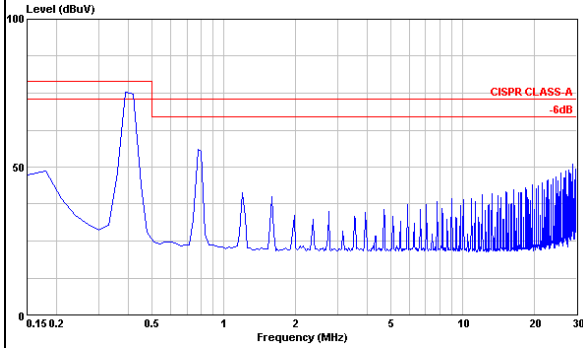**100% to 75% to 100% of Full Load ;** Vin = Vin(nom)

Derating Output Current versus Ambient Temperature and Airflow
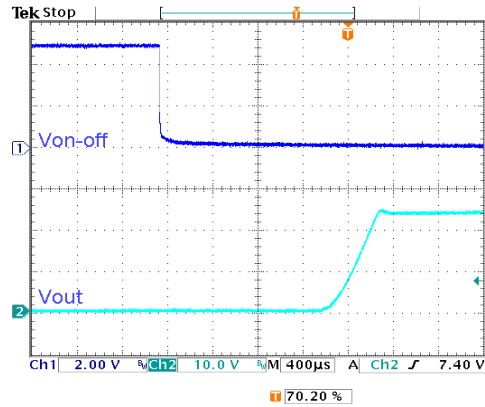
Vin = Vin(nom)

Typical Input Start-Up and Output Rise Characteristic

Vin = Vin(nom) **; Full Load**
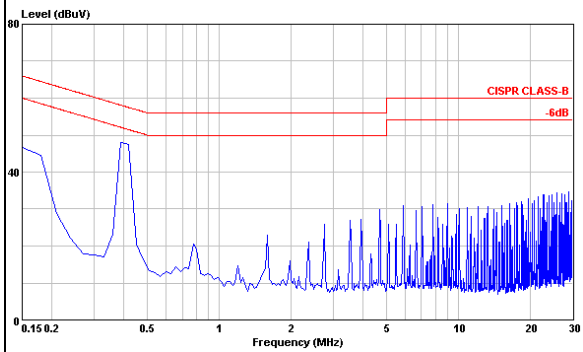
Characteristic Curves (Continued)

All test conditions are at 25 ºC. PXB15-48D12

Conduction Emission of EN55022 Class A

Vin = Vin(nom) **; Full Load**

Using ON/OFF Voltage Start-Up and Vo Rise Characteristic

Vin = Vin(nom) **; Full Load**

Conduction Emission of EN55022 Class B

Vin = Vin(nom) **; Full Load**

Power Dissipation versus Output Current

Derating Output Current Versus Ambient Temperature with Heat-Sink

and Airflow, Vin = Vin(nom)

Characteristic Curves (Continued)

All test conditions are at 25 ºC. PXB15-48D15

Efficiency versus Output Current

Typical Output Ripple and Noise.

Vin = Vin(nom) **; Full Load**

Efficiency versus Input Voltage. Full Load

Transient Response to Dynamic Load Change from

100% to 75% to 100% of Full Load ; Vin = Vin(nom)

Derating Output Current versus Ambient Temperature and Airflow

Vin = Vin(nom)

Typical Input Start-Up and Output Rise Characteristic

Vin = Vin(nom)**; Full Load**

Characteristic Curves (Continued)
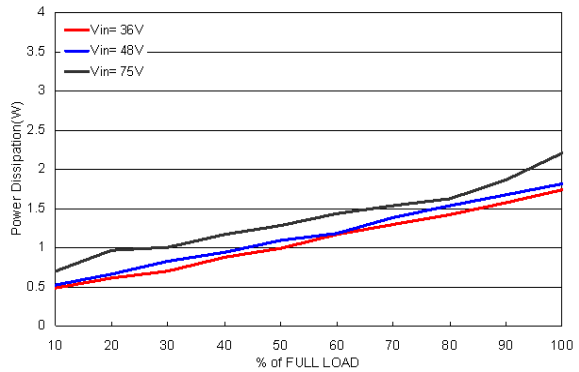
All test conditions are at 25 ºC. PXB15-48D15

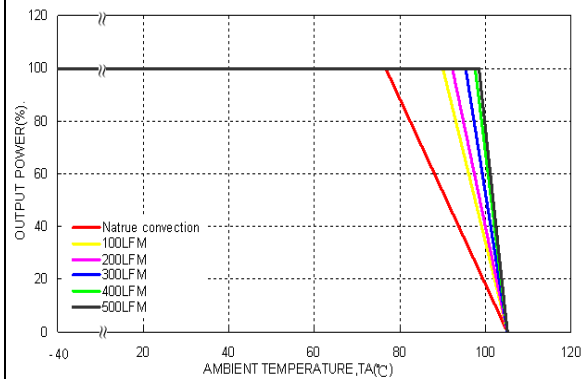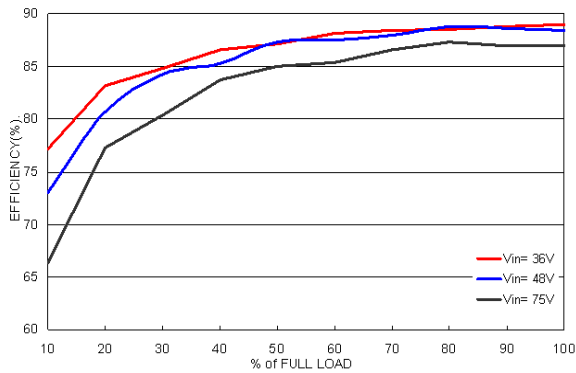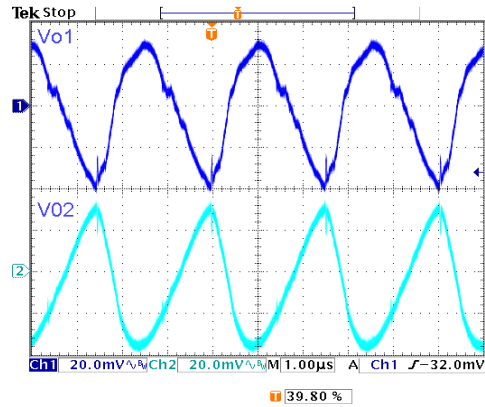**Conduction Emission of EN55022 Class A**
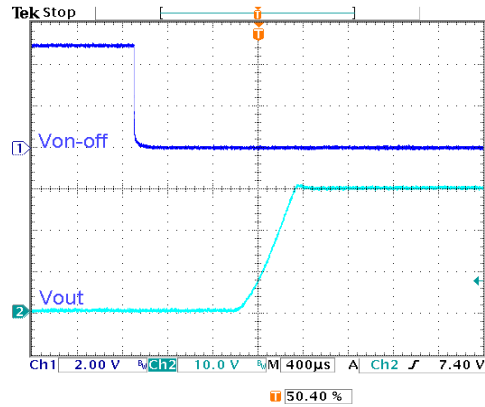
Vin = Vin(nom) **; Full Load**

Using ON/OFF Voltage Start-Up and Vo Rise Characteristic

Vin = Vin(nom) **; Full Load**
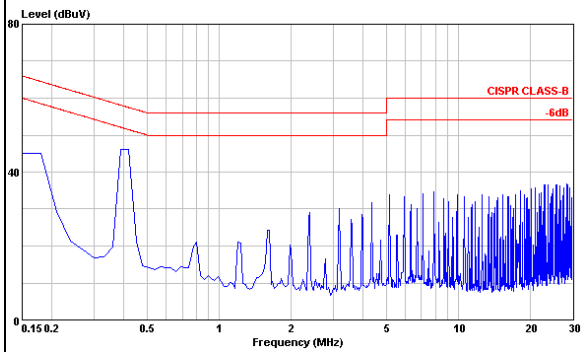
Conduction Emission of EN55022 Class B

Vin = Vin(nom) **; Full Load**

Power Dissipation versus Output Current

**Derating Output Current Versus Ambient Temperature with Heat-Sink
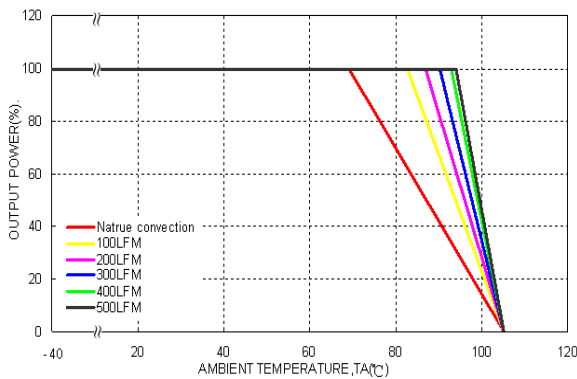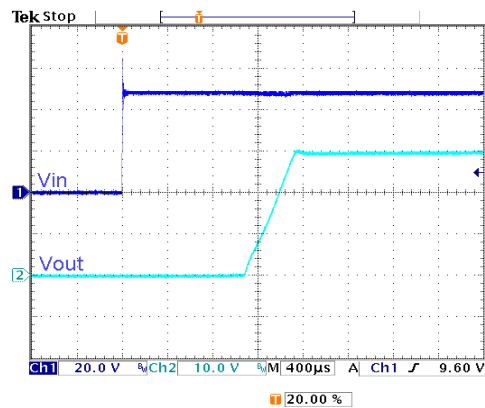and Airflow, Vin = Vin(nom)**

Testing Configurations

Input reflected-ripple current measurement

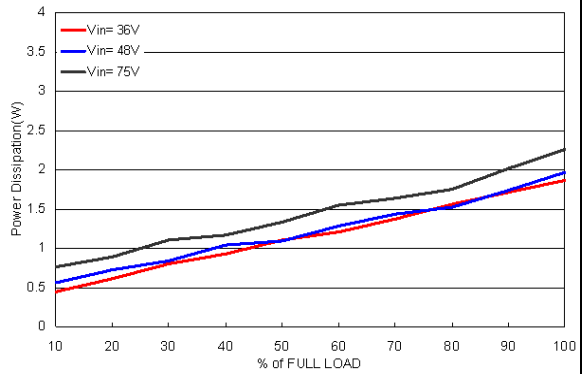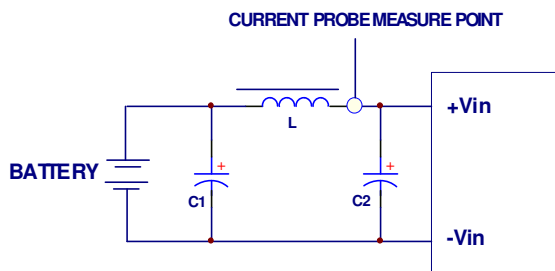| Component	Value	Voltage	Reference
L	12µH	----	----
C1	10µF	100V	Aluminum Electrolytic Capacitor
C2	10µF	100V	Aluminum Electrolytic Capacitor

Peak-to-peak output ripple & noise measurement
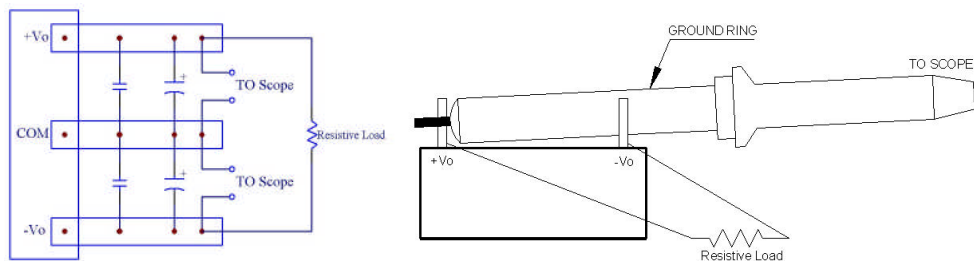
Output voltage and efficiency measurement
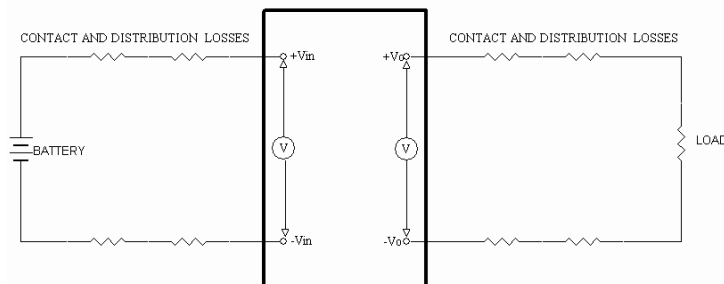
Note: All measurements are taken at the module terminals.

$$Efficiency = \left(\frac{V_o \times I_o}{V_{in} \times I_{in}} \right) \times 100\%$$

EMC considerations

Suggested schematic for EN55022 conducted emission Class A limits

Recommended layout with input filter

To meet conducted emissions EN55022 CLASS A , the following components are needed:

PXB15-12DXX

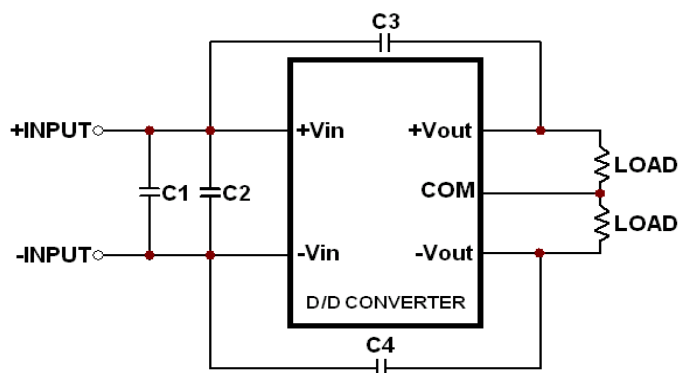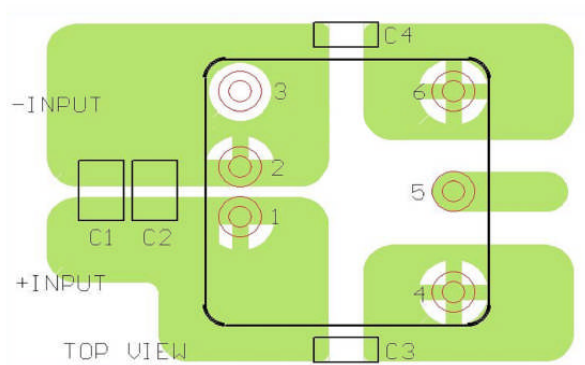| Component	Value	Voltage	Reference
C1	10uF	25V	1812 MLCC
C2	----	----	----
C3,C4	470pF	2KV	1808 MLCC

PXB15-24DXX

Component	Value	Voltage	Reference
C1	6.8uF	50V	1812 MLCC
C2	6.8uF	50V	1812 MLCC
C3,C4	470pF	2KV	1808 MLCC

PXB15-48DXX

Component	Value	Voltage	Reference
C1	2.2uF	100V	1812 MLCC
C2	2.2uF	100V	1812 MLCC
C3,C4	470pF	2KV	1808 MLCC

EMC considerations (Continued)
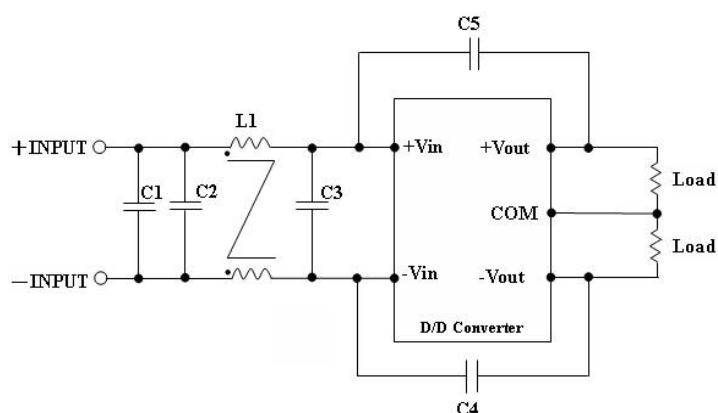
Suggested schematic for EN55022 conducted emission Class B limits
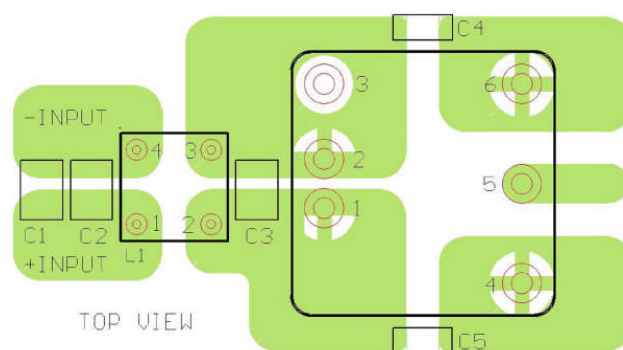
Recommended layout with input filter

To meet conducted emissions EN55022 CLASS B, the following components are needed:

PXB15-12DXX

Component	Value	Voltage	Reference
C1,C3	10µF	25V	1812 MLCC
C2	----	----	----
C4,C5	470pF	2KV	1808 MLCC
L1	145µH	----	Common Choke

PXB15-24DXX

Component	Value	Voltage	Reference
C1,C3	6.8µF	50V	1812 MLCC
C2	----	----	----
C4,C5	470pF	2KV	1808 MLCC
L1	325µH	----	Common Choke

PXB15-48DXX

Component	Value	Voltage	Reference
C1,C3	2.2µF	100V	1812 MLCC
C2	2.2µF	100V	1812 MLCC
C4,C5	1000pF	2KV	1808 MLCC
L1	325µH	----	Common Choke