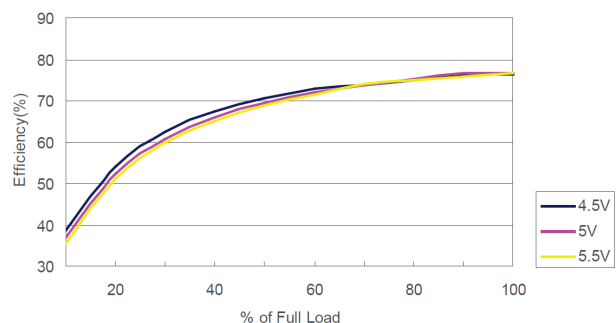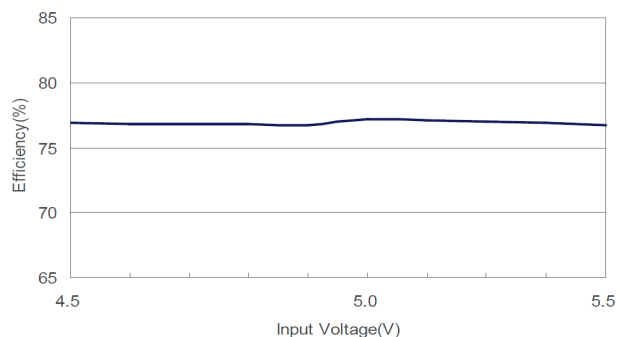# TRACO POWER

Characteristic Curves

TES 2-0511M
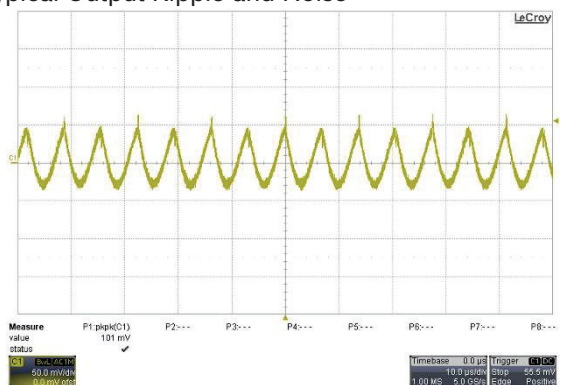
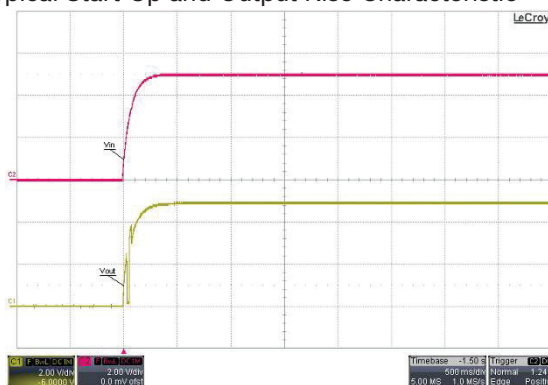**Efficiency versus Output Load**

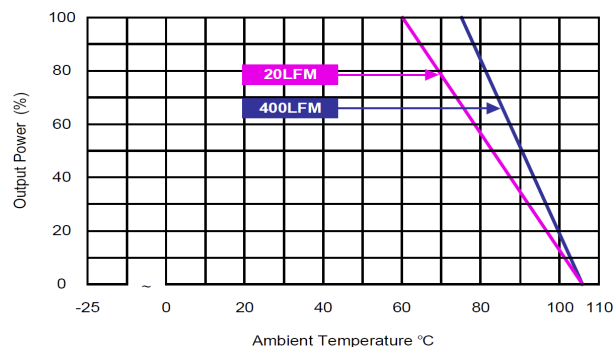**Efficiency versus Input Voltage**

Typical Output Ripple and Noise

Typical Start-Up and Output Rise Characteristic

Derating Output Load versus Ambient Temperature

Load Variation versus Output Voltage

Input Variation versus Output Voltage

TRACO POWER

TES 2-0512M

Efficiency versus Output Load

Efficiency versus Input Voltage

Typical Output Ripple and Noise

Typical Start-Up and Output Rise Characteristic

Derating Output Load versus Ambient Temperature

Load Variation versus Output Voltage

Input Variation versus Output Voltage

TES 2-0513M

Efficiency versus Output Load

Efficiency versus Input Voltage

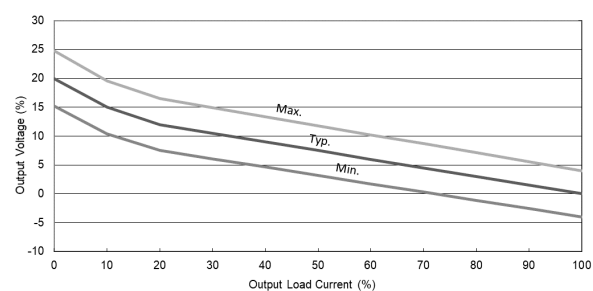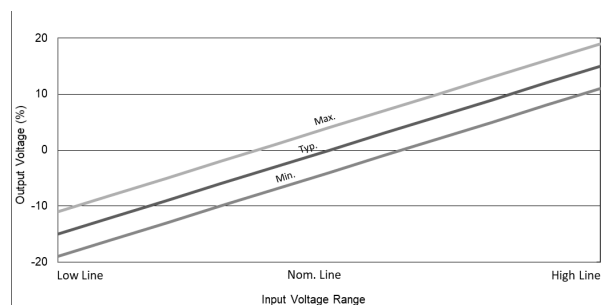Typical Output Ripple and Noise

Typical Start-Up and Output Rise Characteristic

Derating Output Load versus Ambient Temperature
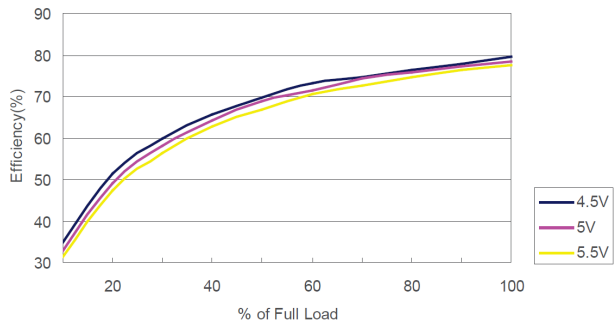

Load Variation versus Output Voltage
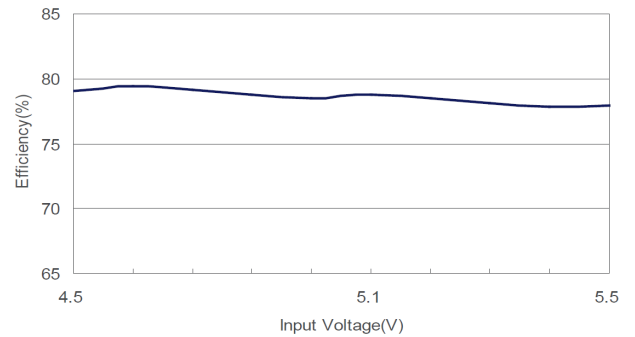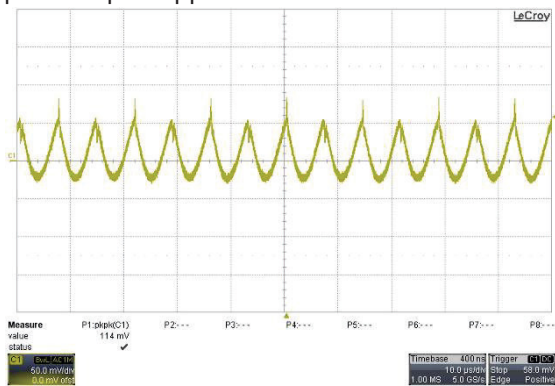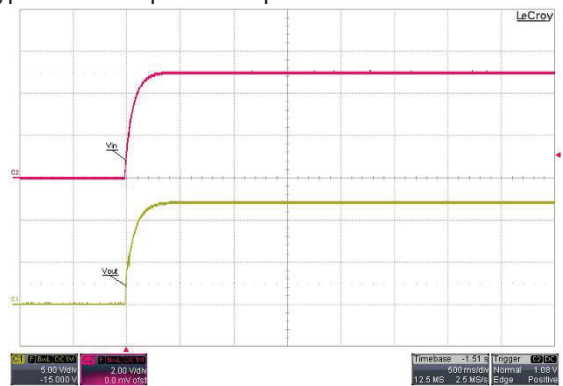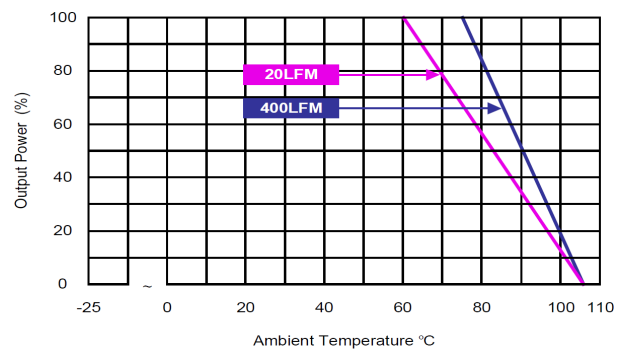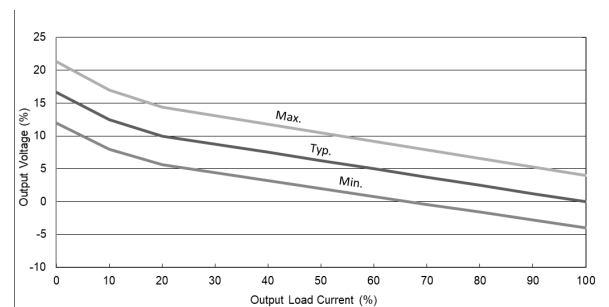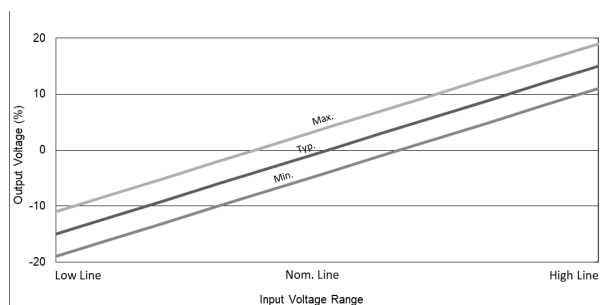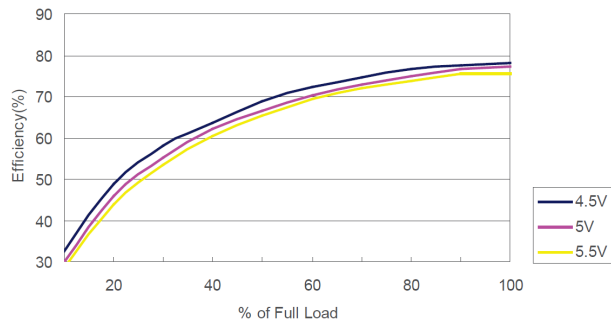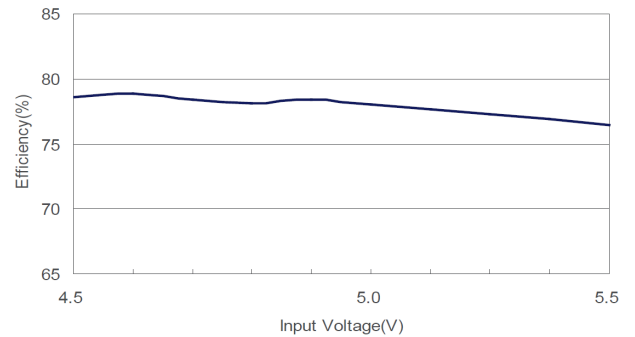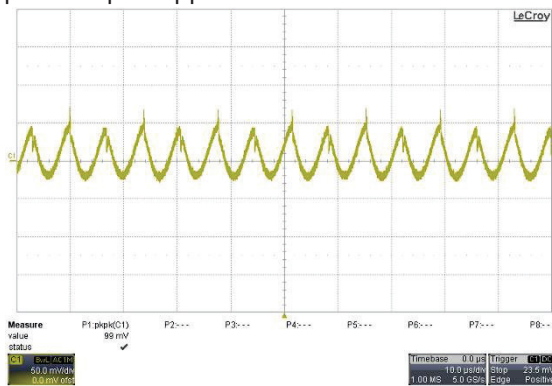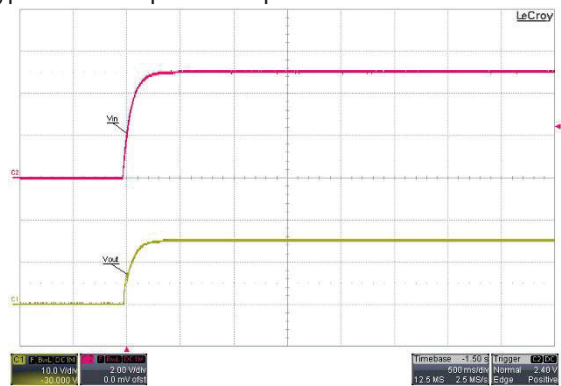

Input Variation versus Output Voltage

II TRACO POWER

TES 2-0522M

Efficiency versus Output Load
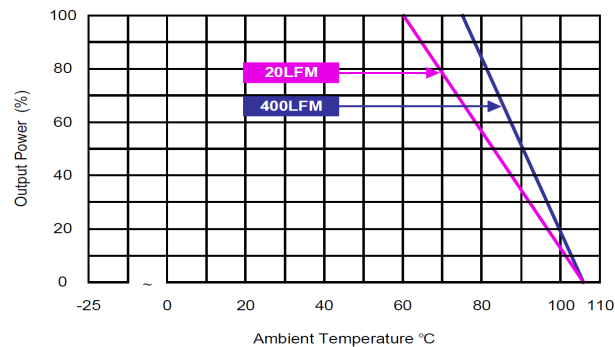

Efficiency versus Input Voltage

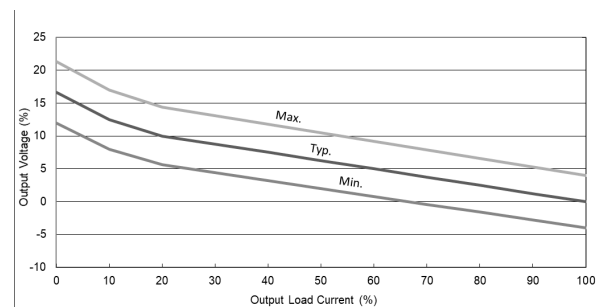### Typical Output Ripple and Noise

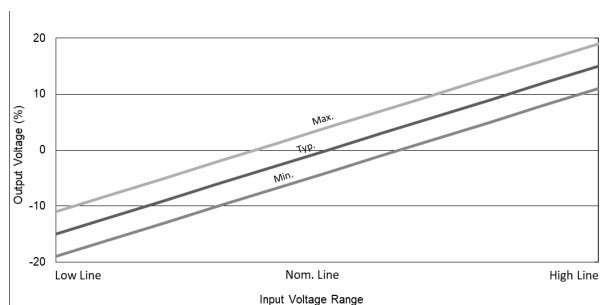### Typical Start-Up and Output Rise Characteristic

Derating Output Load versus Ambient Temperature
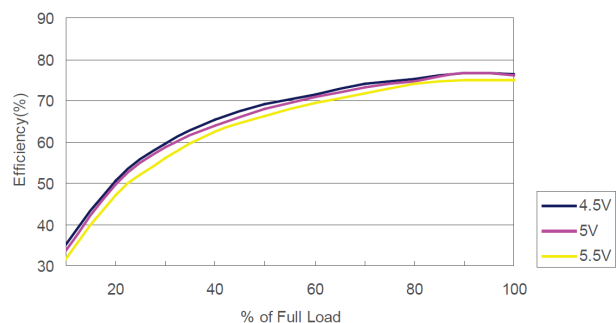

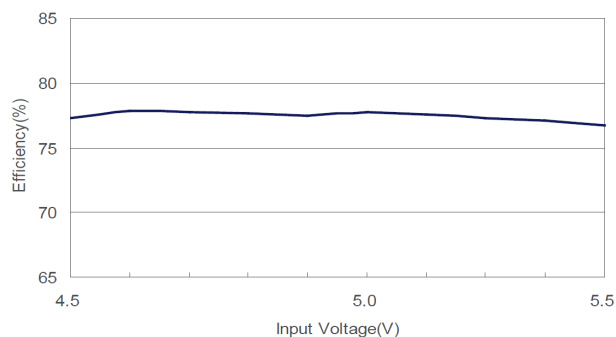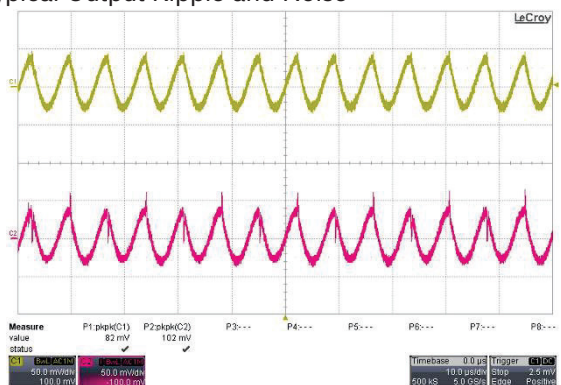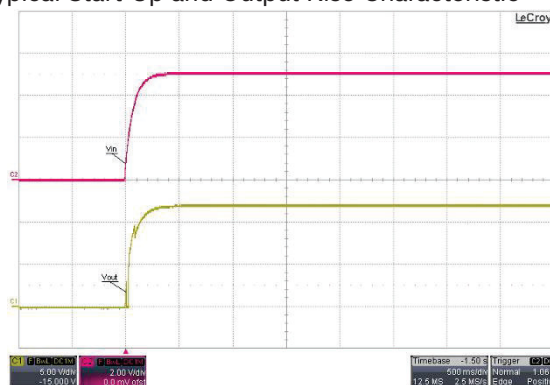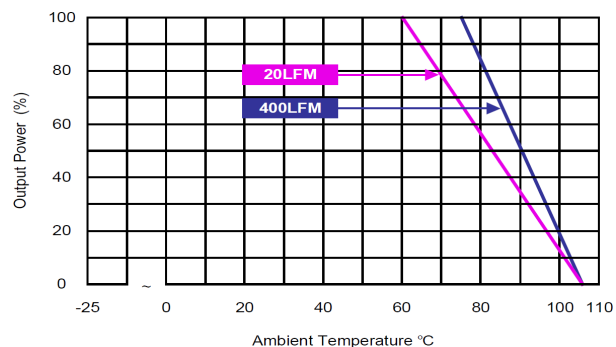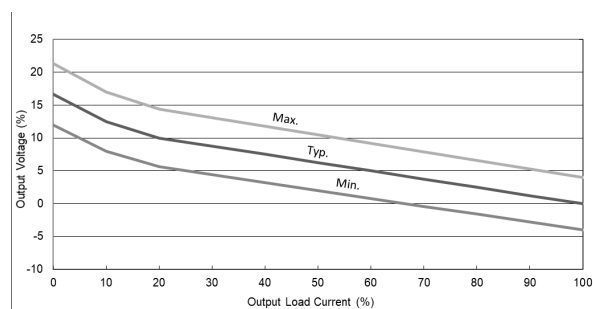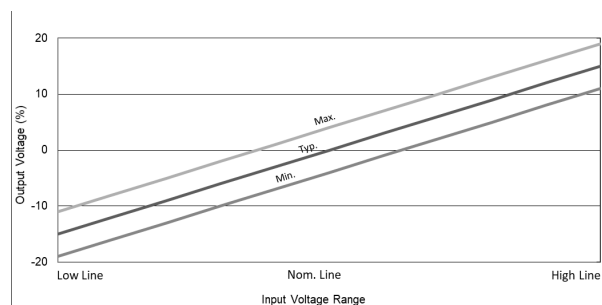### Load Variation versus Output Voltage

Input Variation versus Output Voltage

TRACO POWER

TES 2-0523M

Efficiency versus Output Load

Efficiency(%)
90
80
70
60
50
40
30

20   40   60   80   100
% of Full Load

— 4.5V
— 5V
— 5.5V

Efficiency versus Input Voltage

Efficiency(%)
85
80
75
70
65

4.5   5.0   5.5
Input Voltage(V)

Typical Output Ripple and Noise

LeCroy

Measure   P1:pkpk(C1)   P2:pkpk(C2)   P3:--   P4:--   P5:--   P6:--   P7:--   P8:--
value   91 mV   117 mV
status

C1 BwL AC1M   Bwl DC1M   Timebase 100 ns Trigger C1 DC
    50.0 mV/div   50.0 mV/div   5.00 µs/div Stop   39.5 mV
    -100.0 mV   -100.0 mV   250 kS 5.0 GS/s Edge Positive

Typical Start-Up and Output Rise Characteristic

LeCroy

Vin

Vout

C1 F BwL DC1M   F BwL DC1M   Timebase -1.50 s Trigger C2 DC
    10.0 V/div   2.00 V/div   500 ms/div Normal 1.06 V
    -30.000 V   0.0 mV ofst   12.5 MS 2.5 MS/s Edge Positive

Derating Output Load versus Ambient Temperature

Output Power (%)
100
80
60
40
20
0

-25   0   20   40   60   80   100 110
Ambient Temperature °C

20LFM
400LFM

Load Variation versus Output Voltage

Output Voltage (%)
25
20
15
10
5
0
-5
-10

0   10   20   30   40   50   60   70   80   90 100
Output Load Current (%)

Max.
Typ.
Min.

Input Variation versus Output Voltage

Output Voltage (%)
20
10
0
-10
-20

Low Line   Nom. Line   High Line
Input Voltage Range

Max.
Typ.
Min.

TRACO POWER

TES 2-1211M

Efficiency versus Output Load

Efficiency versus Input Voltage

Typical Output Ripple and Noise

Typical Start-Up and Output Rise Characteristic

Derating Output Load versus Ambient Temperature
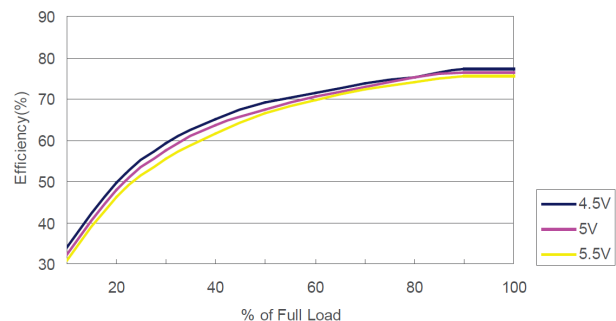

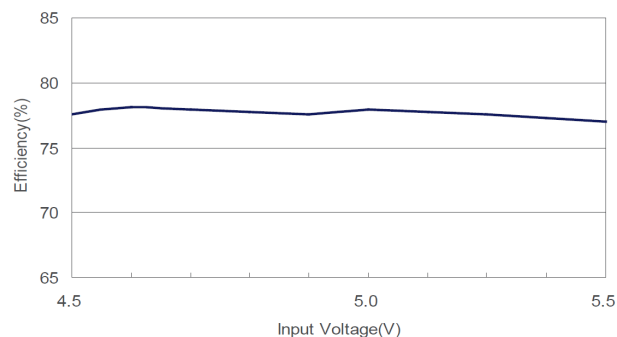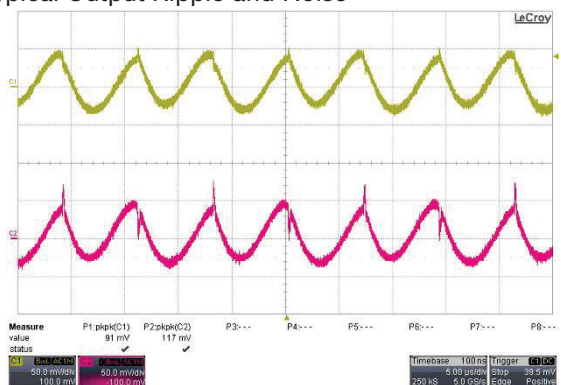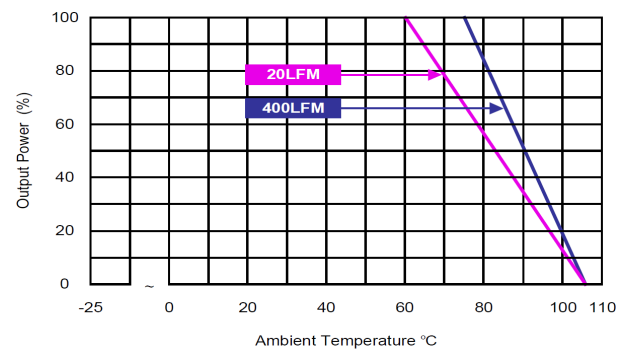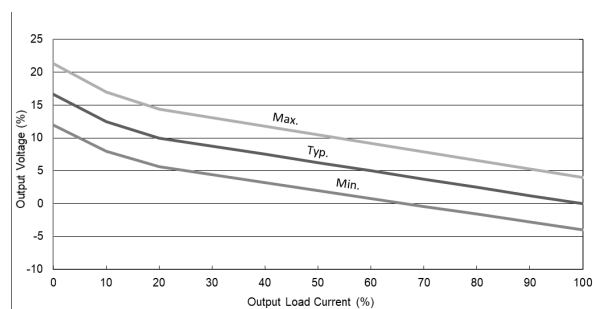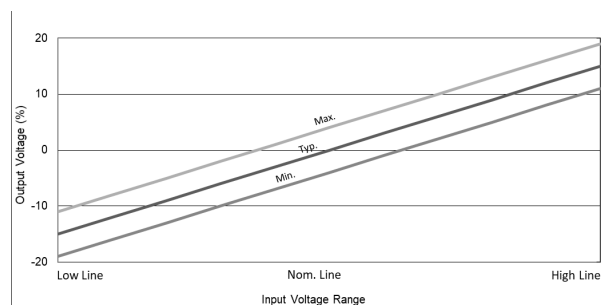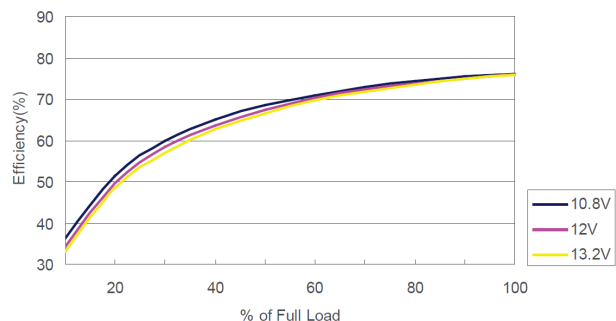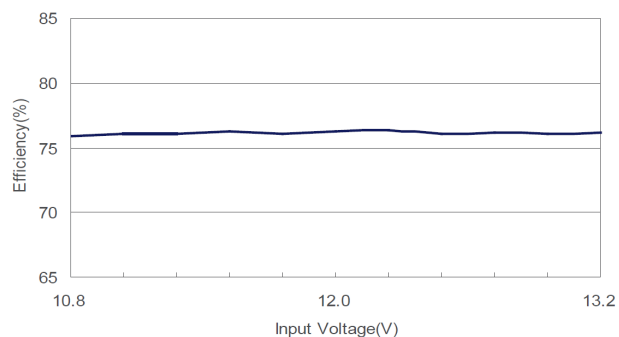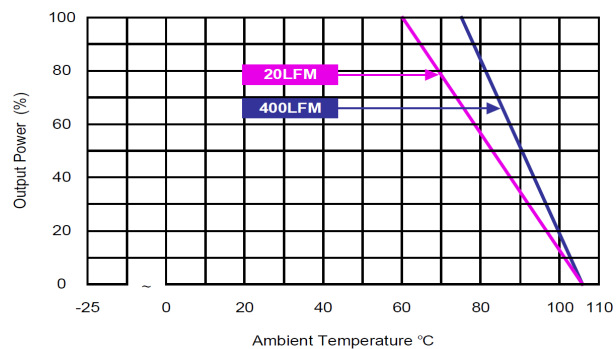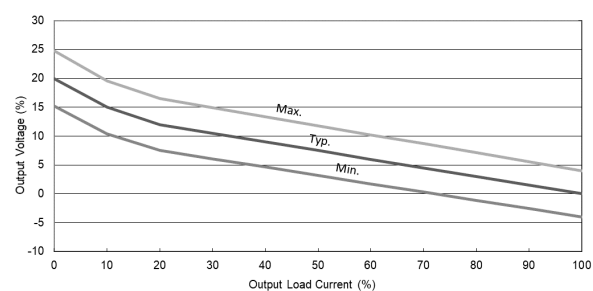### Load Variation versus Output Voltage

Input Variation versus Output Voltage

TRACO POWER

TES 2-1212M

Efficiency versus Output Load

Efficiency versus Input Voltage

Typical Output Ripple and Noise

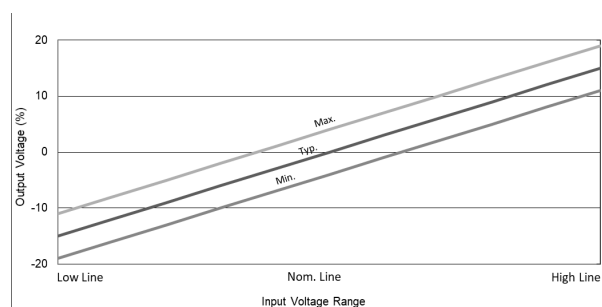### Typical Start-Up and Output Rise Characteristic

Derating Output Load versus Ambient Temperature

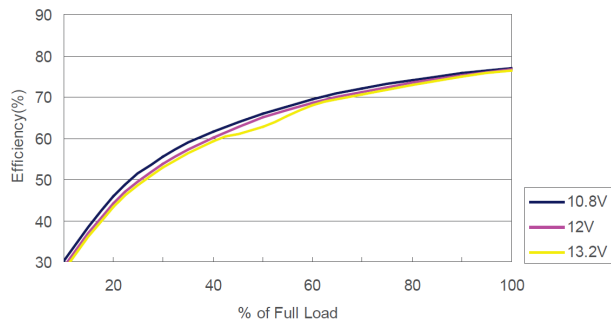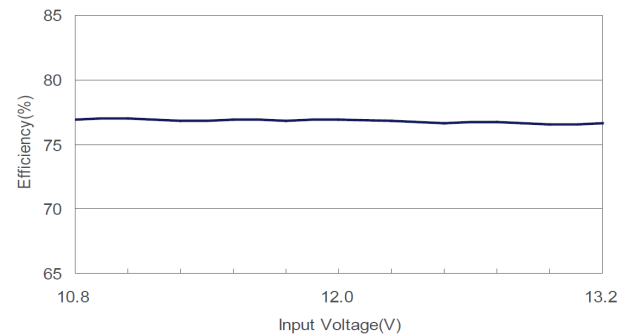### Load Variation versus Output Voltage

Input Variation versus Output Voltage

TES 2-1213M
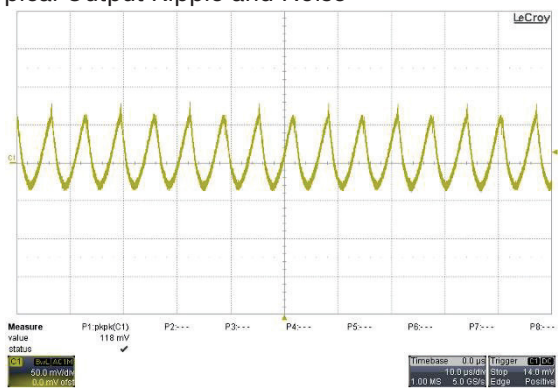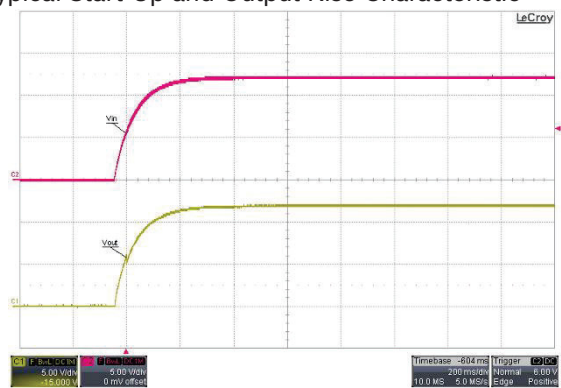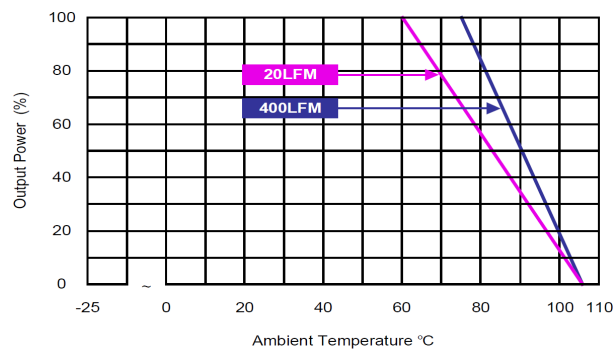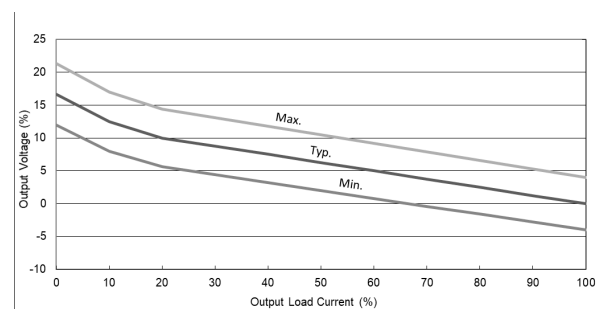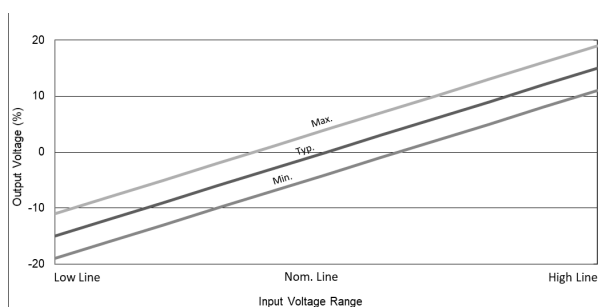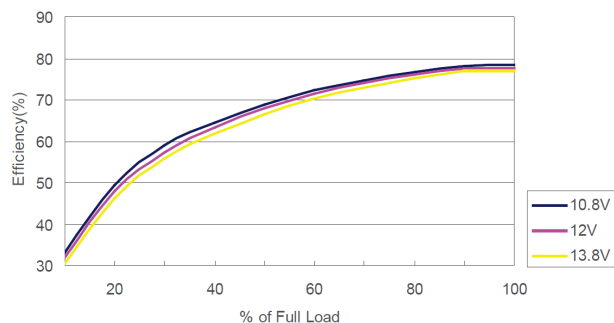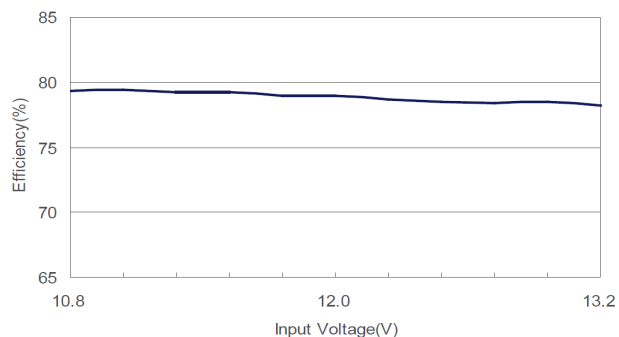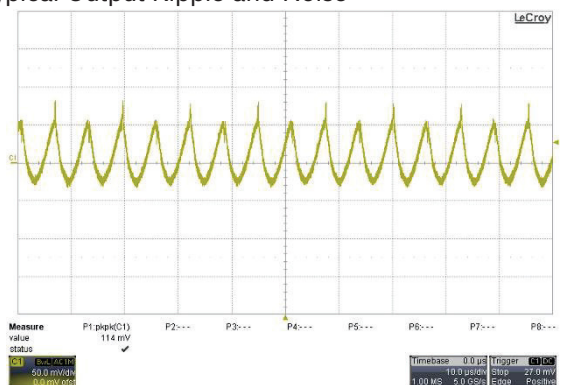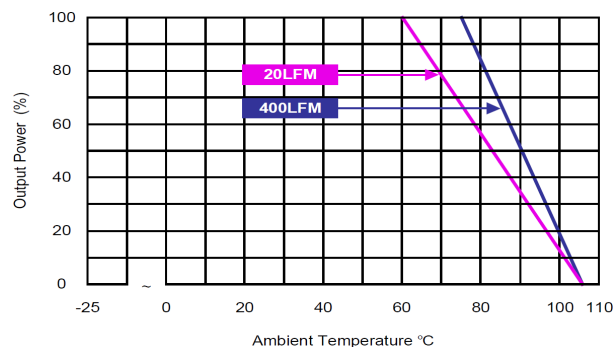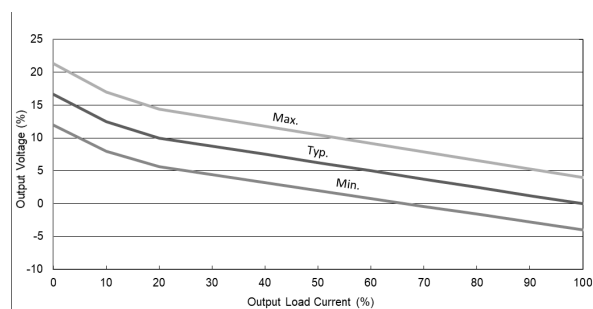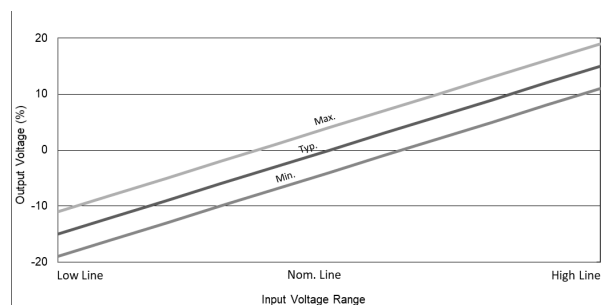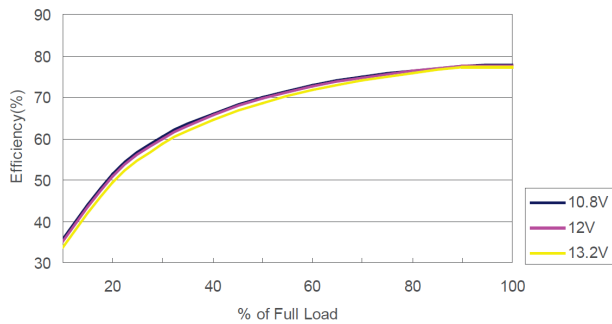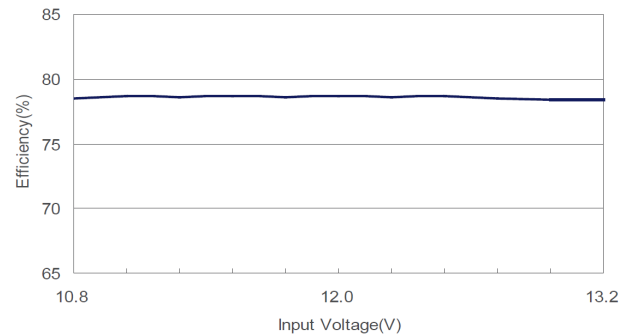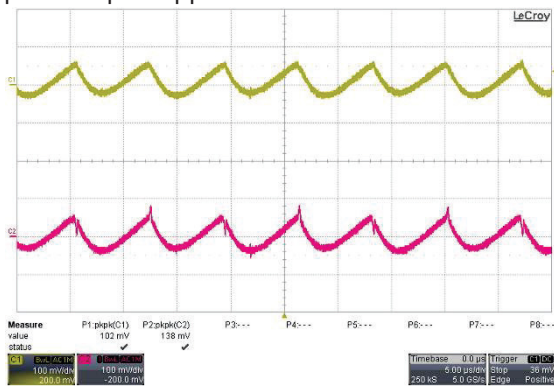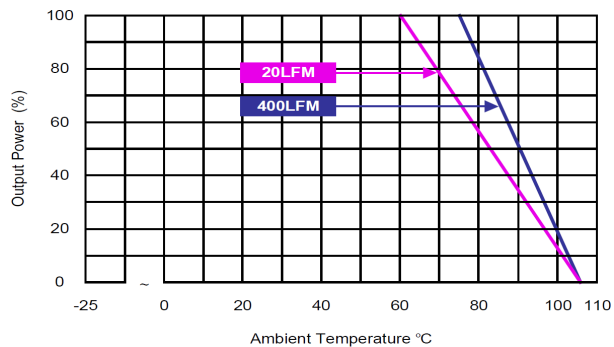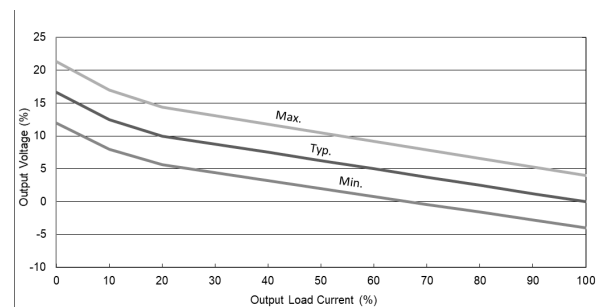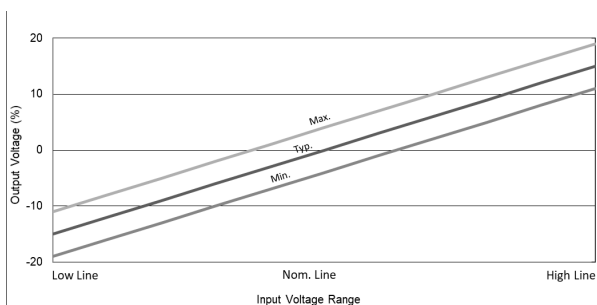
Efficiency versus Output Load

Efficiency(%)

% of Full Load

10.8V
12V
13.8V

Efficiency versus Input Voltage

Efficiency(%)

Input Voltage(V)

Typical Output Ripple and Noise

LeCroy

Measure P1:pkpk(C1) P2:-- P3:-- P4:-- P5:-- P6:-- P7:-- P8:--
value 114 mV
status

C1 BwL AC1M
50.0 mV/div
0.0 mV ofst

Timebase 0.0 µs Trigger C1 DC
10.0 µs/div Stop 27.0 mV
1.00 MS 5.0 GS/s Edge Positive

Typical Start-Up and Output Rise Characteristic

LeCroy

Vin

Vout

C1 BwL DC1M BwL DC1M
5.00 V/div 5.00 V/div
-15.000 V 0 mV offset

Timebase -588 ms Trigger C3 DC
200 ms/div Normal 6.00 V
10.0 MS 5.0 MS/s Edge Positive

Derating Output Load versus Ambient Temperature

Output Power (%)

20LFM

400LFM

Ambient Temperature °C

Load Variation versus Output Voltage

Output Voltage (%)

Max.
Typ.
Min.

Output Load Current (%)

Input Variation versus Output Voltage

Output Voltage (%)

Max.
Typ.
Min.

Low Line   Nom. Line   High Line
Input Voltage Range

TES 2-1222M

Efficiency versus Output Load

Efficiency(%)

90
80
70
60
50
40
30

20　40　60　80　100

% of Full Load

— 10.8V
— 12V
— 13.2V

Efficiency versus Input Voltage

Efficiency(%)

85

80

75

70

65

10.8　　12.0　　13.2

Input Voltage(V)

Typical Output Ripple and Noise

LeCroy

Measure　P1:pkpk(C1)　P2:pkpk(C2)　P3:---　P4:---　P5:---　P6:---　P7:---　P8:---
value　102 mV　138 mV
status

C1　BwL AC 1M　C2　BwL AC 1M
100 mV/div　100 mV/div
-200.0 mV　-200.0 mV

Timebase　0.0 µs　Trigger　C1 DC
5.00 µs/div　Stop　36 mV
250 kS　5.0 GS/s　Edge　Positive

Typical Start-Up and Output Rise Characteristic

LeCroy

Vin

Vout

C1　BwL DC 1M　C2　BwL DC 1M
5.00 V/div　5.00 V/div
-15.000 V　0 mV offset

Timebase　-1.50 s　Trigger　C2 DC
500 ms/div　Stop　4.40 V
12.5 MS　2.5 MS/s　Edge　Positive

Derating Output Load versus Ambient Temperature

Output Power (%)

100
80
60
40
20
0

-25　0　20　40　60　80　100　110

Ambient Temperature °C

20LFM
400LFM

Load Variation versus Output Voltage

Output Voltage (%)

25
20
15
10
5
0
-5
-10

0　10　20　30　40　50　60　70　80　90　100

Output Load Current (%)

Max.
Typ.
Min.

Input Variation versus Output Voltage

Output Voltage (%)

20
10
0
-10
-20

Low Line　　Nom. Line　　High Line

Input Voltage Range

Max.
Typ.
Min.

TES 2-1223M

Efficiency versus Output Load

Legend:
- 10.8V
- 12V
- 13.2V

Efficiency versus Input Voltage

Typical Output Ripple and Noise

Typical Start-Up and Output Rise Characteristic

Derating Output Load versus Ambient Temperature
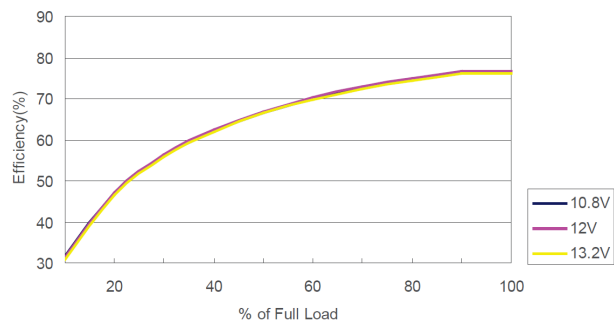

Load Variation versus Output Voltage
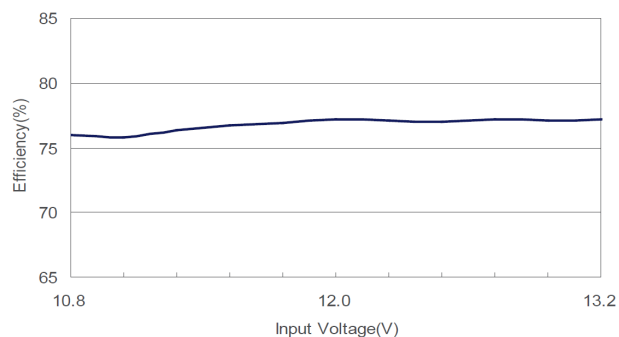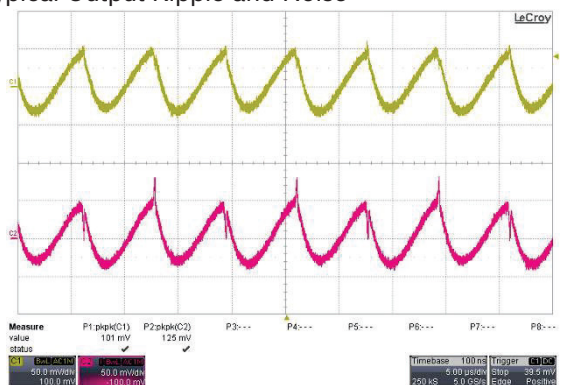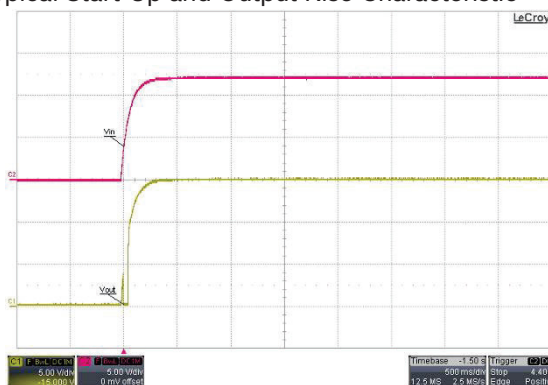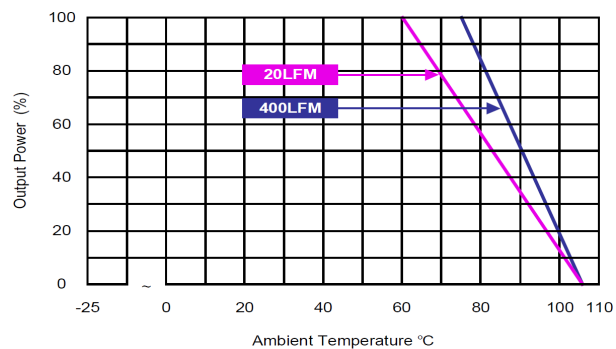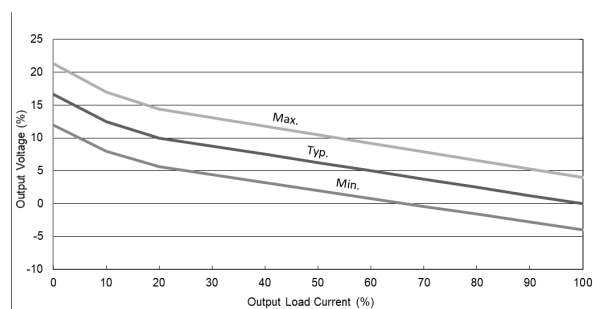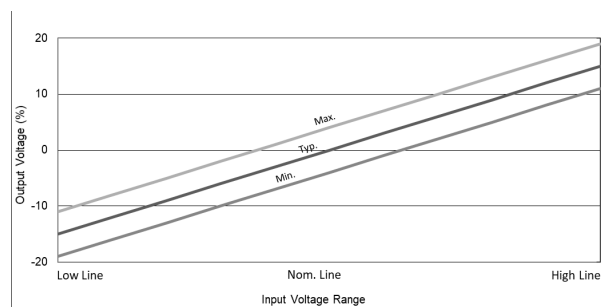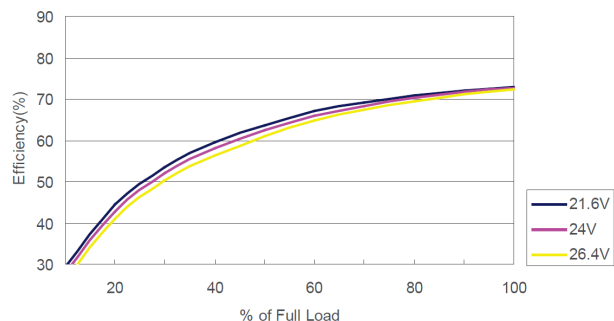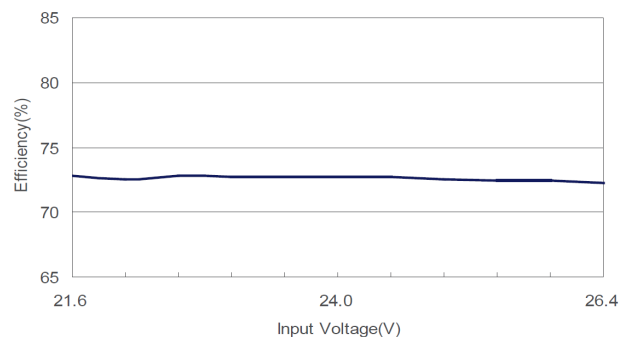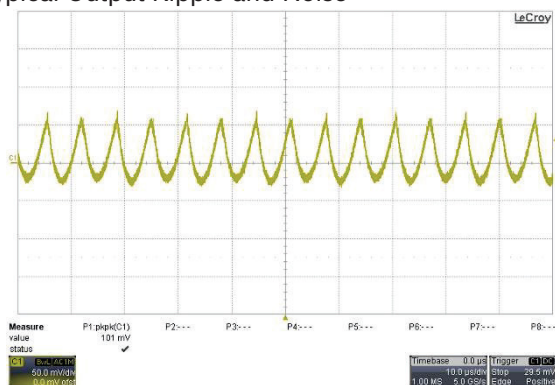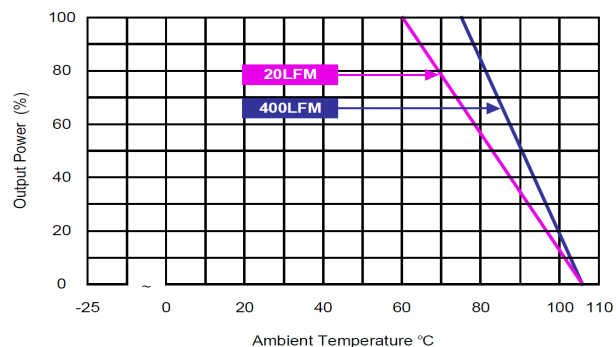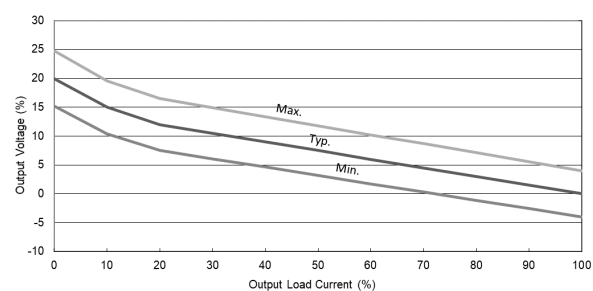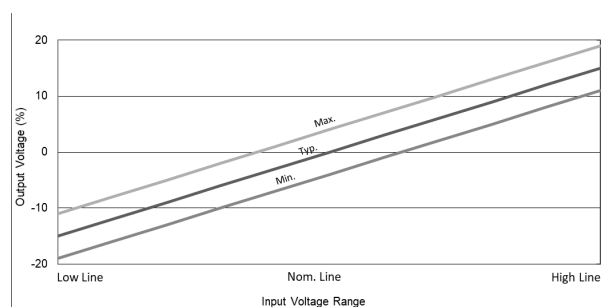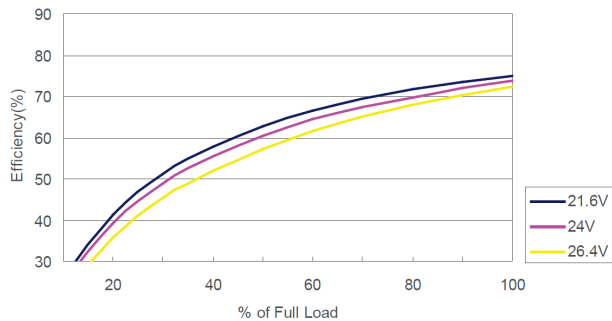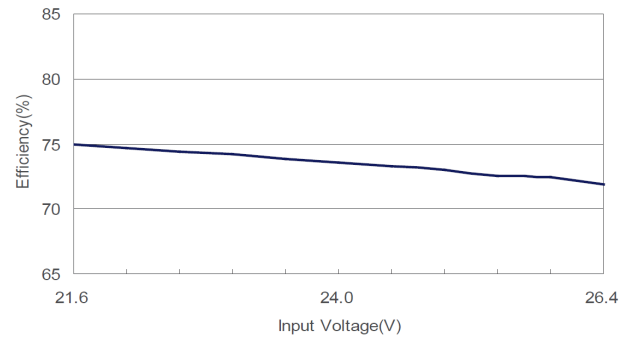

Input Variation versus Output Voltage

TRACO POWER

TES 2-2411M

Efficiency versus Output Load

Efficiency versus Input Voltage

Typical Output Ripple and Noise

Typical Start-Up and Output Rise Characteristic

Derating Output Load versus Ambient Temperature

Load Variation versus Output Voltage

Input Variation versus Output Voltage

TES 2-2412M
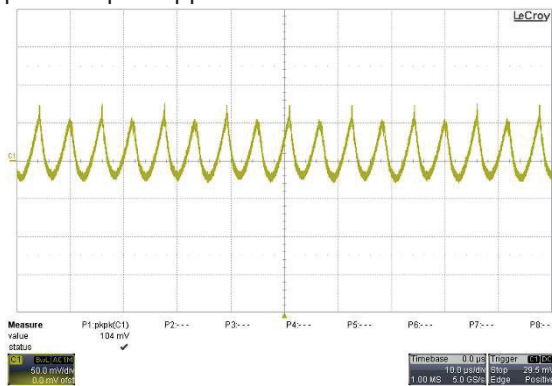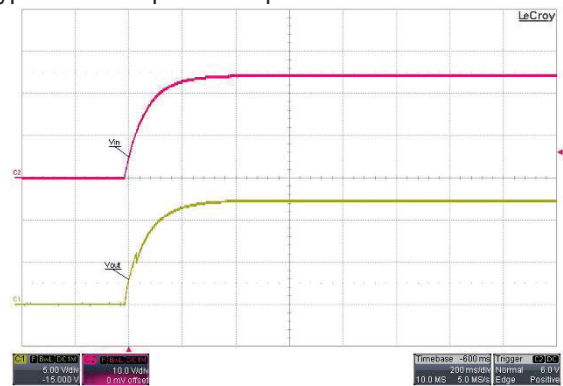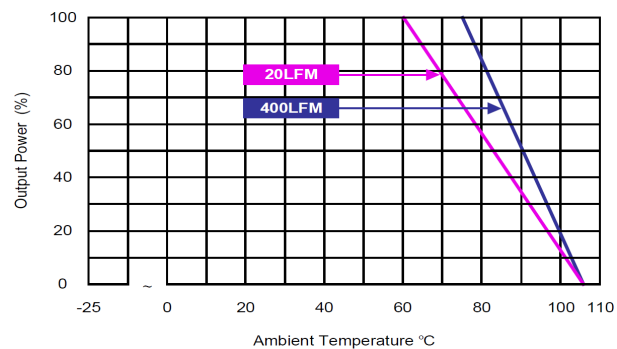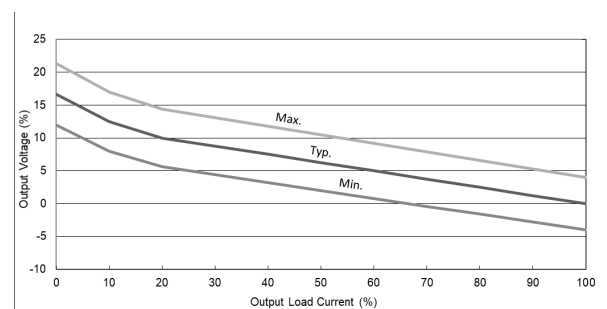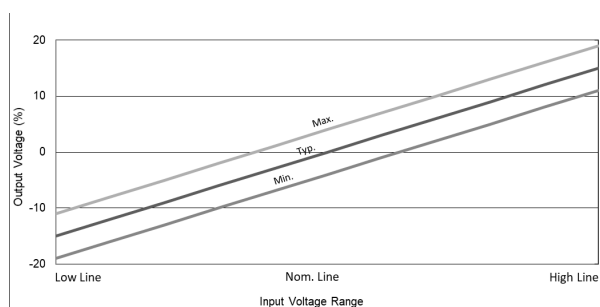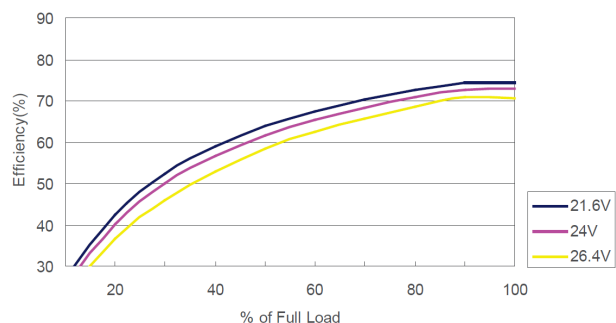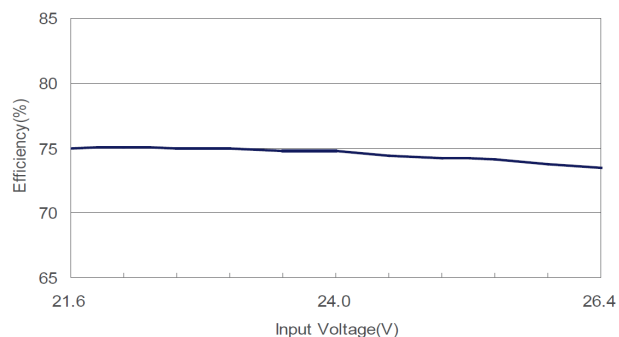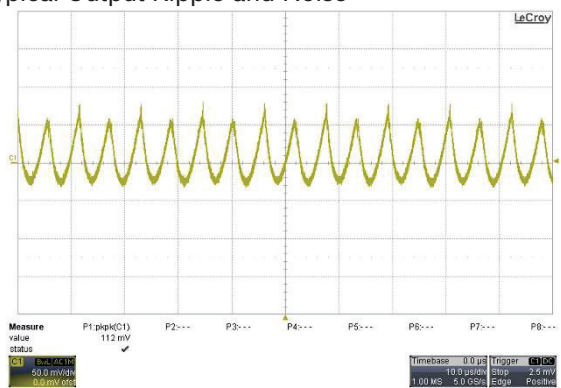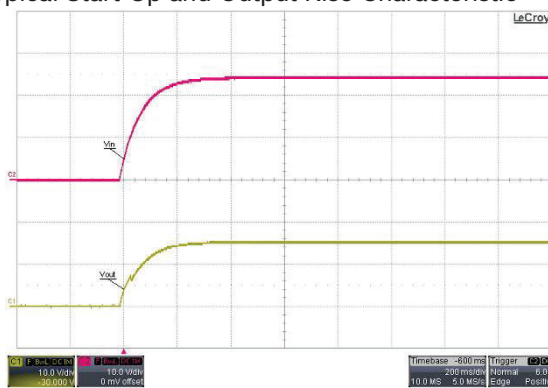
Efficiency versus Output Load

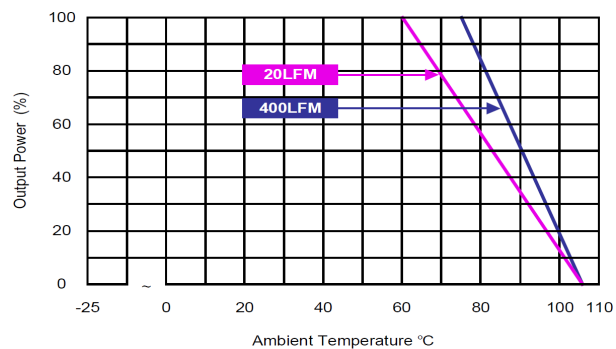

Efficiency versus Input Voltage

Typical Output Ripple and Noise
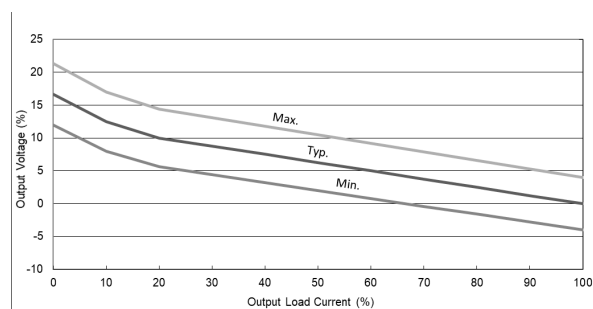

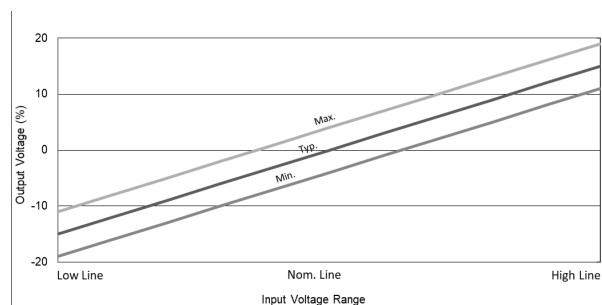### Typical Start-Up and Output Rise Characteristic

Derating Output Load versus Ambient Temperature

Load Variation versus Output Voltage

Input Variation versus Output Voltage

TES 2-2413M

Efficiency versus Output Load

Efficiency versus Input Voltage

Typical Output Ripple and Noise

Typical Start-Up and Output Rise Characteristic

Derating Output Load versus Ambient Temperature
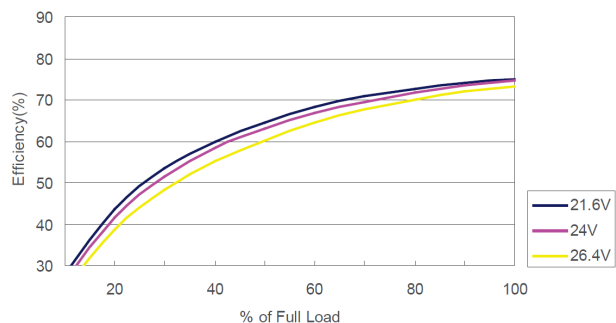

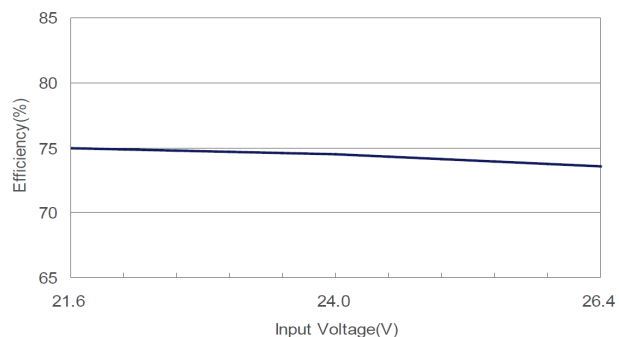### Load Variation versus Output Voltage

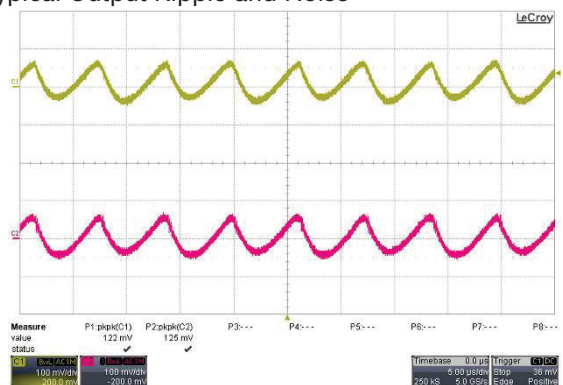

Input Variation versus Output Voltage
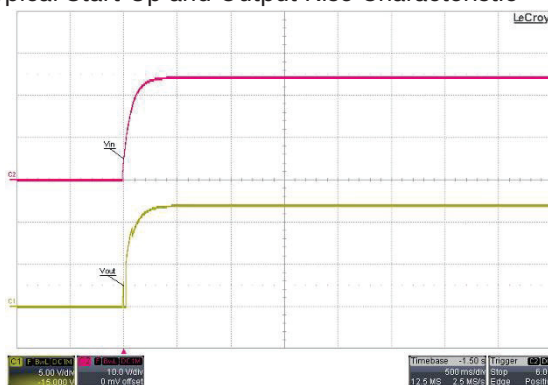
TES 2-2422M

Efficiency versus Output Load

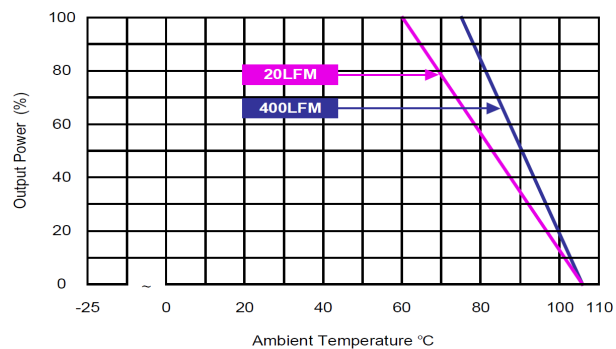### Efficiency versus Input Voltage

Typical Output Ripple and Noise
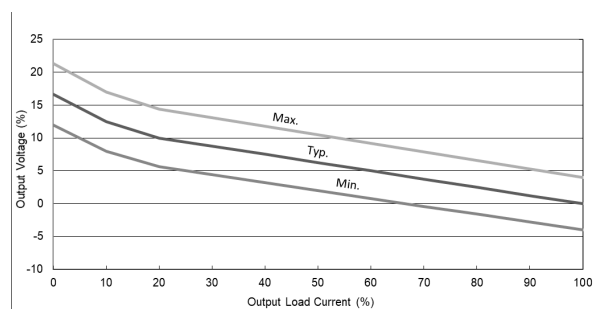

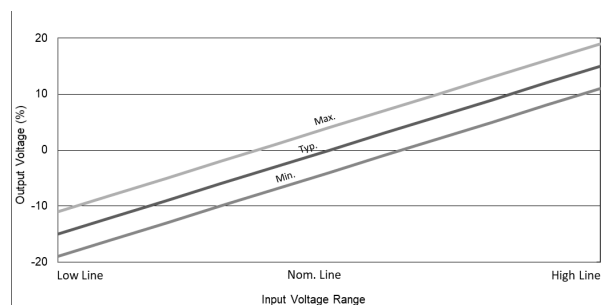### Typical Start-Up and Output Rise Characteristic

Derating Output Load versus Ambient Temperature
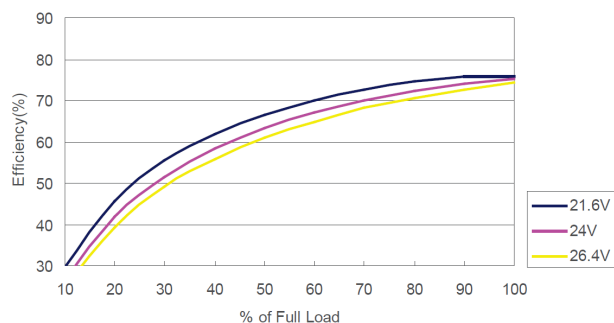

Load Variation versus Output Voltage

Input Variation versus Output Voltage

TES 2-2423M

Efficiency versus Output Load

Efficiency versus Input Voltage

Typical Output Ripple and Noise

Typical Start-Up and Output Rise Characteristic

Derating Output Load versus Ambient Temperature

Load Variation versus Output Voltage
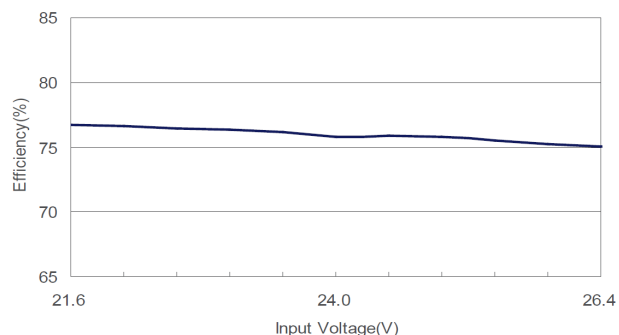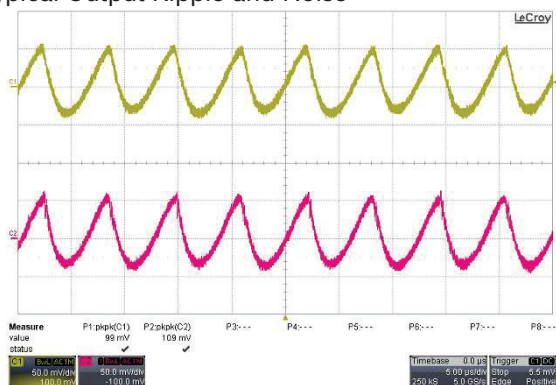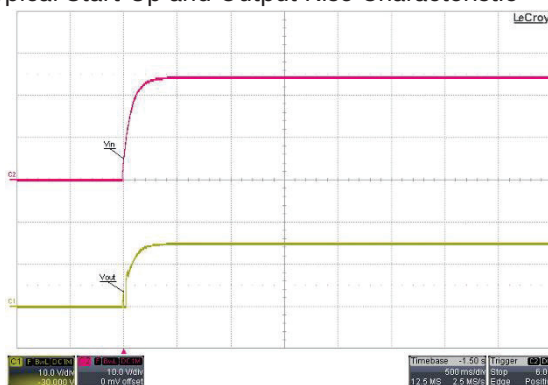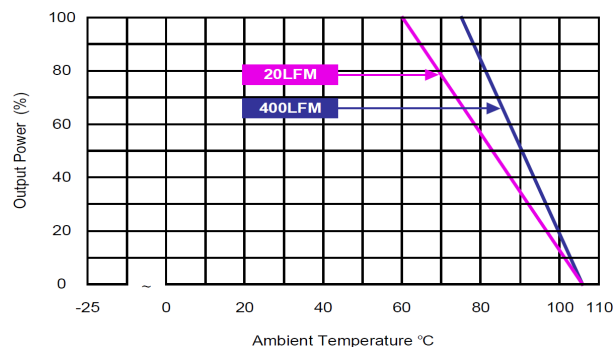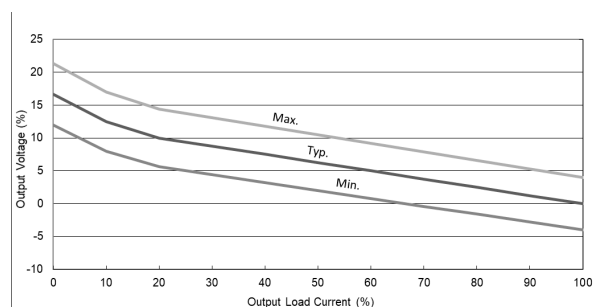

Input Variation versus Output Voltage

Specifications can be changed without notice!