GEN-1U 2.4kW

EVALUATION DATA

DWG: IA669-53-01		
APPD	CHK	DWG
21 Aug 2008	21/08/08	Ashev sh 21/08/08

NEMIC-LAMBDA LTD.

INDEX PAGE

TERMINOLOGY USED

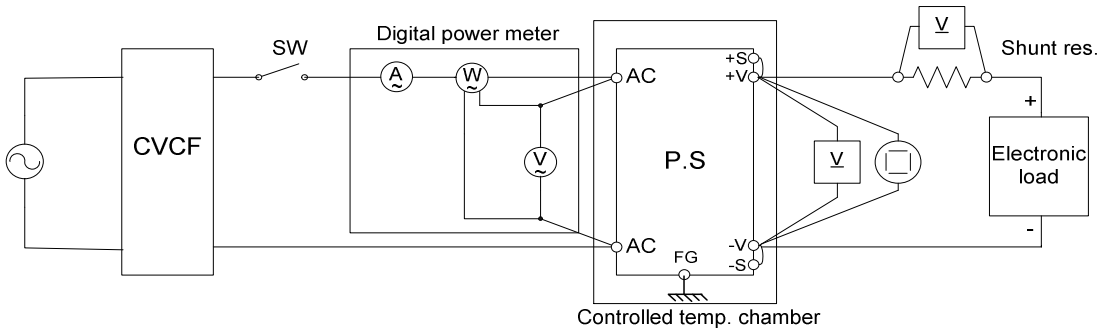
Definition

Vin	Input voltage
Vout	Output voltage
Iin	Input current
Iout	Output current
Ta	Ambient temperature
C.V	Constant voltage mode
C.C	Constant current mode

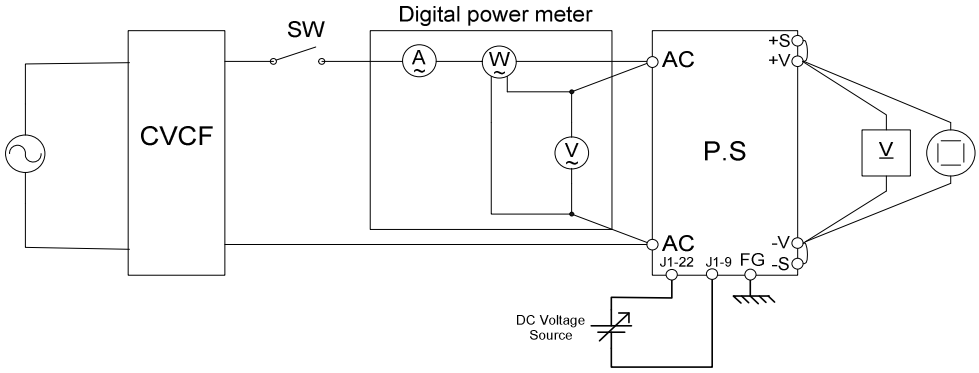
1. EVALUATION METHOD

1.1 Circuit used for determination

(1) Steady state data

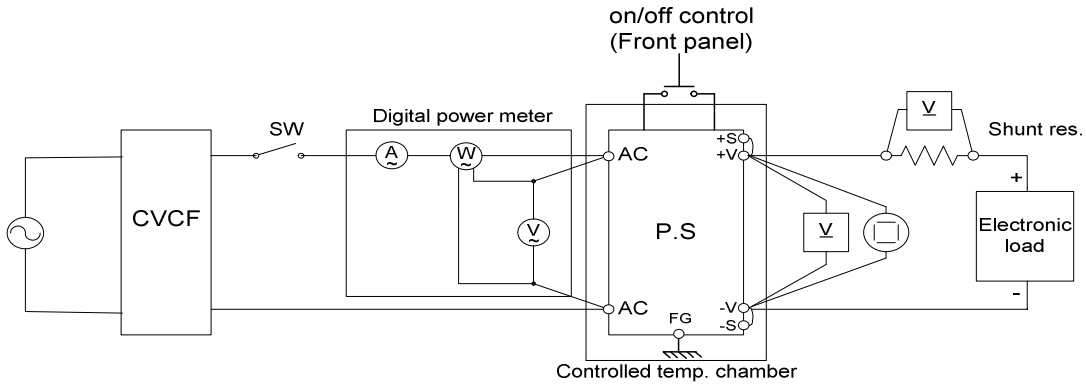


(2) Over voltage protection (OVP) characteristics

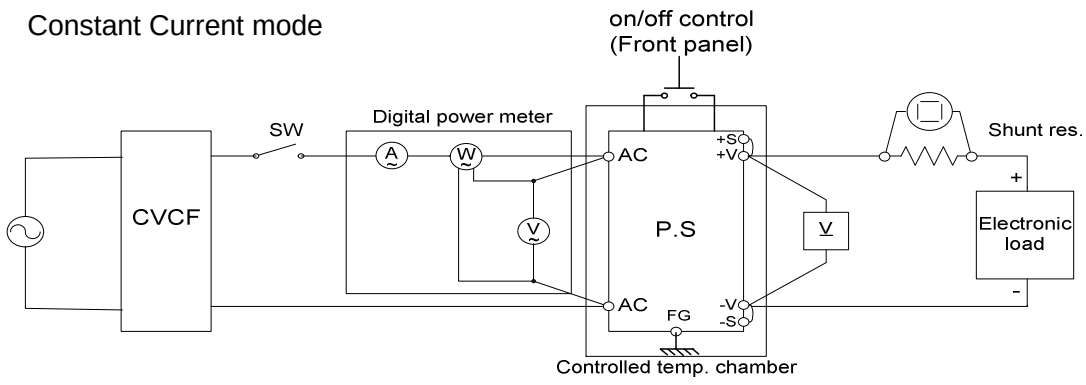


(3) Output rise/fall characteristics

Constant Voltage mode

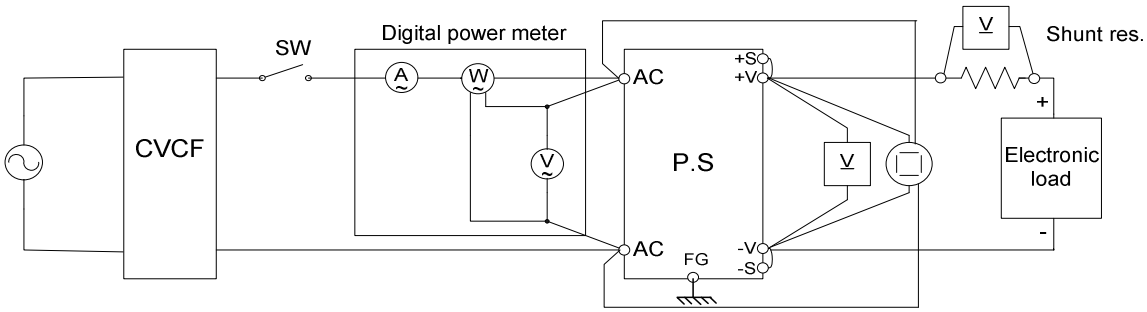


Constant Current mode

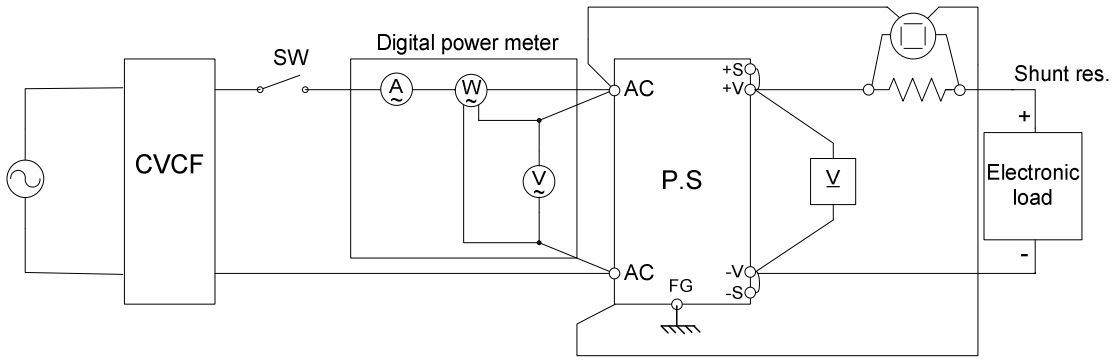


(4) Dynamic line response characteristics

Constant Voltage mode

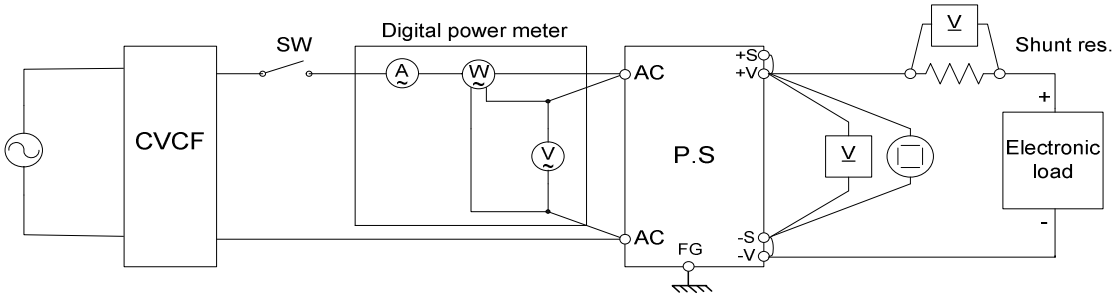


Constant Current mode



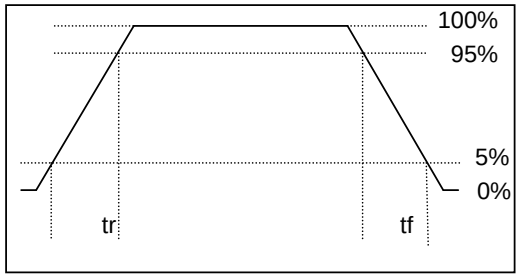
(5) Dynamic load response characteristics

Constant Voltage mode



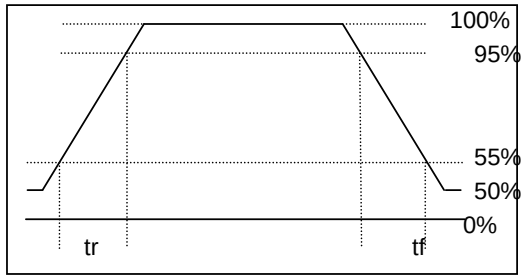
Output current waveform

Iout 0% <---> 100%



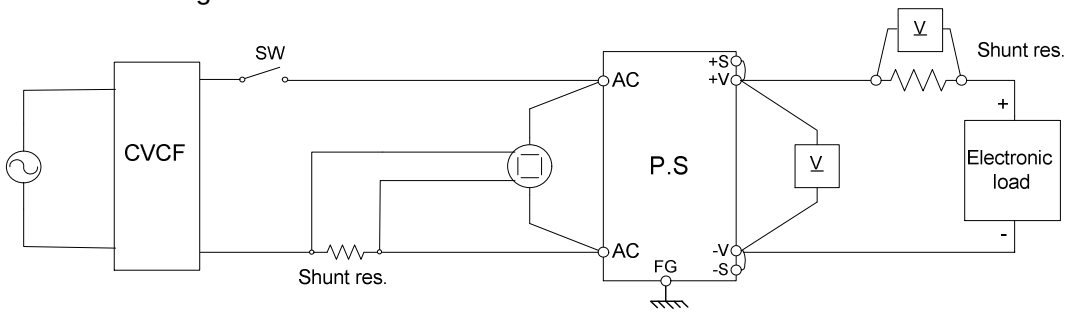
Output current waveform

Iout 50% <---> 100%

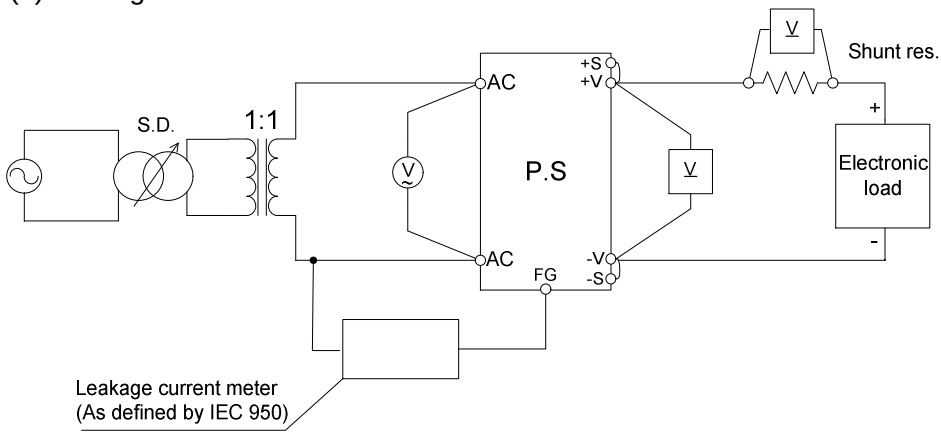


(6) Inrush current characteristics

Constant Voltage mode

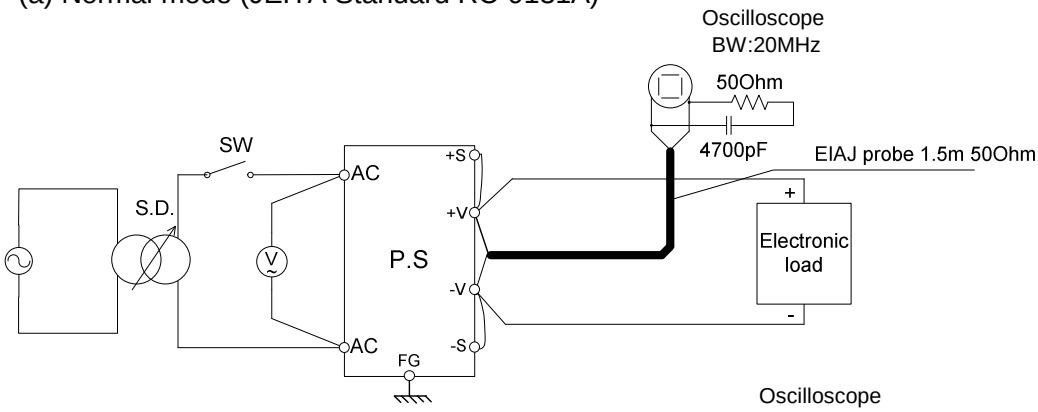


(7) Leakage current characteristics

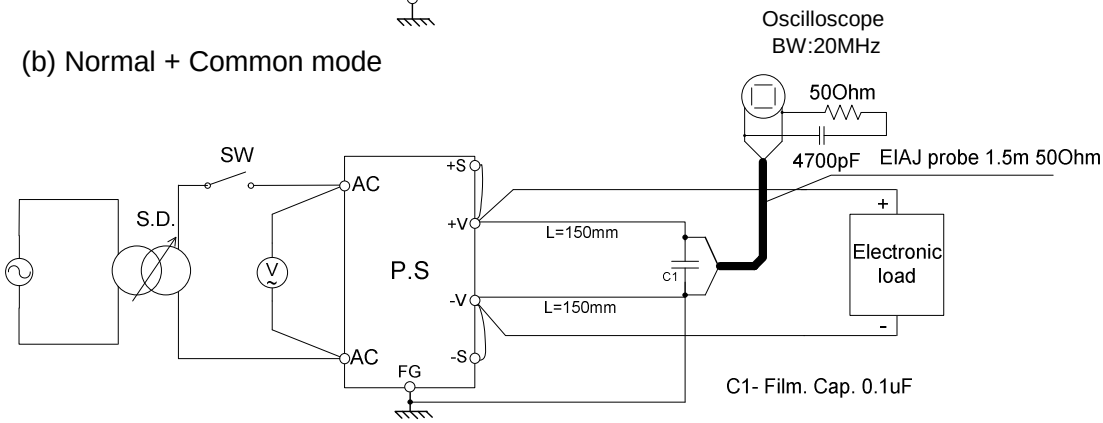


(8) Output ripple & noise waveform (8V to 300V models)

(a) Normal mode (JEITA Standard RC-9131A)

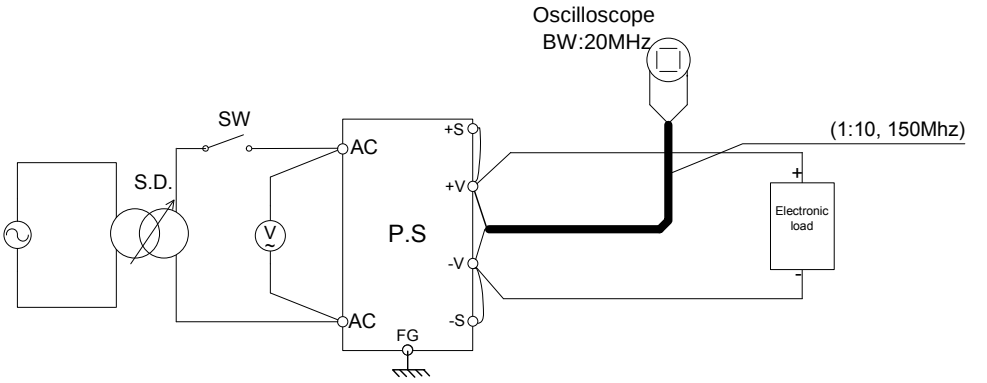


(b) Normal + Common mode

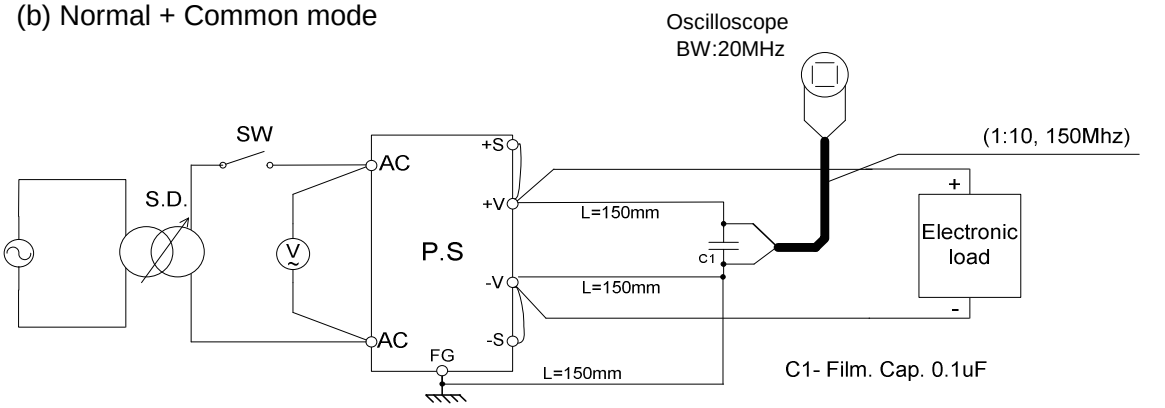


(9) Output ripple & noise waveform for 600V

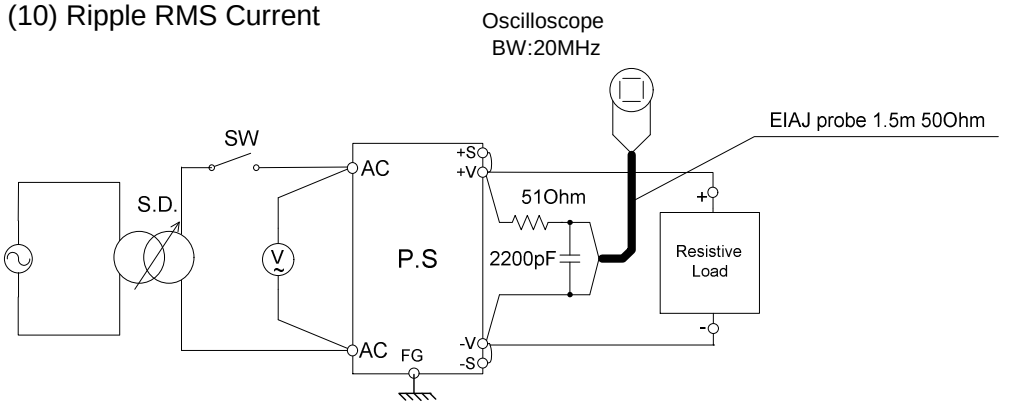
(a) Normal mode



(b) Normal + Common mode



(10) Ripple RMS Current



1.2 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL No.
1	Storage oscilloscope	YOKOGAWA	DL7100
2	Storage oscilloscope	YOKOGAWA	DL1740
3	Analog oscilloscope	HITACHI	V-1565
4	Digital multimeter	AGILENT	34401A
5	Digital power meter	YOKOGAWA	WT230
6	Autotransformer	METREL	HTN 450/30
7	AC Source	CHROMA	6590
8	Electronic load	H&H	ZS6060 SC150
9	Electronic load	H&H	ZS7006
10	Electronic load	H&H	ZS7060
11	Electronic load	CHROMA	63203
12	Electronic load	CHROMA	63206
13	Controlled temp. chamber	THERMOTRON	SM-16-3800
14	Controlled temp. chamber	THERMOTRON	SE-600-5-5
15	Controlled temp. chamber	THERMOTRON	SE-600-6-6
16	Leakage current tester	HIOKI	3155
17	Current probe	TEKTRONIX	P6021
18	Current probe	YOKOGAWA	701932

(1). Regulation - Line & Load, Temperature drift

GEN8-300

Conditions: Ta = 25℃

1. Regulation - Line & Load, C.V mode 1Φ200 (Readings in [V])

	Vin (AC)					
Vo	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	7.9992	7.9992	7.9992	7.9992	0	0.000
20%	7.9987	7.9987	7.9986	7.9986	0	0.000
40%	7.9981	7.9980	7.9980	7.9979	0	0.000
60%	7.9975	7.9974	7.9974	7.9973	0	0.000
80%	7.9968	7.9968	7.9967	7.9967	0	0.000
100%	7.9962	7.9961	7.9961	7.9960	0	0.000
Load	3.0	3.1	3.2	3.2	**ΔV(mV)**	**(%)**
Regulation	0.040	0.040	0.040	0.040	**(%)**	

2. Regulation - Line & Load, C.V mode 3Φ200 (Readings in [V])

	Vin (AC)					
Vo	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	8.0002	8.0002	8.0002	8.0002	0	0.000
19%	7.9998	7.9998	7.9998	7.9998	0	0.000
40%	7.9993	7.9993	7.9993	7.9993	0	0.000
60%	7.9989	7.9989	7.9989	7.9989	0	0.000
80%	7.9984	7.9984	7.9984	7.9984	0	0.000
100%	7.9980	7.9980	7.9980	7.9980	0	0.000
Load	2.2	2.2	2.3	2.2	**ΔV(mV)**	**(%)**
Regulation	0.030	0.030	0.030	0.030	**(%)**	

3. Temperature drift, C.V mode

Conditions: Vin:200V 3Φ
Iout:100%

Ta	0℃	25℃	50℃	Temp. Coefficient (0˚C~50˚C)	
Vout	7.995	7.993	7.991	3.8 mV	10 ppm/˚C

(1). Regulation - Line & Load, Temperature drift

GEN60-40

Conditions: Ta = 25℃

1. Regulation - Line & Load, C.V mode 1Φ200 (Readings in [V])

	Vin (AC)					
Vo	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	60.001	60.001	60.001	60.001	0	0.000
20%	60.001	60.001	60.001	60.001	0	0.000
40%	60.001	60.001	60.001	60.001	0	0.000
60%	60.001	60.001	60.001	60.001	0	0.000
80%	60.001	60.001	60.000	60.001	0	0.000
100%	60.001	60.001	60.001	60.001	0	0.000
Load Regulation	0.2	0.2	0.2	0.1	**ΔV(mV)**	**(%)**
	0.000	0.000	0.000	0.000	**(%)**	

2. Regulation - Line & Load, C.V mode 3Φ200 (Readings in [V])

	Vin (AC)					
Vo	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	60.002	60.002	60.002	60.002	0	0.000
20%	60.002	60.002	60.002	60.002	0	0.000
40%	60.002	60.002	60.002	60.002	0	0.000
60%	60.002	60.002	60.002	60.002	0	0.000
80%	60.002	60.002	60.002	60.002	0	0.000
100%	60.002	60.002	60.002	60.002	0	0.000
Load Regulation	0.2	0.1	0.1	0.5	**ΔV(mV)**	**(%)**
	0.000	0.000	0.000	0.000	**(%)**	

3. Temperature drift, C.V mode

Conditions: Vin:200V 3Φ
Iout:100%

Ta	0℃	25℃	50℃	Temp. Coefficient (0˚C~50˚C)	
Vout	60.011	60.000	59.991	20 mV	7 ppm/˚C

(1). Regulation - Line & Load, Temperature drift

GEN150-16

Conditions: Ta = 25℃

1. Regulation - Line & Load, C.V mode 1Φ200 (Readings in [V])

	Vin (AC)					
Vo	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	149.973	149.973	149.973	149.973	0	0.000
20%	149.972	149.972	149.972	149.972	0	0.000
40%	149.970	149.970	149.970	149.970	0	0.000
60%	149.969	149.969	149.969	149.969	0	0.000
80%	149.968	149.968	149.968	149.968	0	0.000
100%	149.967	149.967	149.967	149.967	0	0.000
Load	6.0	6.0	6.0	6.0	**ΔV(mV)**	**(%)**
Regulation	0.000	0.000	0.000	0.000	**(%)**	

2. Regulation - Line & Load, C.V mode 3Φ200 (Readings in [V])

	Vin (AC)					
Vo	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	149.996	149.996	149.996	149.996	0	0.000
20%	149.994	149.994	149.994	149.994	0	0.000
40%	149.993	149.993	149.993	149.993	0	0.000
60%	149.992	149.992	149.992	149.992	0	0.000
80%	149.991	149.991	149.991	149.991	0	0.000
100%	149.990	149.990	149.990	149.990	0	0.000
Load	6.0	6.0	6.0	6.0	**ΔV(mV)**	**(%)**
Regulation	0.000	0.000	0.000	0.000	**(%)**	

3. Temperature drift, C.V mode

Conditions: Vin:200V 3Φ
Iout:100%

Ta	0℃	25℃	50℃	Temp. Coefficient (0˚C~50˚C)	
Vout	150.016	149.983	149.954	62 mV	8 ppm/˚C

(1). Regulation - Line & Load, Temperature drift

GEN600-4

Conditions: Ta = 25℃

1. Regulation - Line & Load, C.V mode 1Φ200 (Readings in [V])

	Vin (AC)					
Vo	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	599.978	599.978	599.978	599.978	0	0.000
20%	599.977	599.977	599.977	599.977	0	0.000
40%	599.980	599.980	599.980	599.980	0	0.000
60%	599.977	599.977	599.977	599.977	0	0.000
80%	599.977	599.977	599.977	599.977	0	0.000
100%	599.981	599.981	599.981	599.981	0	0.000
Load	3.2	3.2	3.2	3.2	**ΔV(mV)**	**(%)**
Regulation	0.000	0.000	0.000	0.000	**(%)**	

2. Regulation - Line & Load, C.V mode 3Φ200 (Readings in [V])

	Vin (AC)					
Vo	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	599.851	599.851	599.851	599.851	0	0.000
20%	599.852	599.852	599.852	599.852	0	0.000
40%	599.852	599.852	599.852	599.852	0	0.000
60%	599.851	599.851	599.851	599.851	0	0.000
80%	599.851	599.851	599.851	599.851	0	0.000
100%	599.853	599.853	599.853	599.853	0	0.000
Load	1.8	2.2	1.8	1.5	**ΔV(mV)**	**(%)**
Regulation	0.000	0.000	0.000	0.000	**(%)**	

3. Temperature drift, C.V mode

Conditions: Vin:200V 3Φ
Iout:100%

Ta	0℃	25℃	50℃	Temp. Coefficient (0˚C~50˚C)	
Vout	600.106	600.096	600.124	27.81 mV	1 ppm/˚C

(1). Regulation - Line & Load, Temperature drift

GEN8-300

Conditions: Ta = 25℃

1. Regulation - Line & Load, C.C mode 1Φ200 (*) (Readings in [A])

	Vin (AC)					
Io	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	300.021	300.021	300.021	300.021	0	0.000
20%	300.020	300.020	300.020	300.020	0	0.000
40%	300.017	300.017	300.017	300.017	0	0.000
60%	300.012	300.012	300.012	300.012	0	0.000
80%	300.010	300.010	300.010	300.010	0	0.000
100%	300.009	300.009	300.009	300.009	0	0.000
Load	12.6	12.6	12.6	12.6	**ΔI(mA)**	**(%)**
Regulation	0.004	0.004	0.004	0.004	**(%)**	

2. Regulation - Line & Load, C.C mode 3Φ200 (*) (Readings in [A])

	Vin (AC)					
Io	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	300.023	300.023	300.023	300.023	0	0.000
19%	300.021	300.021	300.021	300.021	0	0.000
40%	300.019	300.019	300.019	300.019	0	0.000
60%	300.016	300.016	300.016	300.016	0	0.000
80%	300.013	300.013	300.013	300.013	0	0.000
100%	300.012	300.012	300.012	300.012	0	0.000
Load	11.2	11.2	11.2	11.2	**ΔI(mA)**	**(%)**
Regulation	0.000	0.000	0.000	0.000	**(%)**	

3. Temperature drift, C.C mode

Conditions: Vin:200V 3Φ
Iout:100%

Ta	0℃	25℃	50℃	Temp. Coefficient (0˚C~50˚C)	
Iout	299.650	299.748	299.922	271.764 mA	18 ppm/˚C

Notes:
(*) Not including load regulation thermal drift effect.

(1). Regulation - Line & Load, Temperature drift

GEN60-40

Conditions: Ta = 25℃

1. Regulation - Line & Load, C.C mode 1Φ200 (*) (Readings in [A])

	Vin (AC)					
Io	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	40.001	40.001	40.001	40.001	0	0.000
20%	40.001	40.001	40.001	40.001	0	0.000
40%	40.001	40.001	40.001	40.001	0	0.000
60%	40.001	40.001	40.001	40.001	0	0.000
80%	40.000	40.000	40.000	40.000	0	0.000
100%	40.000	40.000	40.000	40.000	0	0.000
Load Regulation	1.0	1.0	1.0	1.0	**ΔI(mA)**	**(%)**
	0.000	0.000	0.000	0.000	**(%)**	

2. Regulation - Line & Load, C.C mode 3Φ200 (*) (Readings in [A])

	Vin (AC)					
Io	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	39.985	39.985	39.985	39.985	0	0.000
20%	39.985	39.985	39.985	39.985	0	0.000
40%	39.984	39.984	39.984	39.984	0	0.000
60%	39.984	39.984	39.984	39.984	0	0.000
80%	39.983	39.983	39.983	39.983	0	0.000
100%	39.983	39.983	39.983	39.983	0	0.000
Load Regulation	1.8	1.8	1.8	2.1	**ΔI(mA)**	**(%)**
	0.000	0.000	0.000	0.010	**(%)**	

3. Temperature drift, C.C mode

Conditions: Vin:200V 3Φ
Iout:100%

Ta	0℃	25℃	50℃	Temp. Coefficient (0˚C~50˚C)	
Iout	39.999	39.988	39.999	11 mA	6 ppm/˚C

Notes:
(*) Not including load regulation thermal drift effect.

(1). Regulation - Line & Load, Temperature drift

GEN150-16

Conditions: Ta = 25℃

1. Regulation - Line & Load, C.C mode 1Φ200 (*) (Readings in [A])

	Vin (AC)					
Io	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	15.997	15.997	15.997	15.998	0	0.000
20%	15.996	15.996	15.996	15.996	0	0.000
40%	15.996	15.996	15.996	15.996	0	0.000
60%	15.996	15.996	15.996	15.997	0	0.000
80%	15.996	15.996	15.996	15.996	0	0.000
100%	15.995	15.995	15.995	15.996	0	0.000
Load	2.1	2.0	2.0	1.9	**ΔI(mA)**	**(%)**
Regulation	0.010	0.010	0.010	0.010	**(%)**	

2. Regulation - Line & Load, C.C mode 3Φ200 (*) (Readings in [A])

	Vin (AC)					
Io	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	15.953	15.953	15.953	15.953	0	0.000
20%	15.953	15.953	15.953	15.953	0	0.000
40%	15.953	15.953	15.953	15.953	0	0.000
60%	15.952	15.952	15.952	15.952	0	0.000
80%	15.952	15.952	15.952	15.952	0	0.000
100%	15.952	15.952	15.952	15.952	0	0.000
Load	0.9	0.9	0.9	0.9	**ΔI(mA)**	**(%)**
Regulation	0.010	0.010	0.010	0.010	**(%)**	

3. Temperature drift, C.C mode

Conditions: Vin:200V 3Φ
Iout:100%

Ta	0℃	25℃	50℃	Temp. Coefficient (0˚C~50˚C)	
Iout	15.966	15.957	15.953	12.4 mA	16 ppm/˚C

Notes:
(*) Not including load regulation thermal drift effect.

(1). Regulation - Line & Load, Temperature drift

GEN600-4

Conditions: Ta = 25℃

1. Regulation - Line & Load, C.C mode 1Φ200 (*) (Readings in [A])

	Vin (AC)					
Io	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	3.999	3.999	3.999	3.999	0	0.000
20%	3.999	3.999	3.999	3.999	0	0.000
40%	3.998	3.998	3.998	3.998	0	0.000
60%	3.998	3.998	3.998	3.998	0	0.000
80%	3.997	3.997	3.997	3.997	0	0.000
100%	3.996	3.996	3.996	3.996	0	0.000
Load	3.1	3.0	3.0	3.1	**ΔI(mA)**	**(%)**
Regulation	0.080	0.080	0.080	0.080	**(%)**	

2. Regulation - Line & Load, C.C mode 3Φ200 (*) (Readings in [A])

	Vin (AC)					
Io	**170**	**200**	**230**	**265**	**Line Regulation**	
0%	4.001	4.001	4.001	4.001	0	0.000
20%	3.997	3.997	3.997	3.997	0	0.000
40%	3.997	3.997	3.997	3.997	0	0.000
60%	3.997	3.997	3.997	3.997	0	0.000
80%	3.996	3.996	3.996	3.996	0	0.000
100%	3.996	3.996	3.996	3.996	0	0.000
Load	4.8	4.8	4.8	4.8	**ΔI(mA)**	**(%)**
Regulation	0.120	0.120	0.120	0.120	**(%)**	

3. Temperature drift, C.C mode

Conditions: Vin:200V 3Φ
Iout:100%

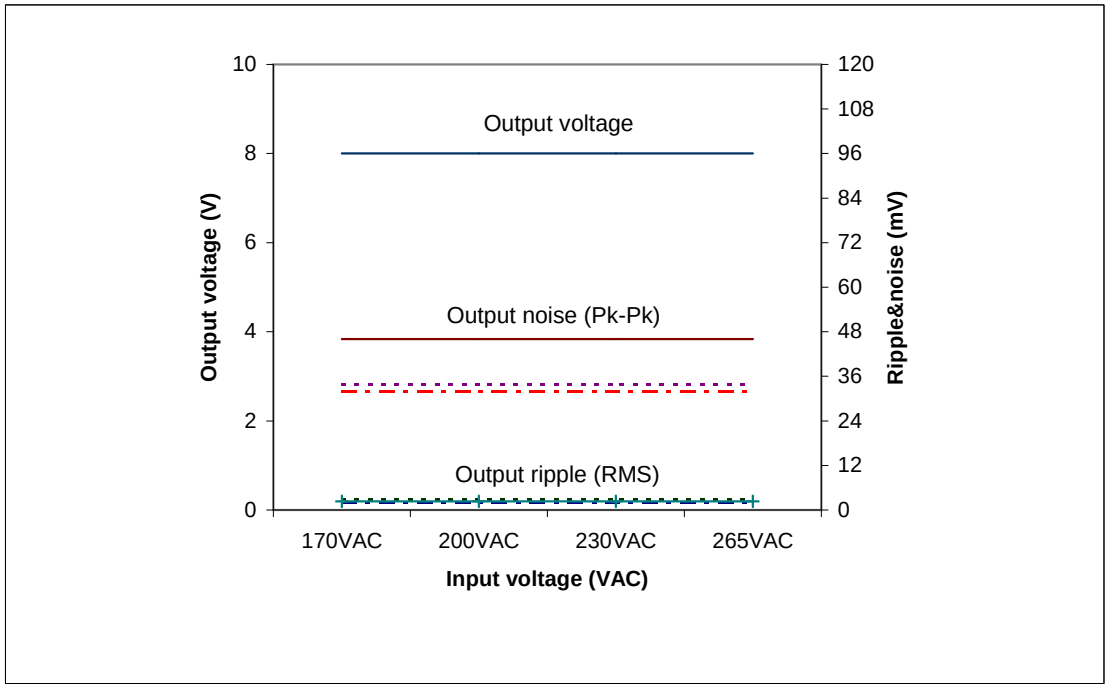
Ta	0℃	25℃	50℃	Temp. Coefficient (0˚C~50˚C)	
Iout	3.992	3.991	3.993	2.3 mA	12 ppm/˚C

Notes:
(*) Not including load regulation thermal drift effect.

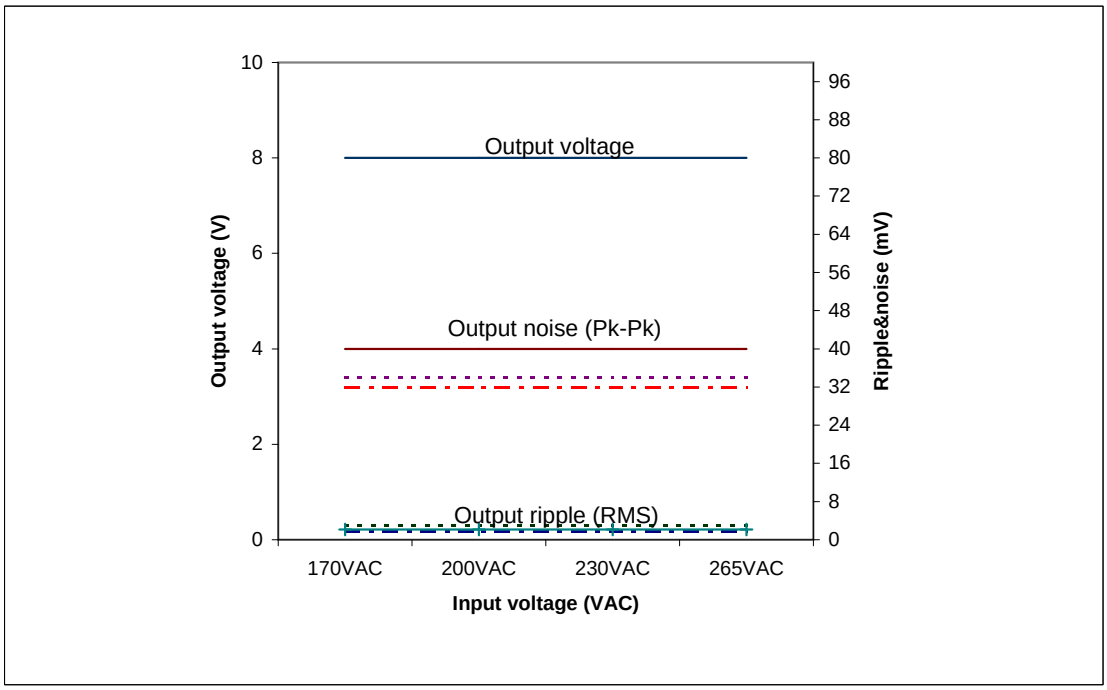
(2). Output voltage and ripple voltage v.s input voltage
C.V mode

Conditions: Iout:100%
Ta: 0˚C
25˚C
50˚C

GEN8-300 1Φ 200



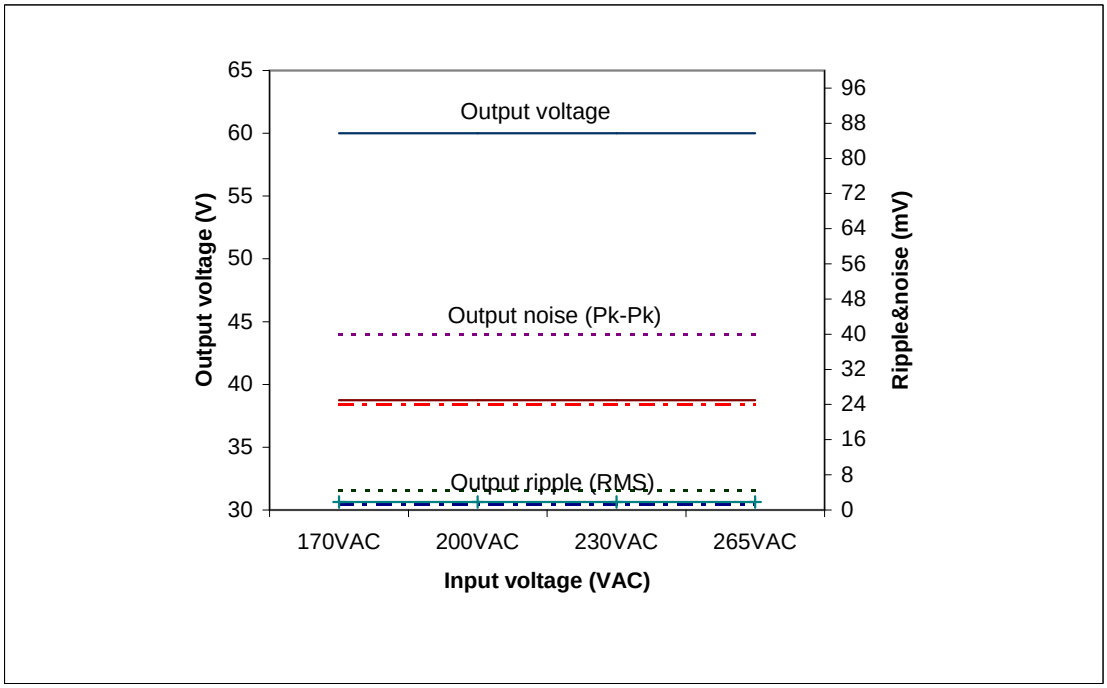
GEN8-300 3Φ 200



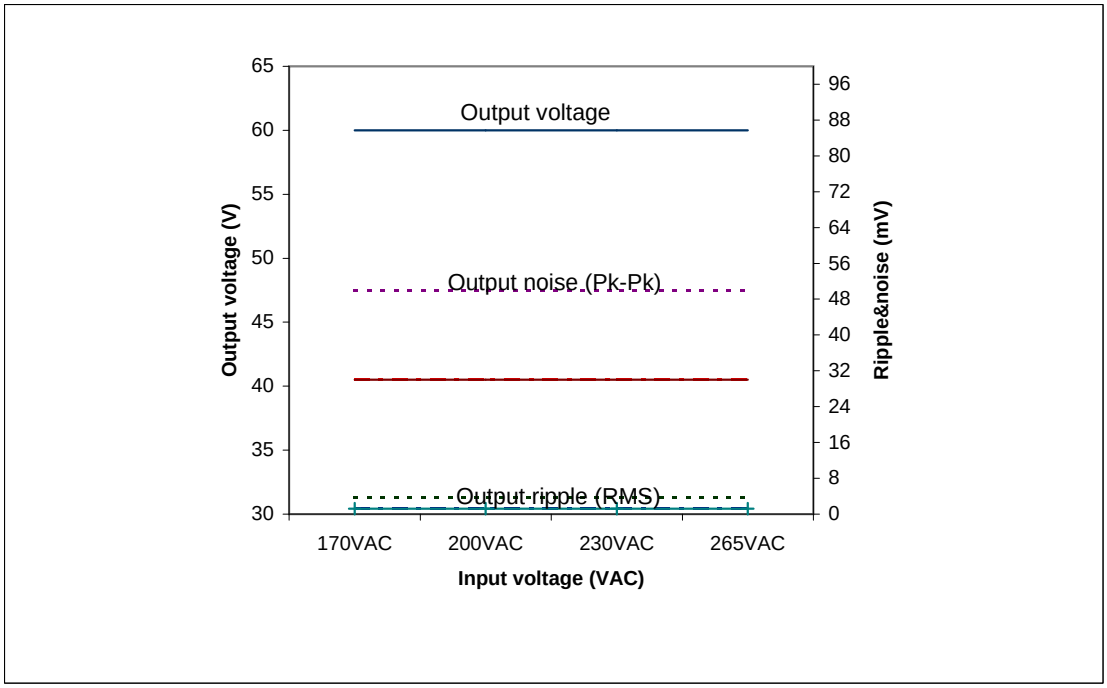
(2). Output voltage and ripple voltage v.s input voltage
C.V mode

Conditions: Iout:100%
Ta: 0˚C
25˚C
50˚C

GEN60-40 1Φ 200



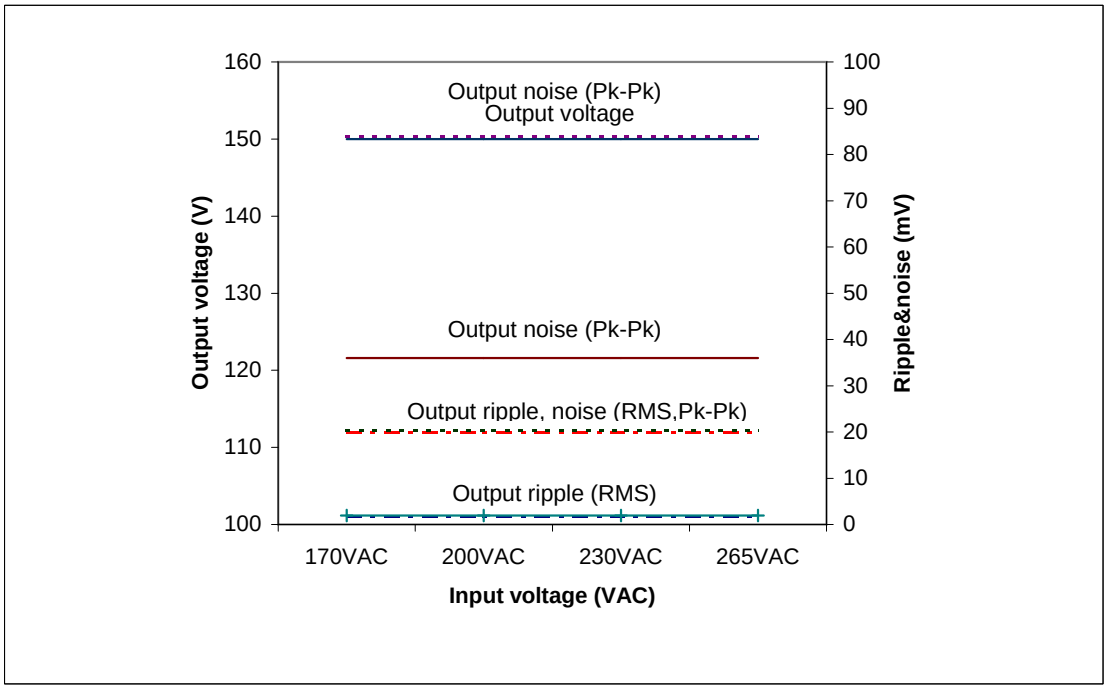
GEN60-40 3Φ 200



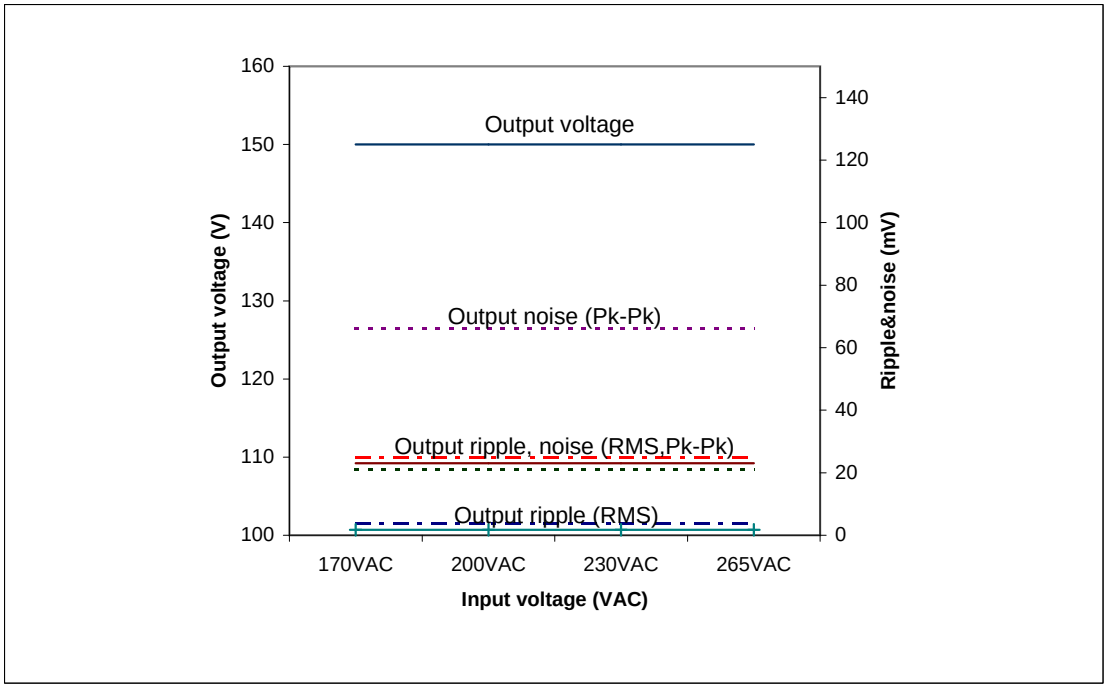
(2). Output voltage and ripple voltage v.s input voltage
C.V mode

Conditions: Iout:100%
Ta: 0˚C
25˚C
50˚C

GEN150-16 1Φ 200



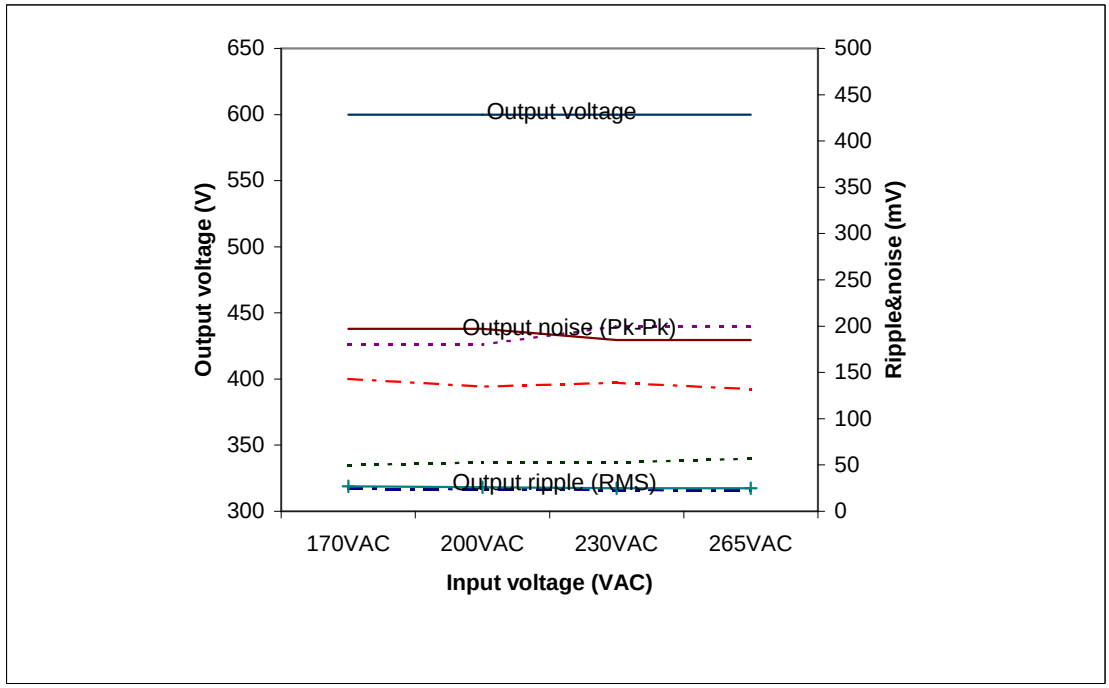
GEN150-16 3Φ 200



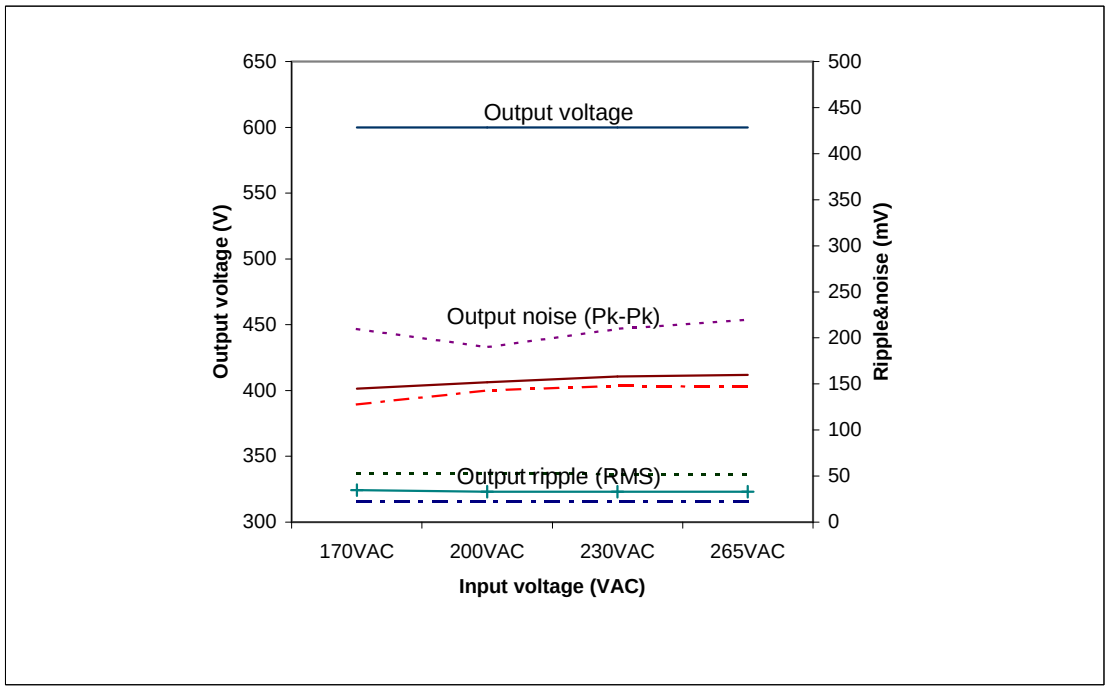
(2). Output voltage and ripple voltage v.s input voltage
C.V mode

Conditions: Iout:100%
Ta: 0˚C
25˚C
50˚C

GEN600-4 1Φ 200



GEN600-4 3Φ 200

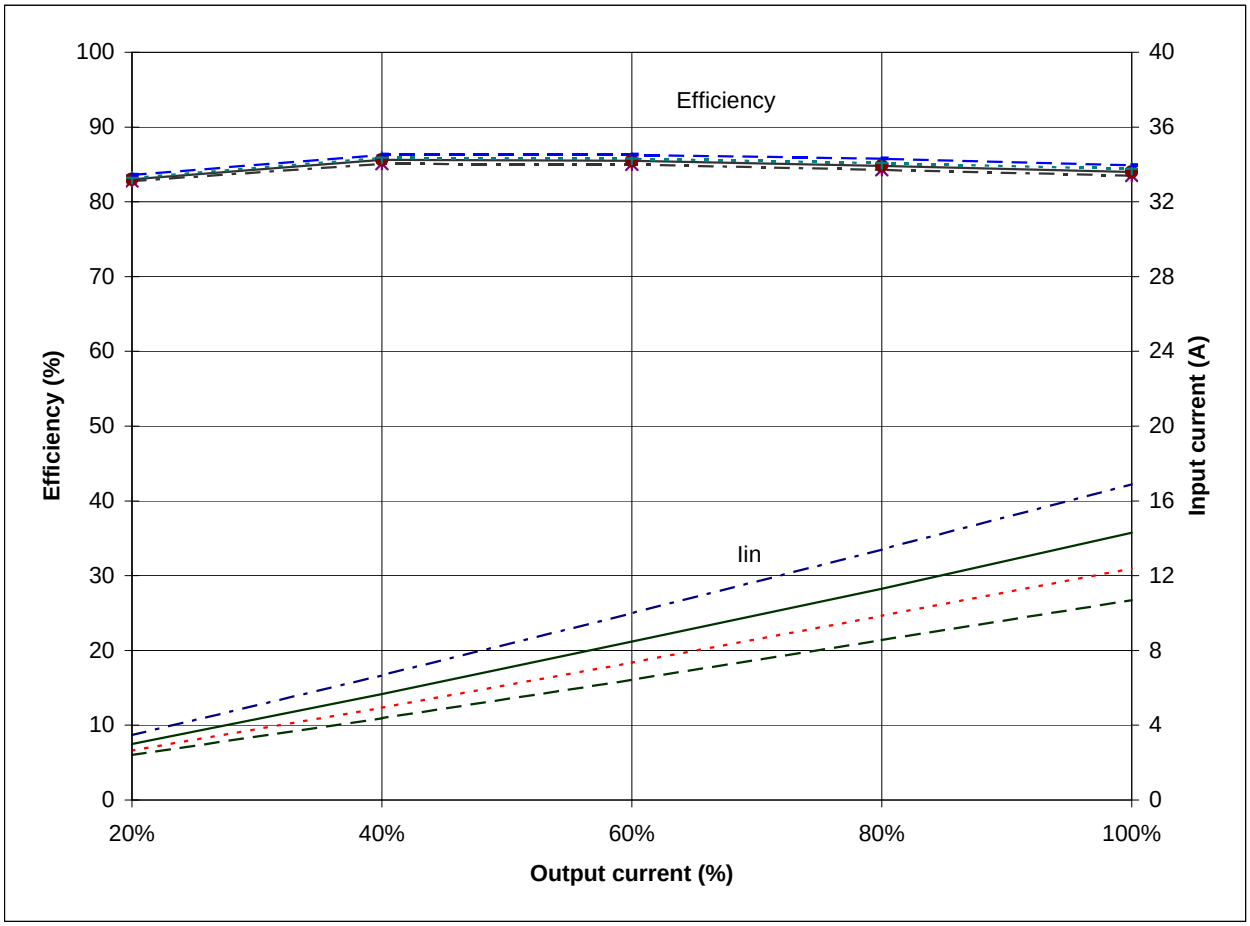


(3). Efficiency and Input current vs. Output current

Conditions:

Vin: 170 VAC
200 VAC
230 VAC
265 VAC
Vout:100%
Ta: 25˚C

GEN8-300 1Φ 200

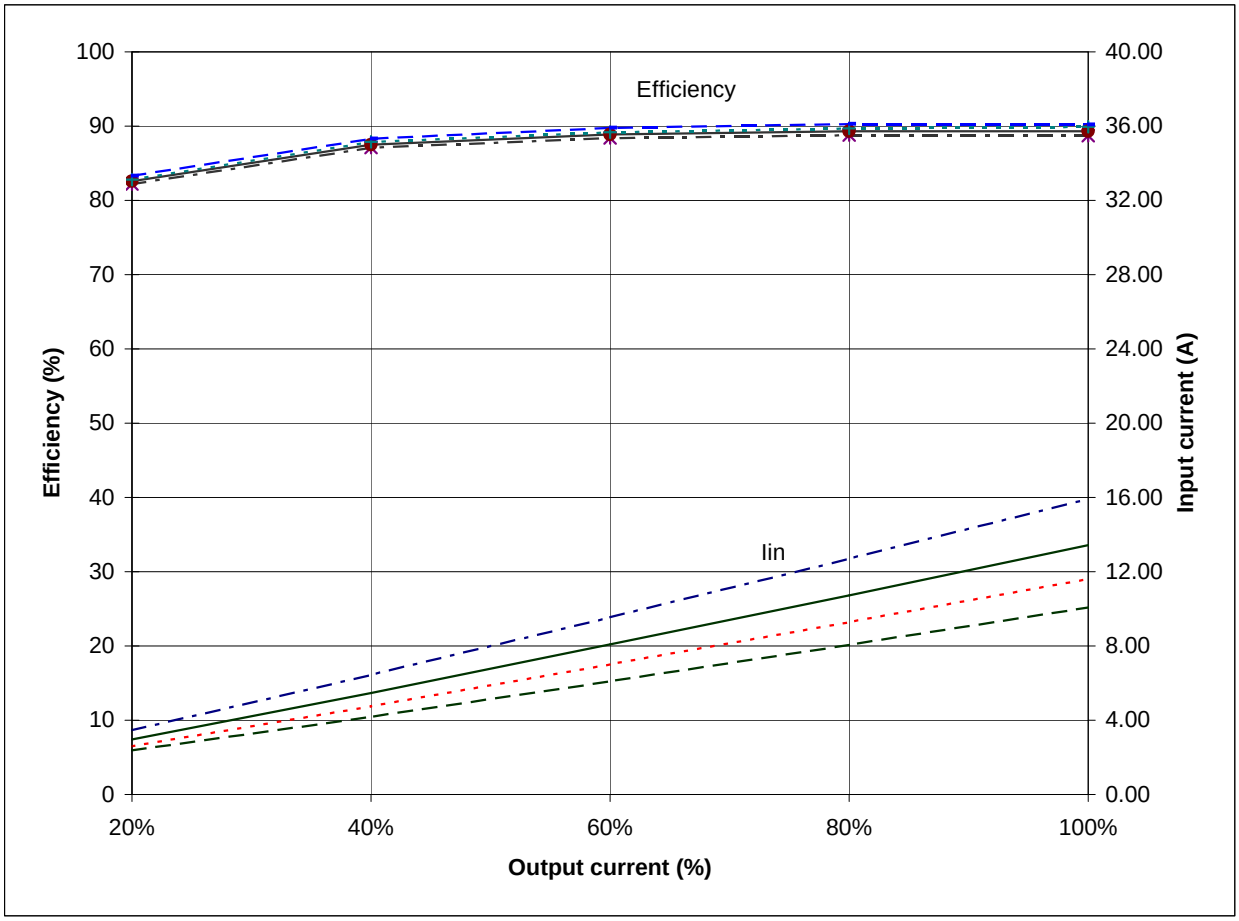


(3). Efficiency and Input current vs. Output current

Conditions:

Vin: 170 VAC
200 VAC
230 VAC
265 VAC
Vout:100%
Ta: 25˚C

GEN60-40 1Φ 200

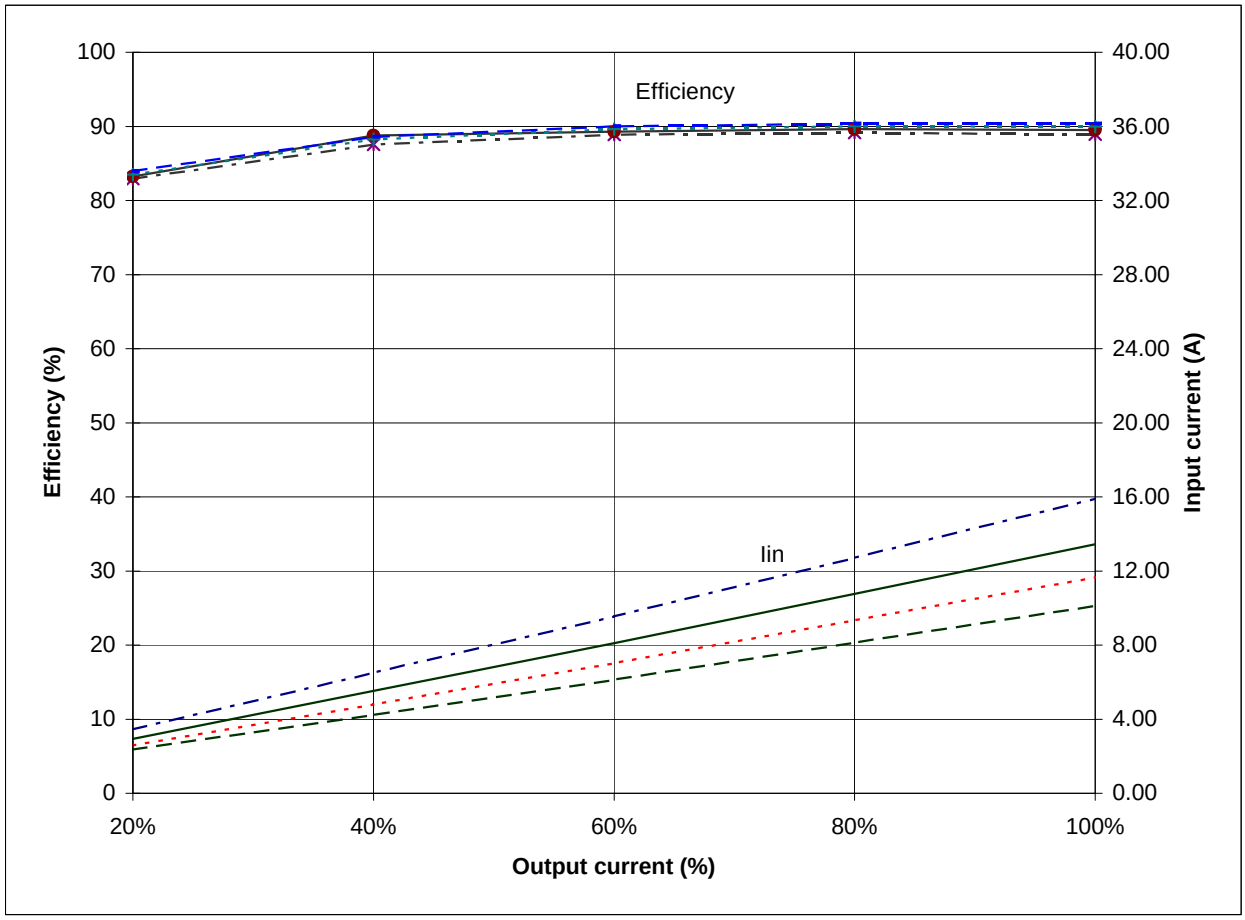


(3). Efficiency and Input current vs. Output current

Conditions:

Vin: 170 VAC
200 VAC
230 VAC
265 VAC
Vout:100%
Ta: 25˚C

GEN150-16 1Φ 200

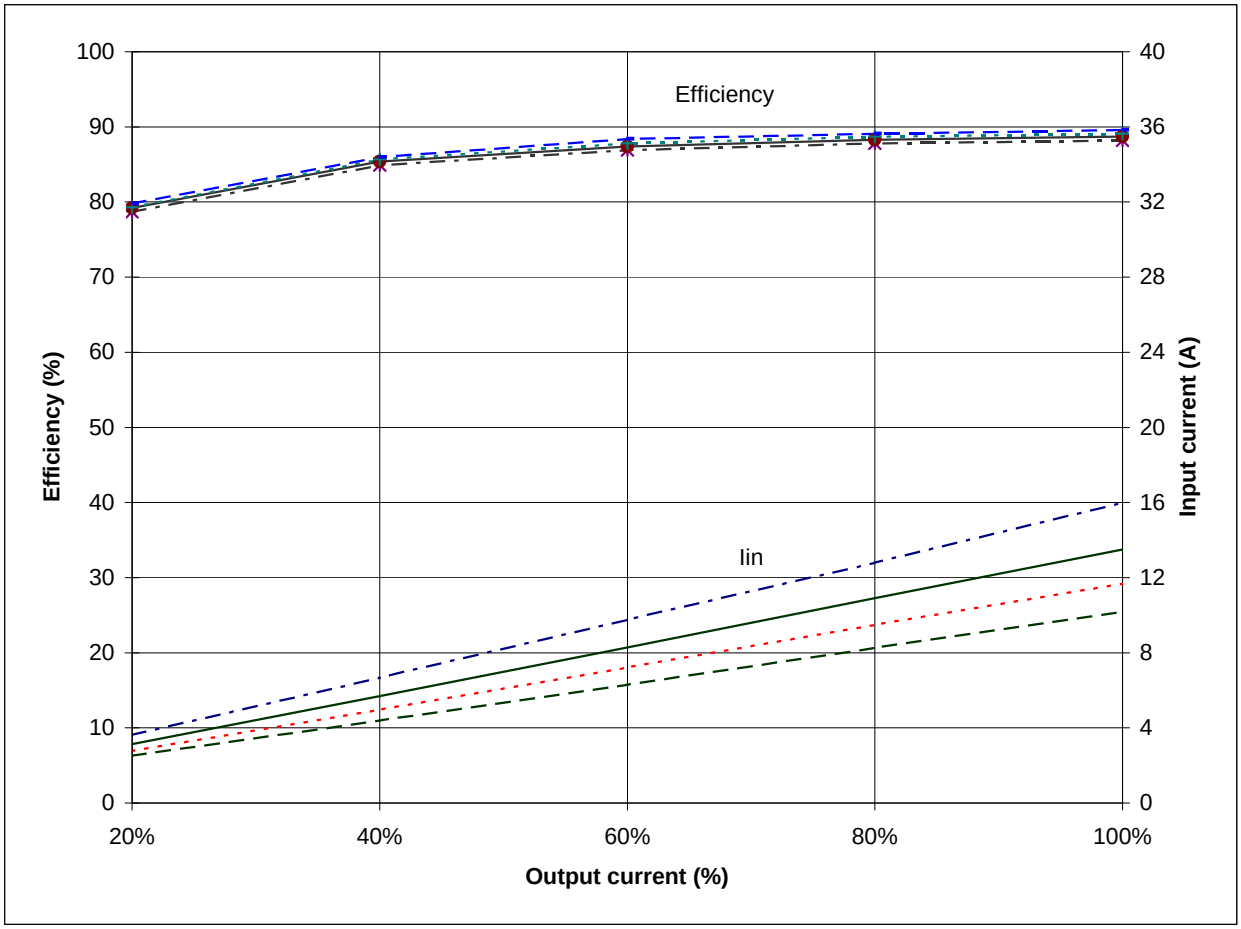


(3). Efficiency and Input current vs. Output current

Conditions:

Vin: 170 VAC
200 VAC
230 VAC
265 VAC
Vout:100%
Ta: 25˚C

GEN600-4 1Φ 200

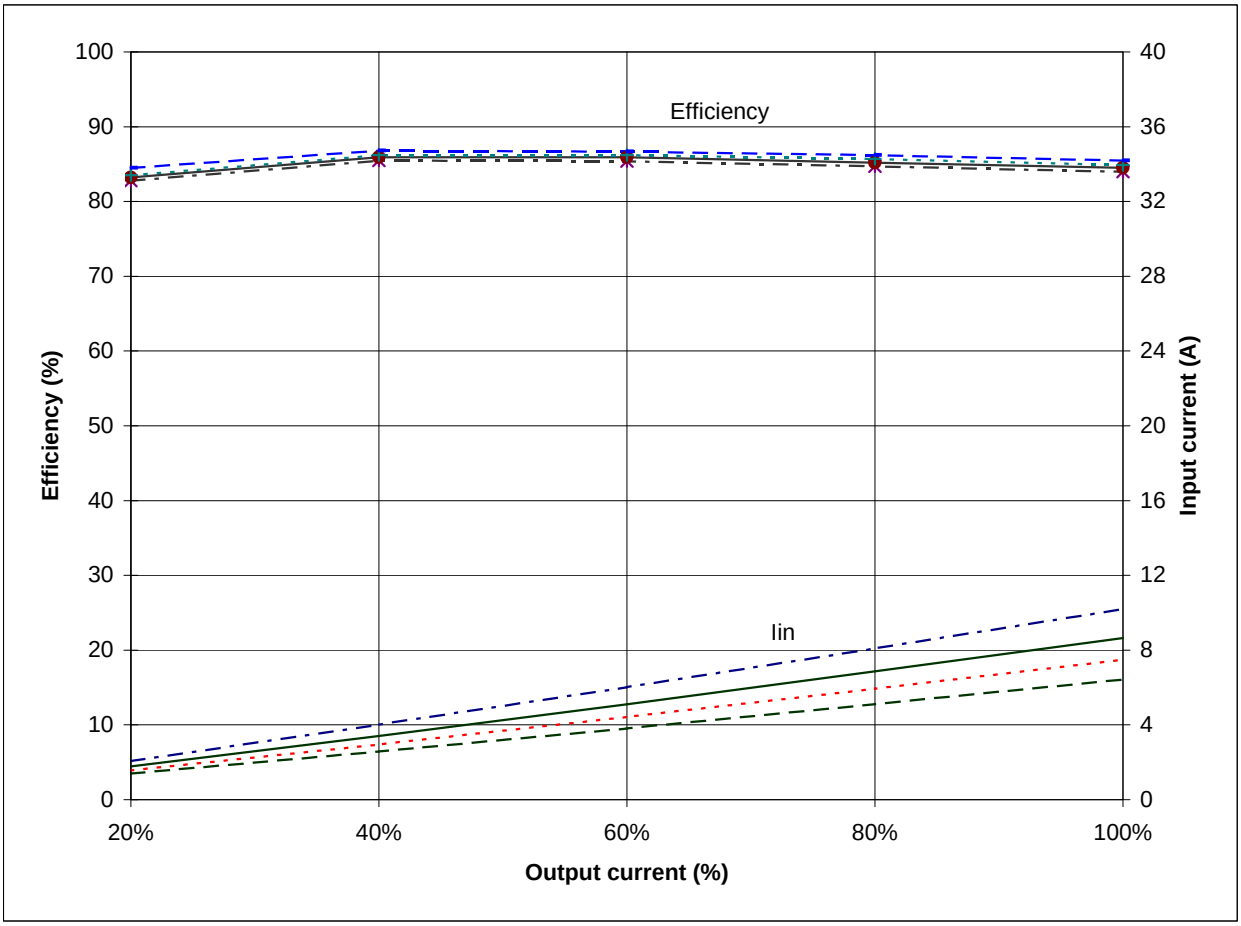


(3). Efficiency and Input current vs. Output current

Conditions:

Vin: 170 VAC
200 VAC
230 VAC
265 VAC
Vout:100%
Ta: 25˚C

GEN8-300 3Φ 200

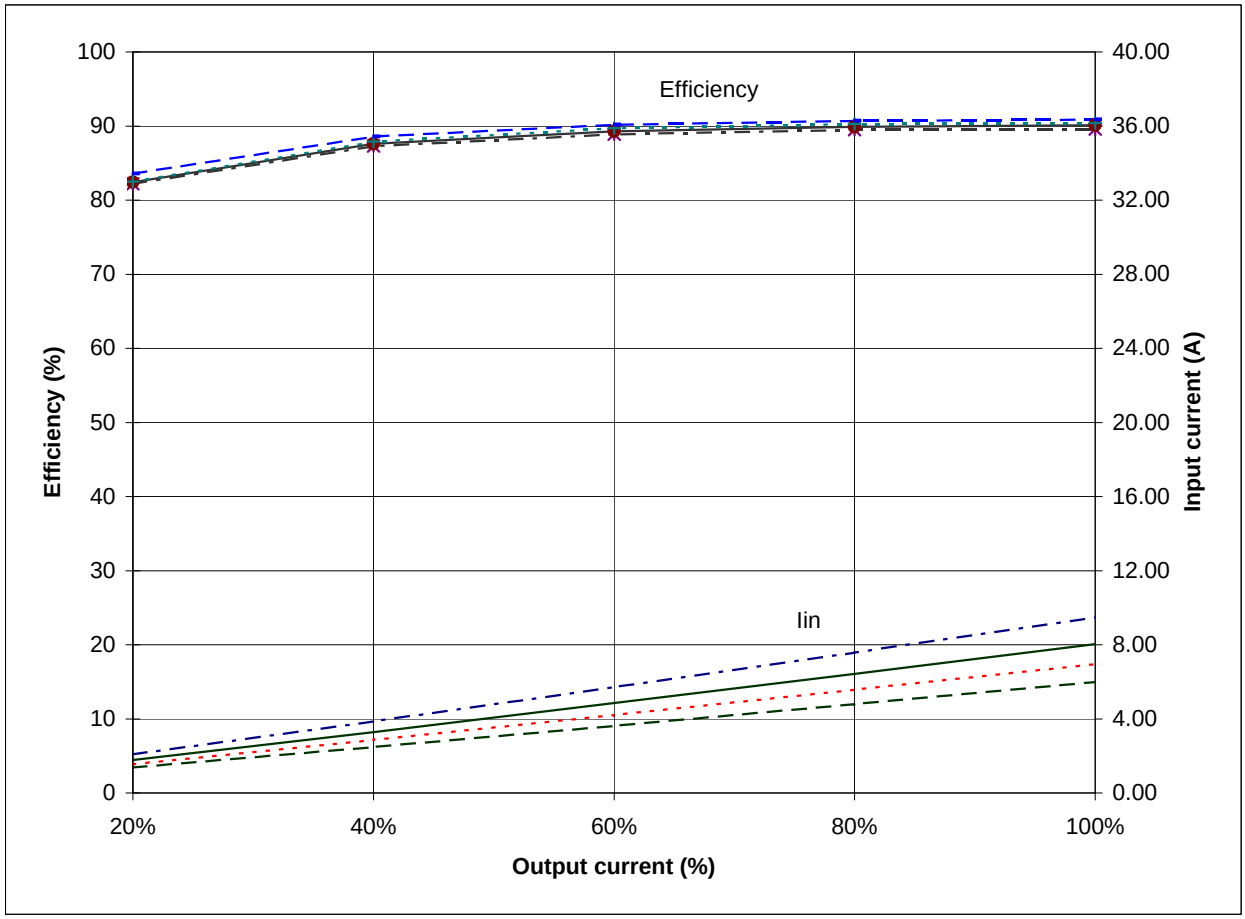


(3). Efficiency and Input current vs. Output current

Conditions:

Vin: 170 VAC
200 VAC
230 VAC
265 VAC
Vout:100%
Ta: 25˚C

GEN60-40 3Φ 200

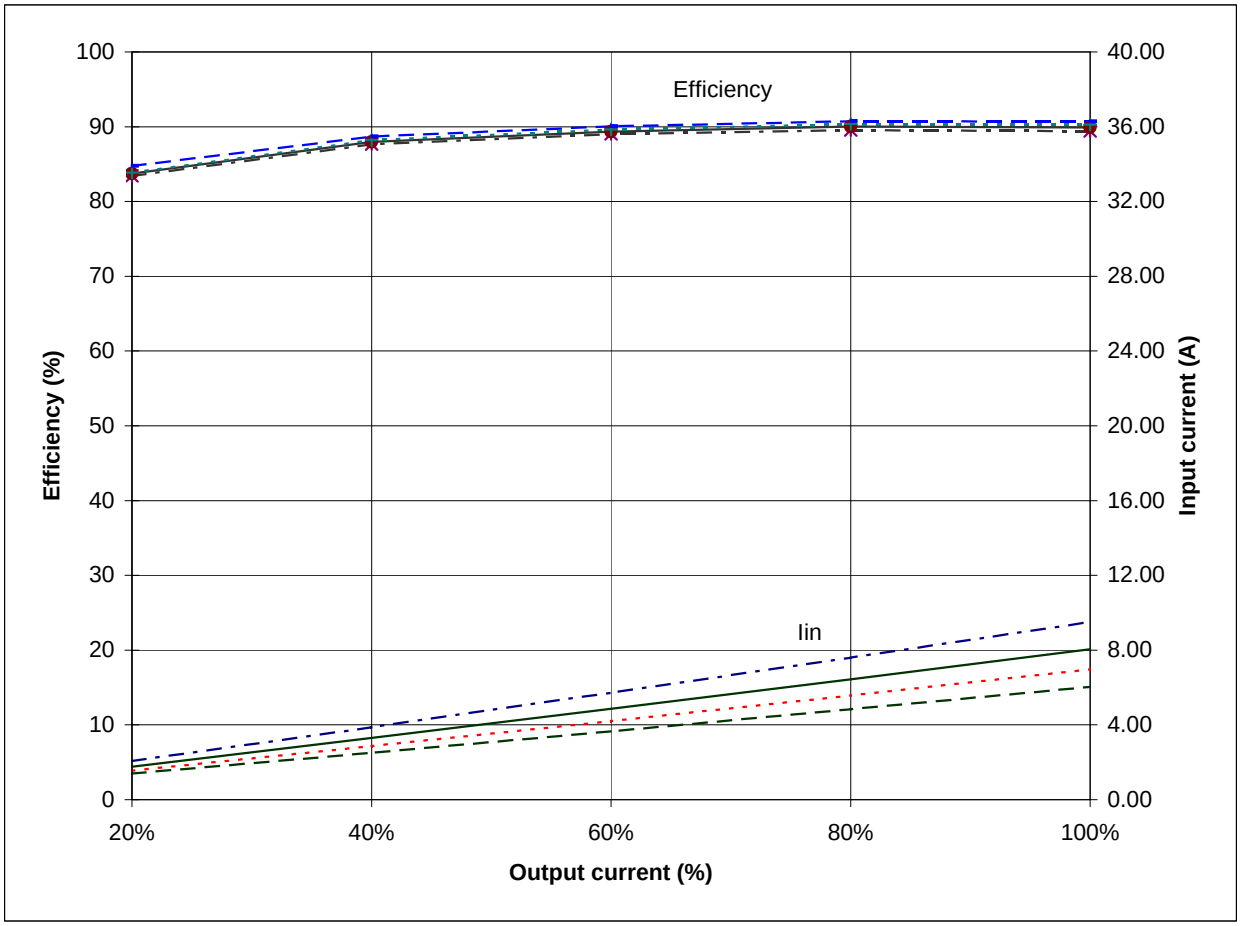


(3). Efficiency and Input current vs. Output current

Conditions:

Vin: 170 VAC
200 VAC
230 VAC
265 VAC
Vout:100%
Ta: 25˚C

GEN150-16 3Φ 200

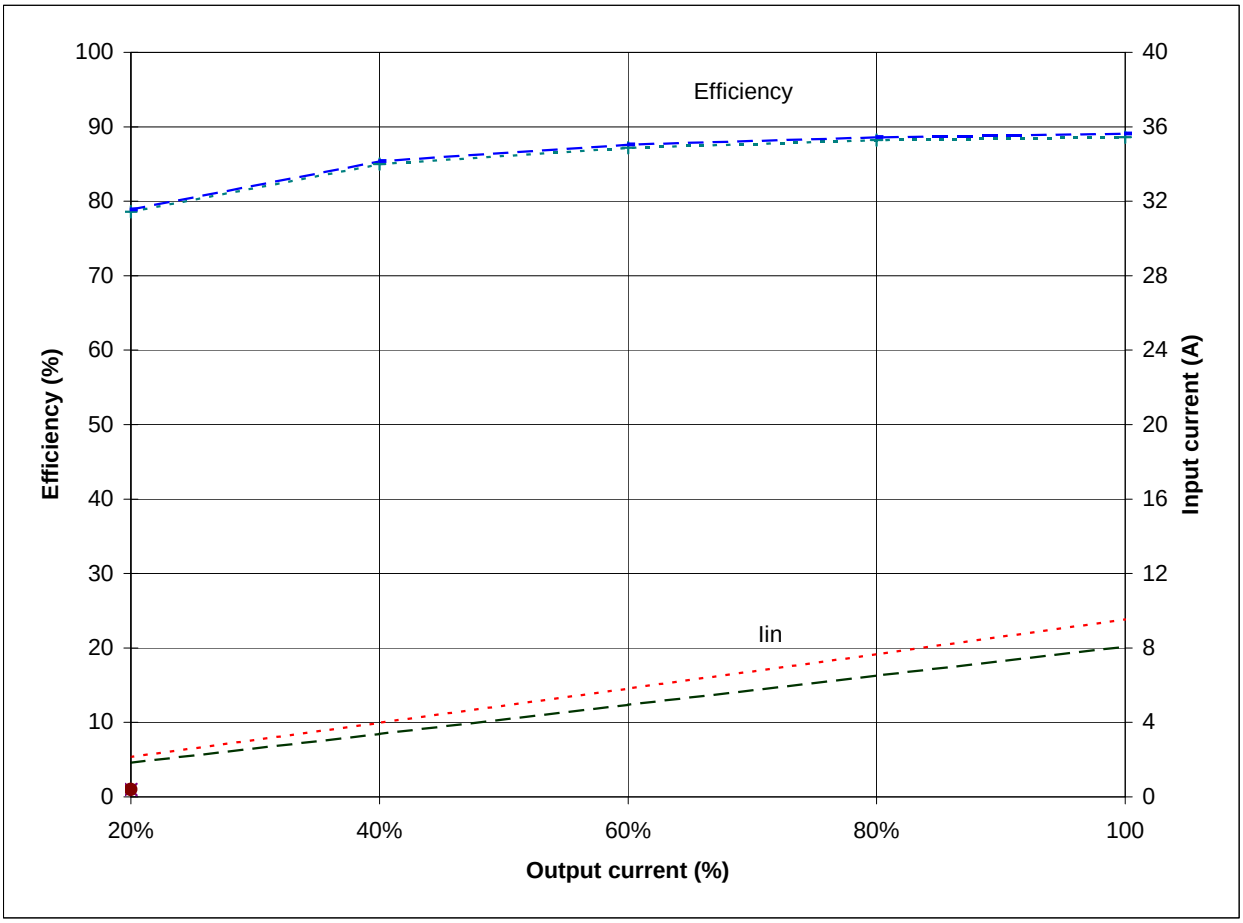


(3). Efficiency and Input current vs. Output current

Conditions:

Vin: 170 VAC
200 VAC
230 VAC
265 VAC
Vout:100%
Ta: 25˚C

GEN600-4 3Φ 200

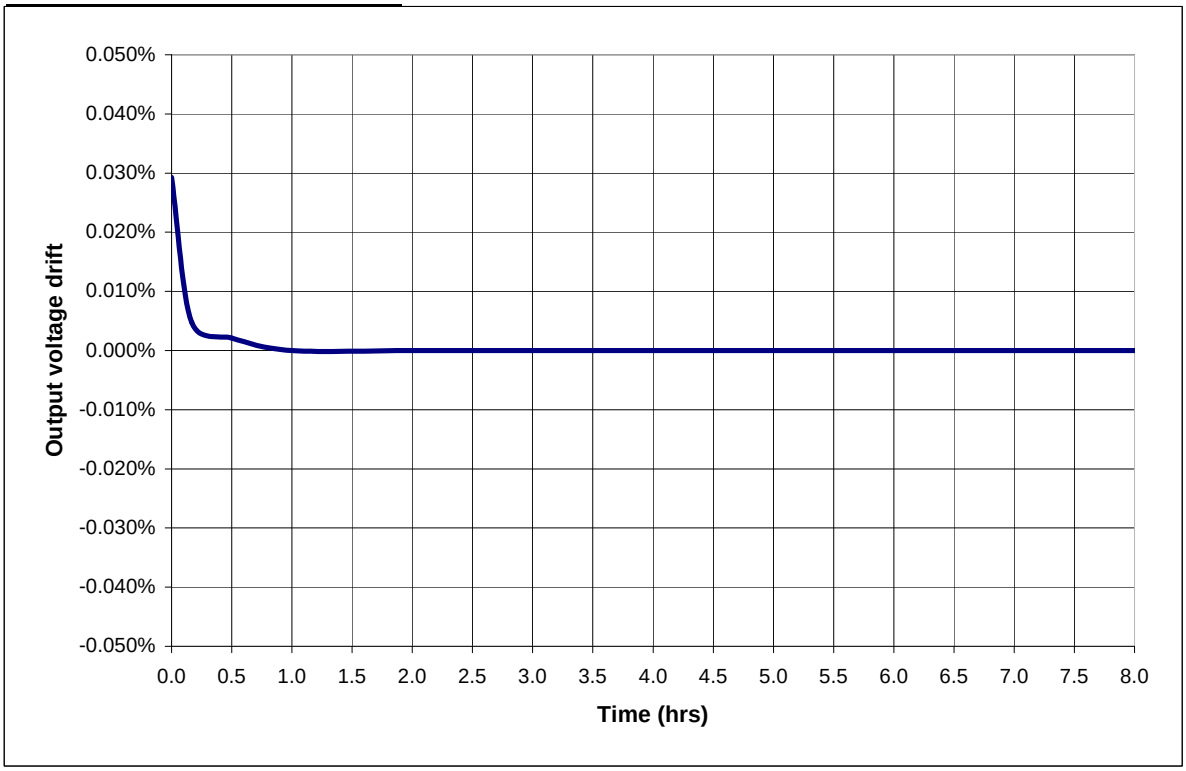


2.2 Warm up drift & stability

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

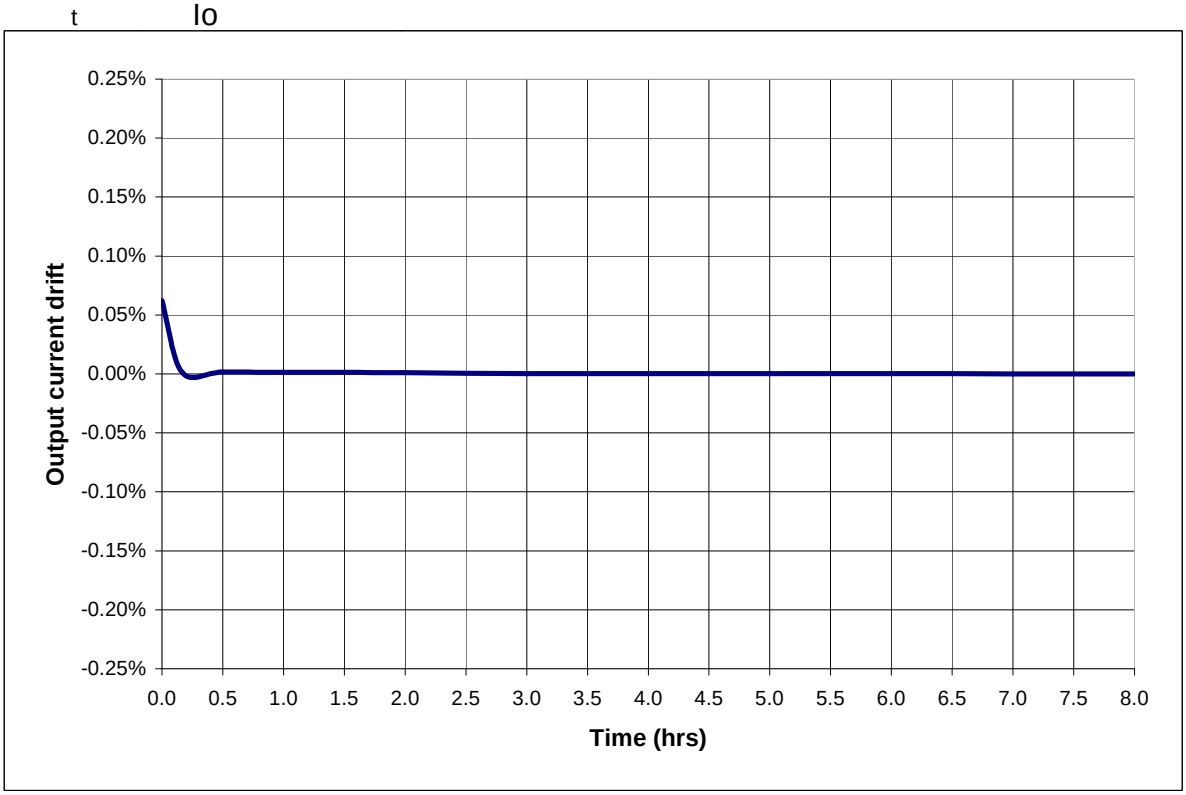
GEN8-300 C.V mode

t Vo



GEN8-300 C.C mode

t Io

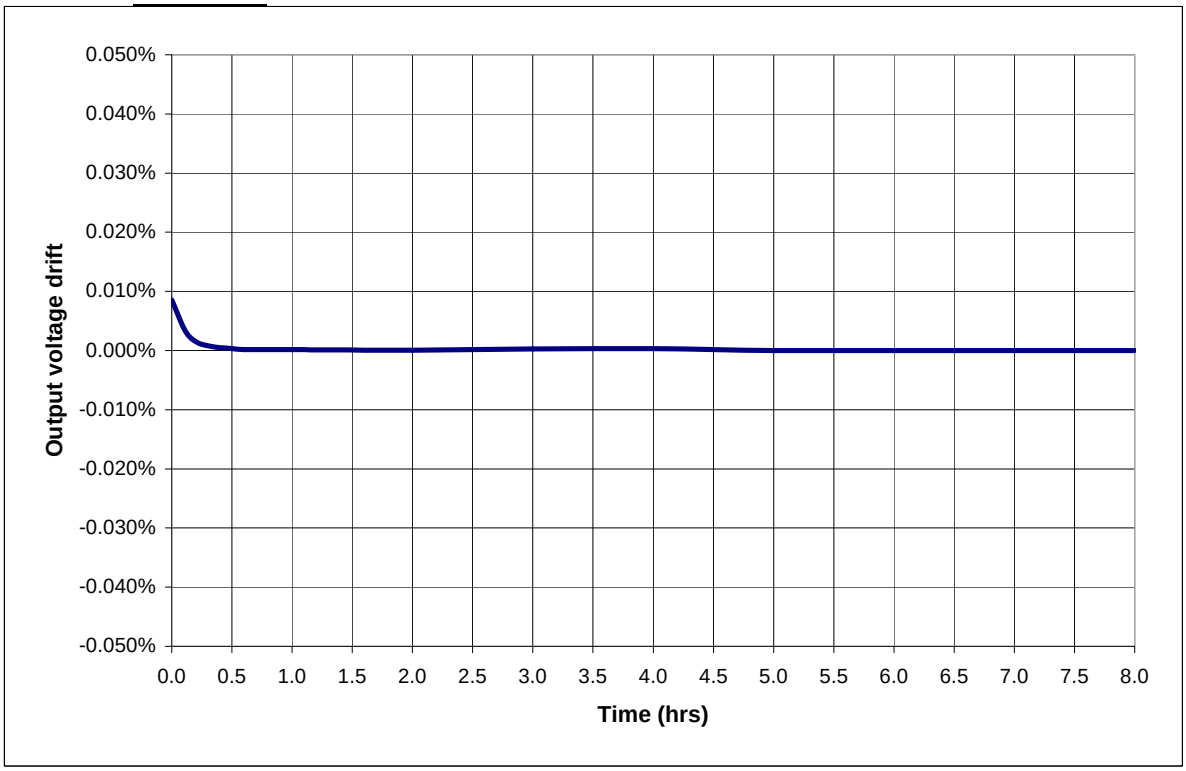


2.2 Warm up drift & stability

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

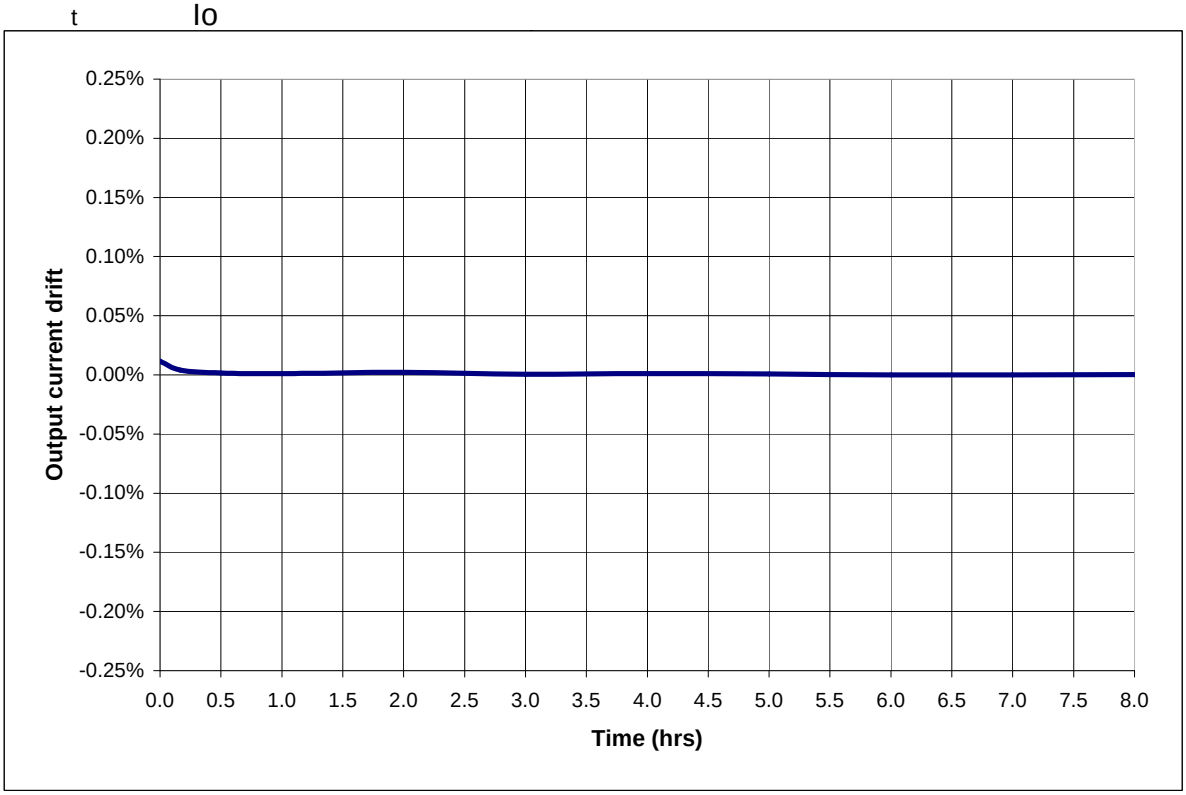
GEN60-40 C.V mode

t Vo



GEN60-40 C.C mode

t Io

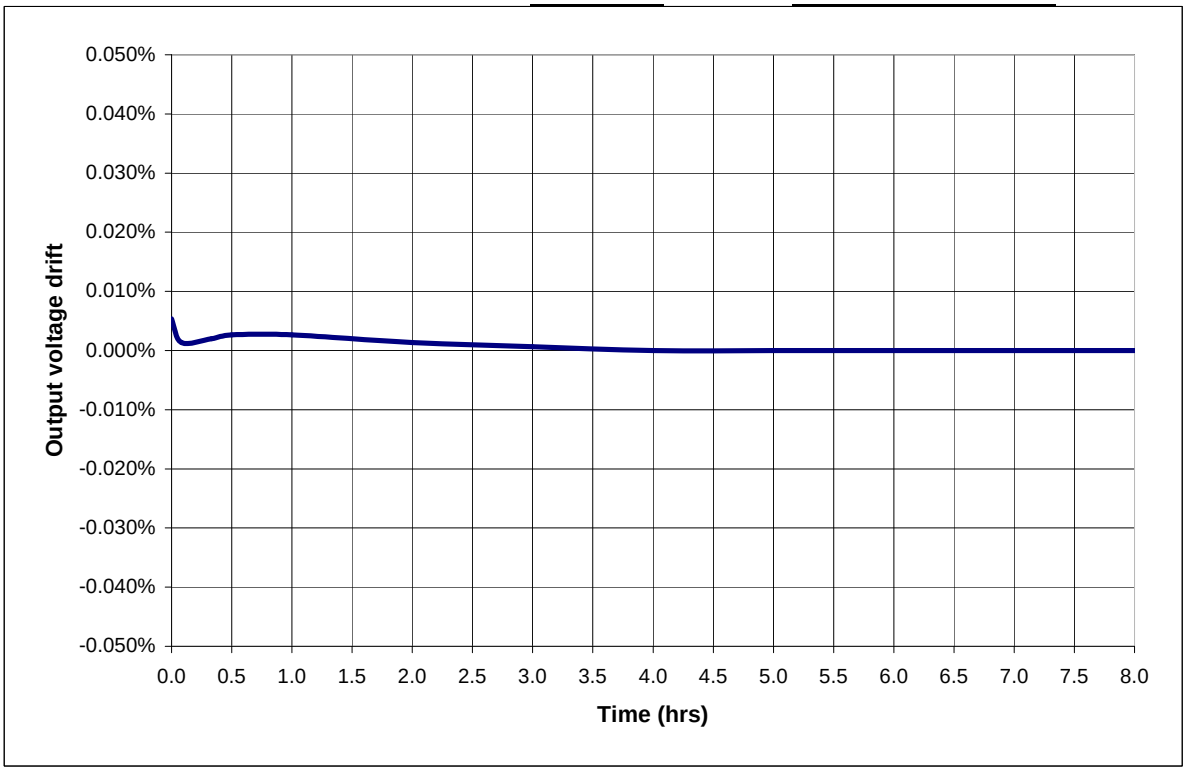


2.2 Warm up drift & stability

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

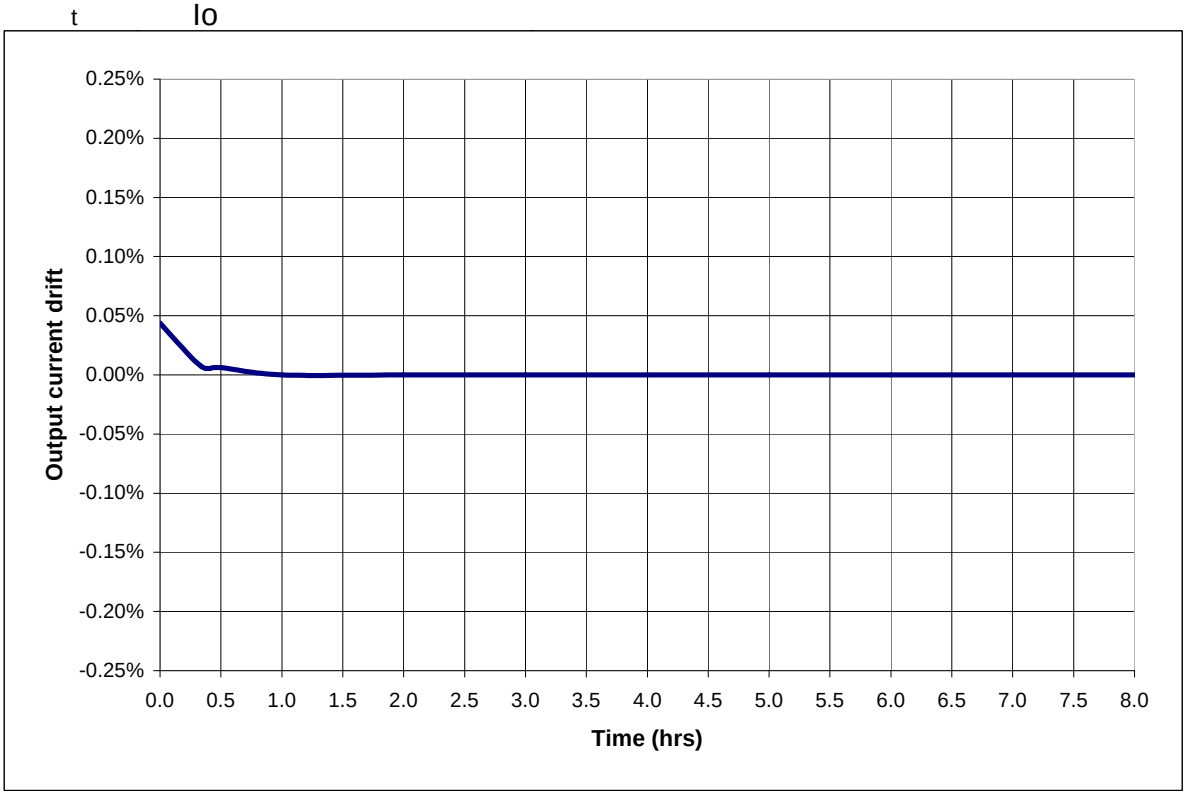
GEN150-16 C.V mode

t Vo



GEN150-16 C.C mode

t Io

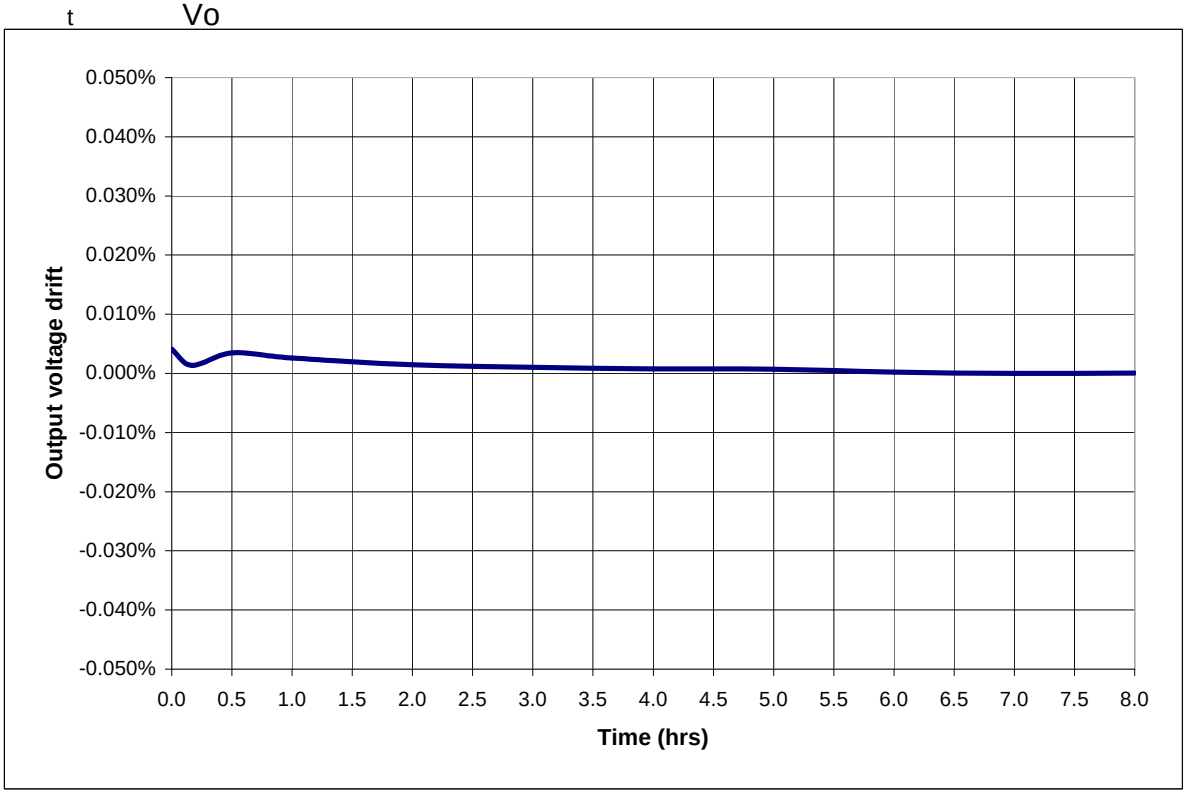


2.2 Warm up drift & stability

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

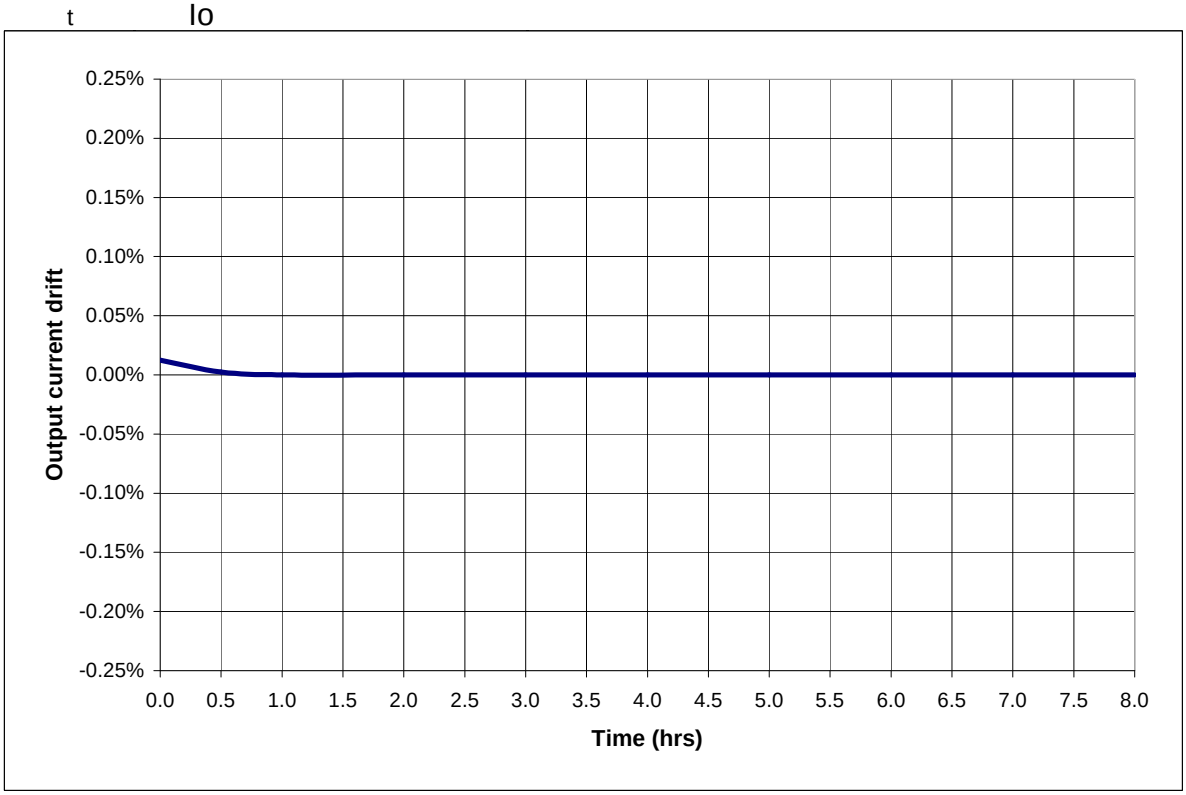
GEN600-4 C.V mode

t Vo



GEN600-4 C.C mode

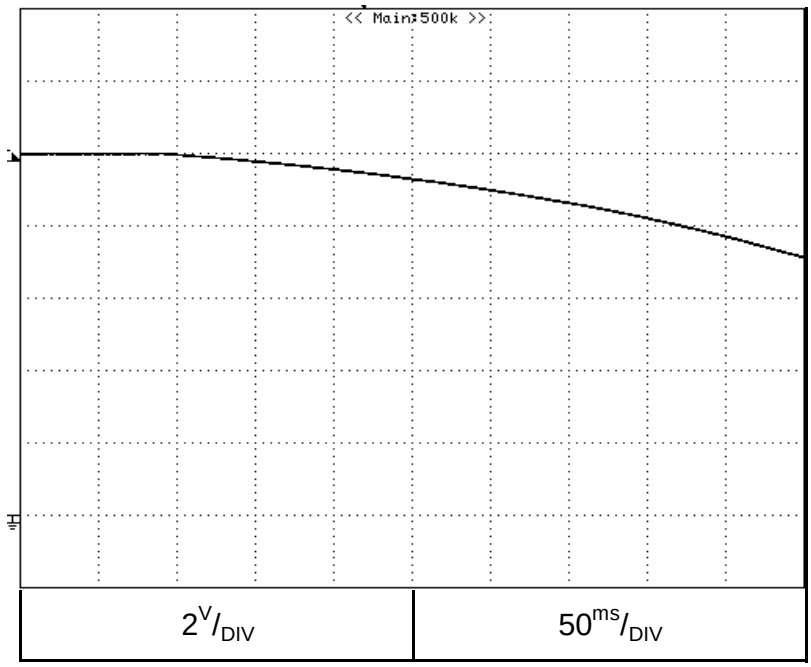
t Io



2.3 Over voltage protection (OVP) characteristic

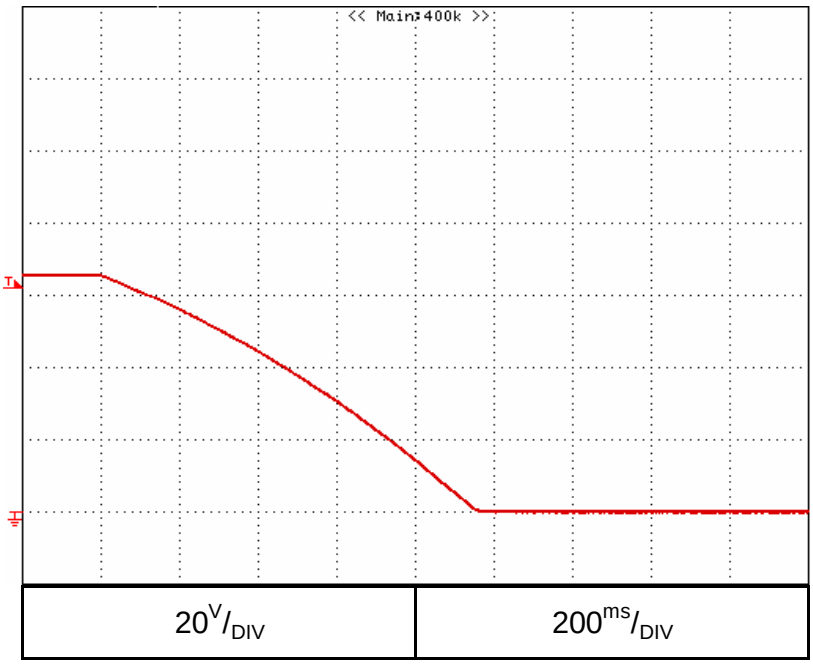
Conditions: Vset: 100%
Iout: 0%
Ta = 25℃

GEN8-300



OVP setting:10V

GEN60-40

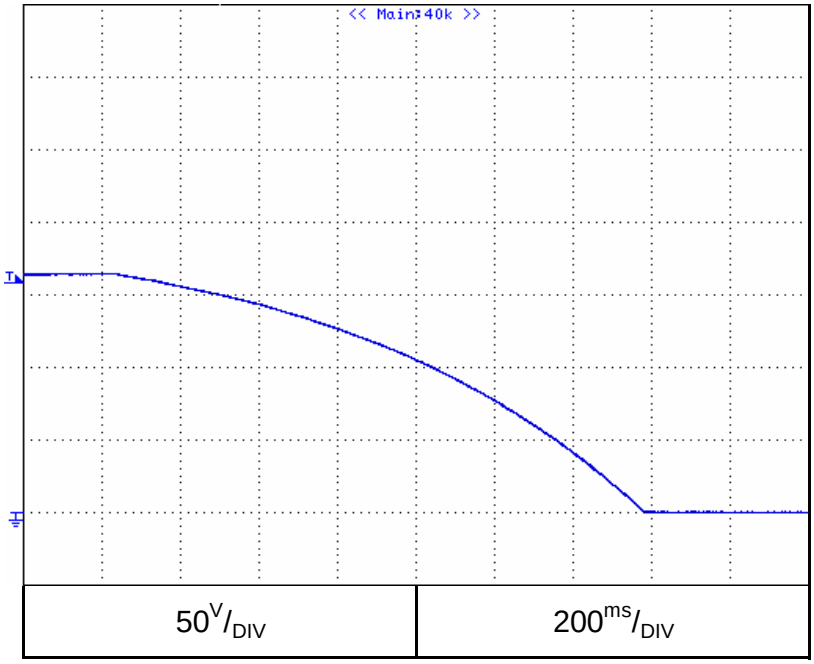


OVP setting:66.15V

2.3 Over voltage protection (OVP) characteristic

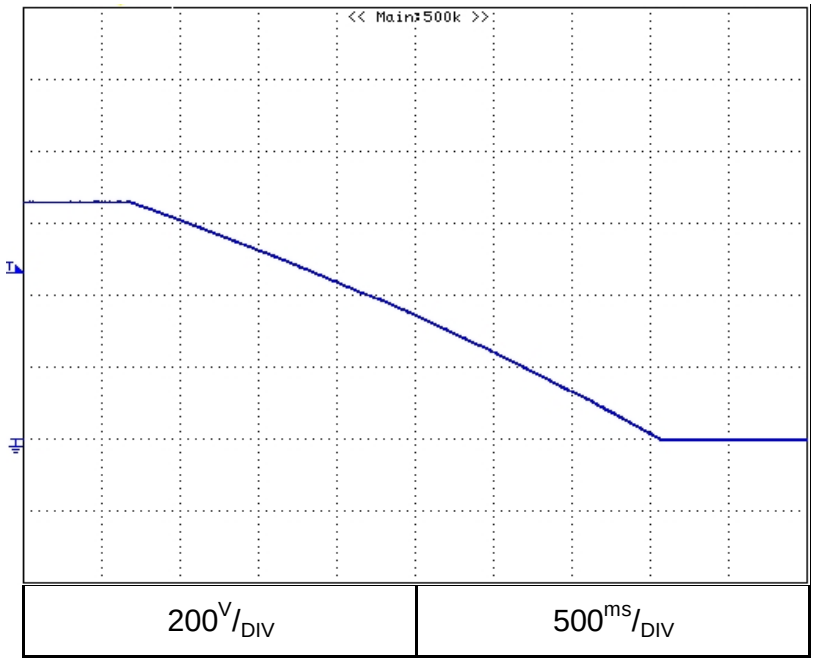
Conditions: Vset: 100%
Iout: 0%
Ta = 25℃

GEN150-16



OVP setting:165V

GEN600-4

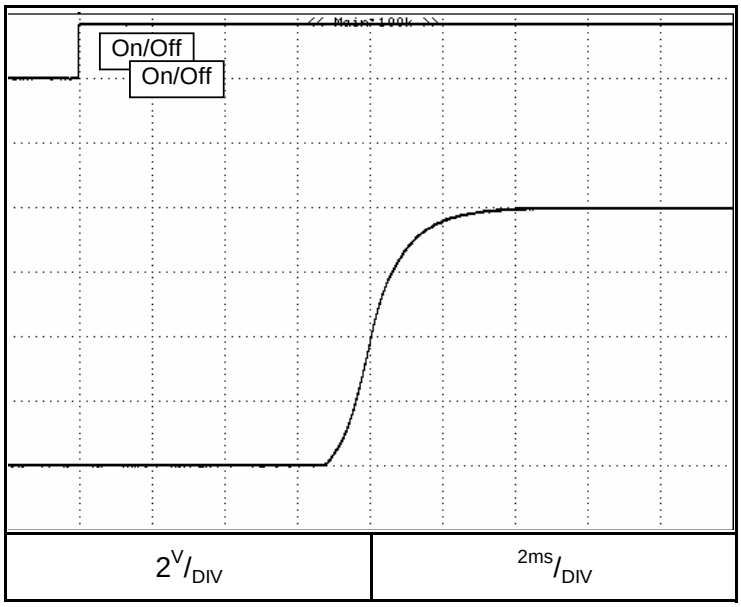


OVP setting:662V

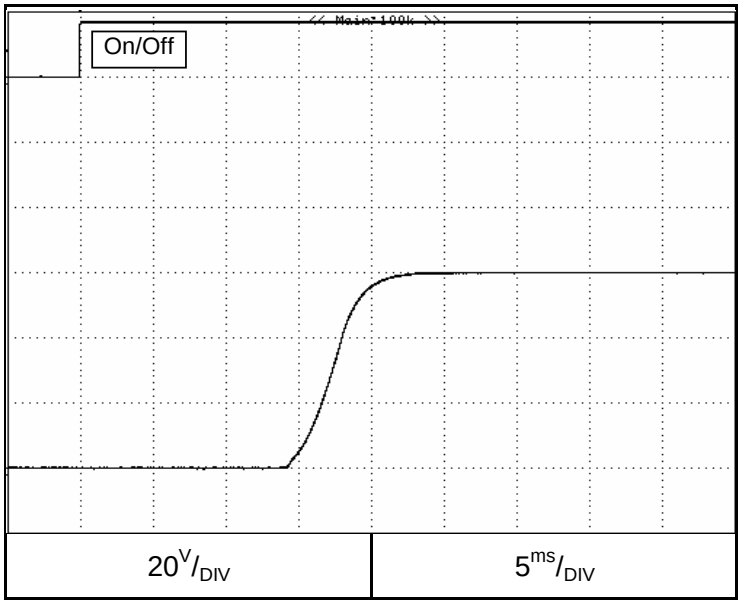
2.4 ON/OFF Output rise characteristics
C.V mode

Conditions: Vin:Nominal
Vout: 100%
Iout: 0%
Iset=105%
Ta = 25°C

GEN8-300



GEN60-40

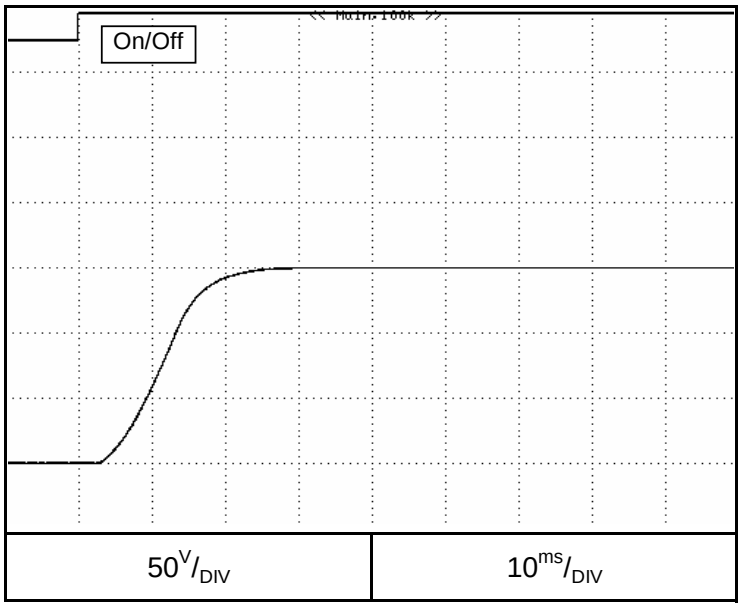


2.4 ON/OFF Output rise characteristics

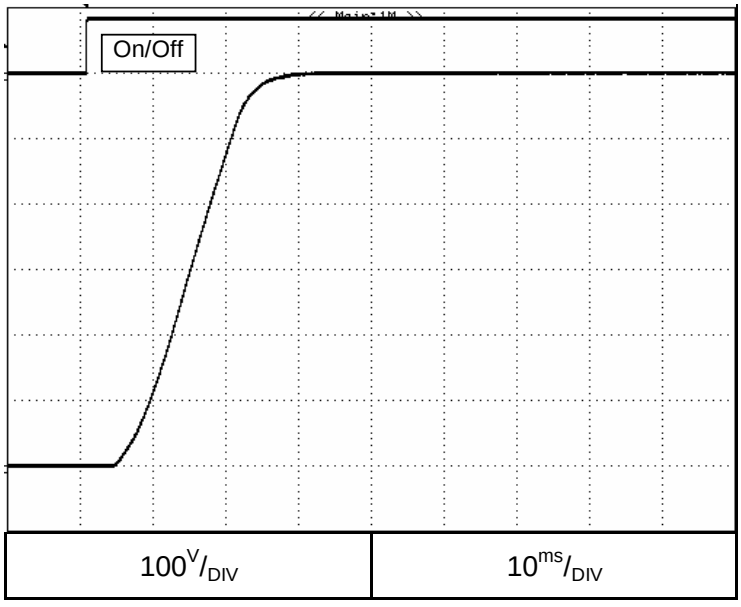
C.V mode

Conditions: Vin:Nominal
Vout: 100%
Iout: 0%
Iset=105%
Ta = 25°C

GEN150-16



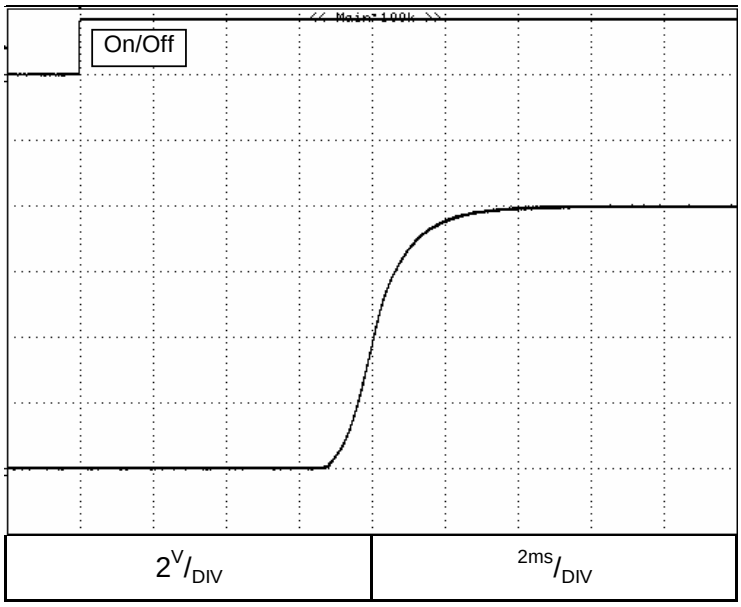
GEN600-4



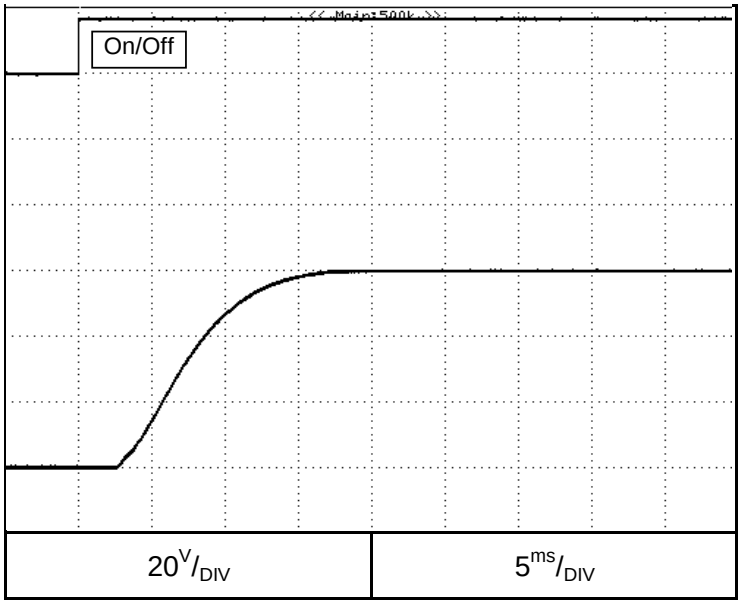
2.4 ON/OFF Output rise characteristics
C.V mode

Conditions: Vin:Nominal
Vout: 100%
Iout: 100%
Iset=105%
Load: CR
Ta = 25°C

GEN8-300



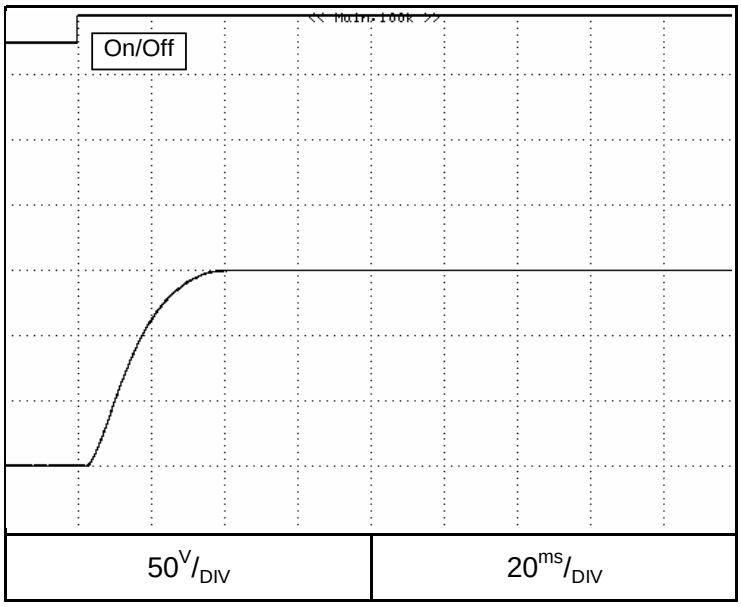
GEN60-40



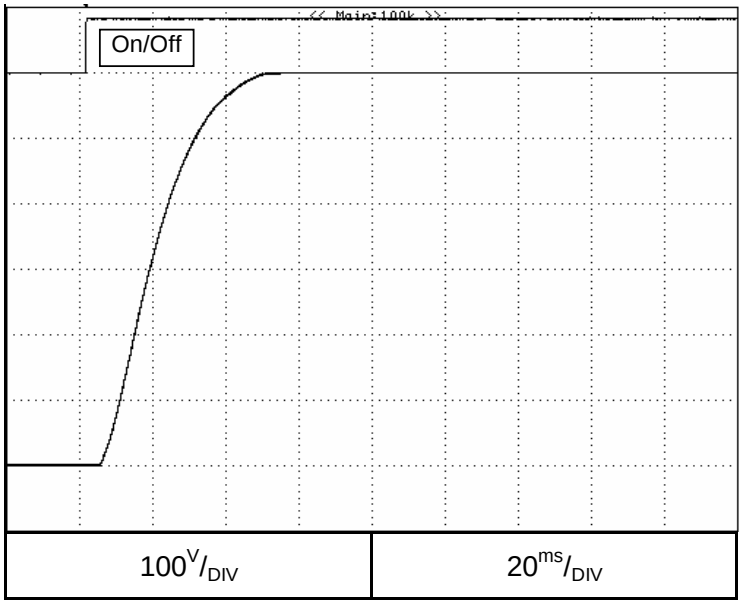
2.4 ON/OFF Output rise characteristics
C.V mode

Conditions: Vin:Nominal
Vout: 100%
Iout: 100%
Iset=105%
Load: CR
Ta = 25°C

GEN150-16



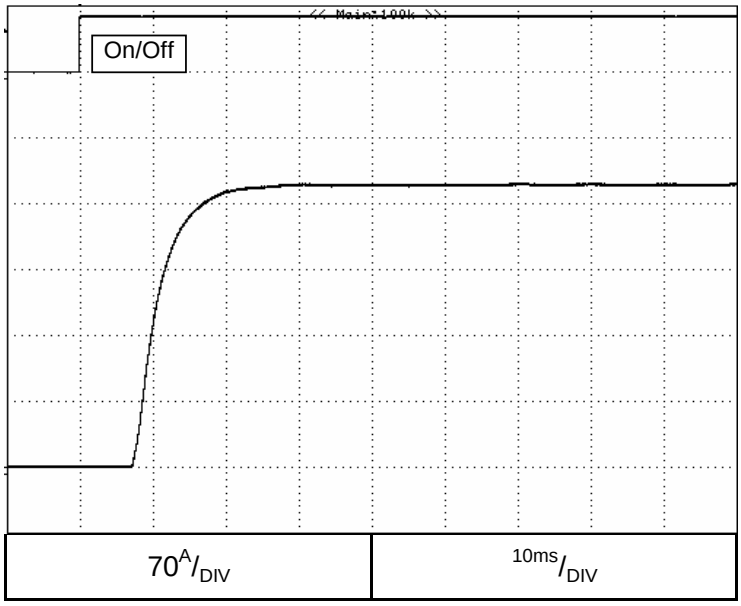
GEN600-4



2.4 ON/OFF Output rise characteristics
C.C mode

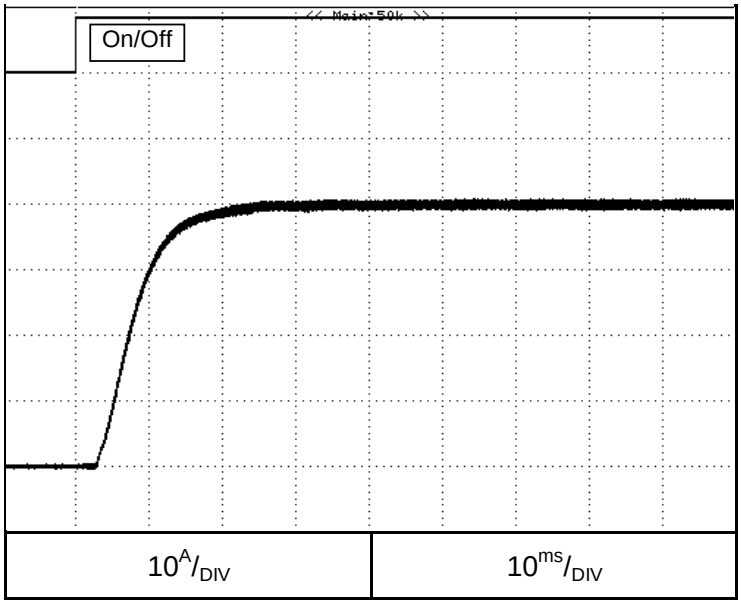
Conditions: Vin:Nominal
Vout: 100%
Iout: 100%
Vset=105%
Load: CR
Ta = 25°C

GEN8-300



$70^{A}/_{DIV}$	$^{10ms}/_{DIV}$

GEN60-40

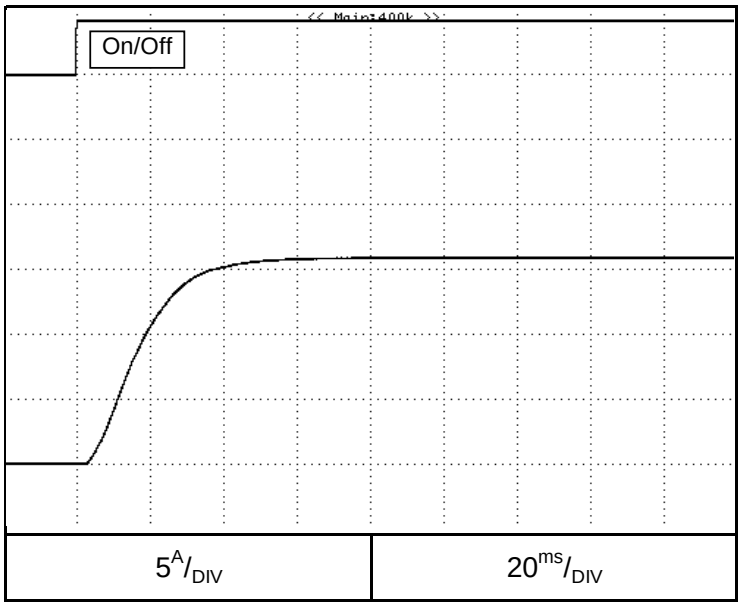


$10^{A}/_{DIV}$	$10^{ms}/_{DIV}$

2.4 ON/OFF Output rise characteristics
C.C mode

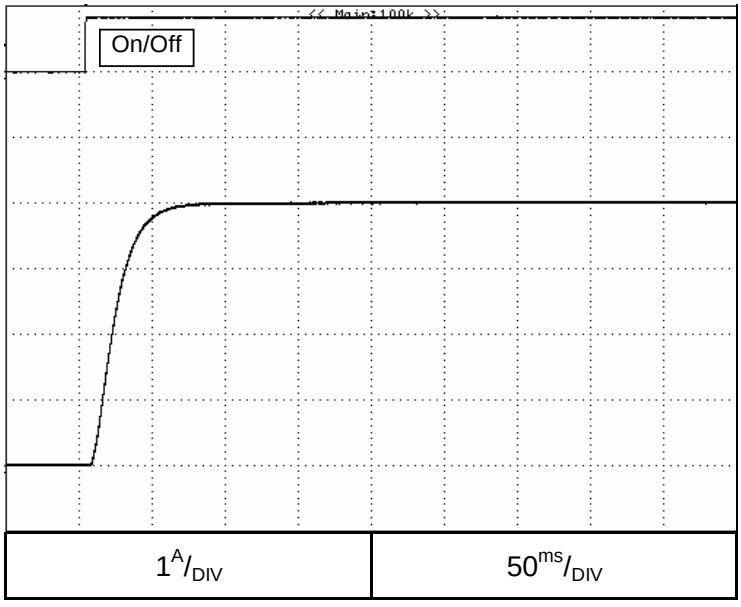
Conditions: Vin:Nominal
Vout: 100%
Iout: 100%
Vset=105%
Load: CR
Ta = 25°C

GEN150-16



$5^{A}/_{DIV}$	$20^{ms}/_{DIV}$

GEN600-4

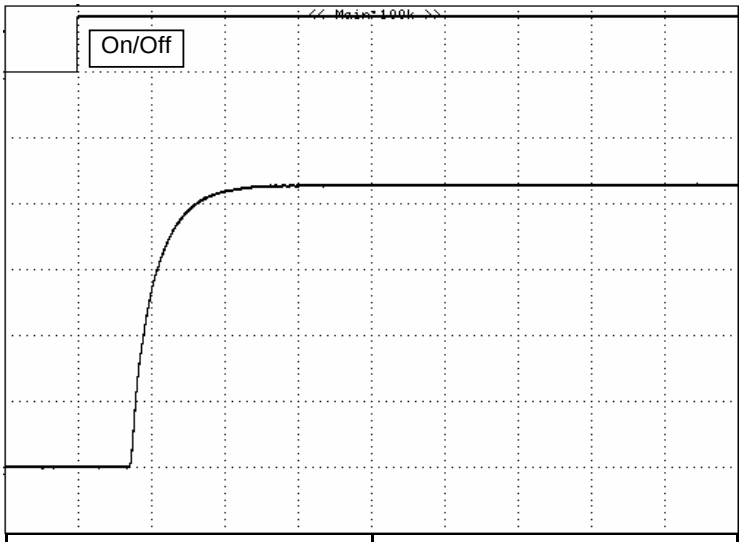


$1^{A}/_{DIV}$	$50^{ms}/_{DIV}$

2.4 ON/OFF Output rise characteristics
C.C mode

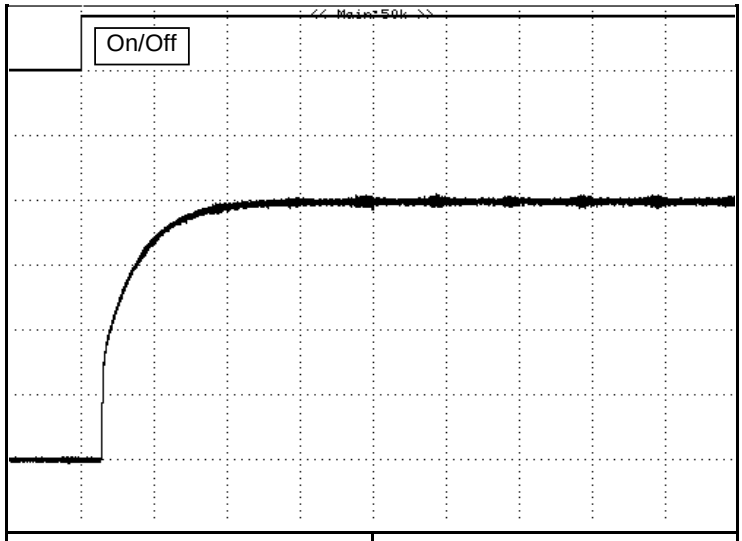
Conditions: Vin:Nominal
Iout: 100%
Vset=105%
shorted output
Ta = 25°C

GEN8-300



$70^{A}/_{DIV}$	$^{10ms}/_{DIV}$

GEN60-40

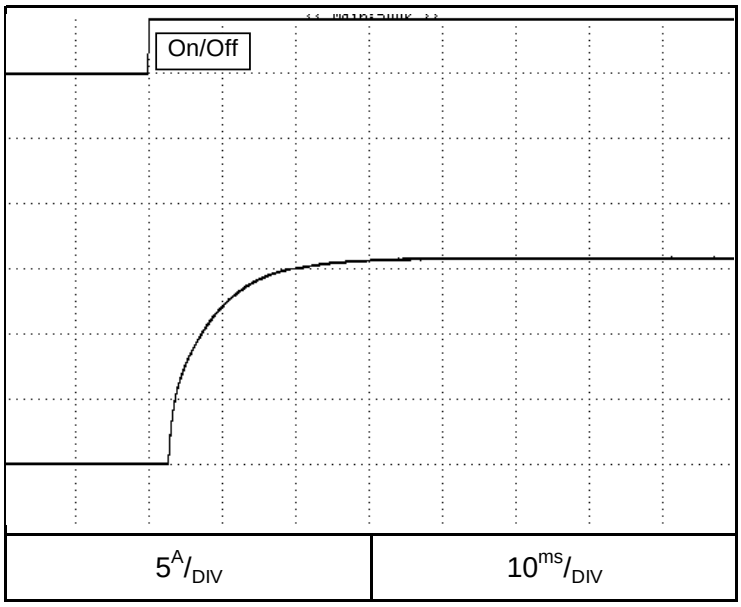


$10^{A}/_{DIV}$	$10^{ms}/_{DIV}$

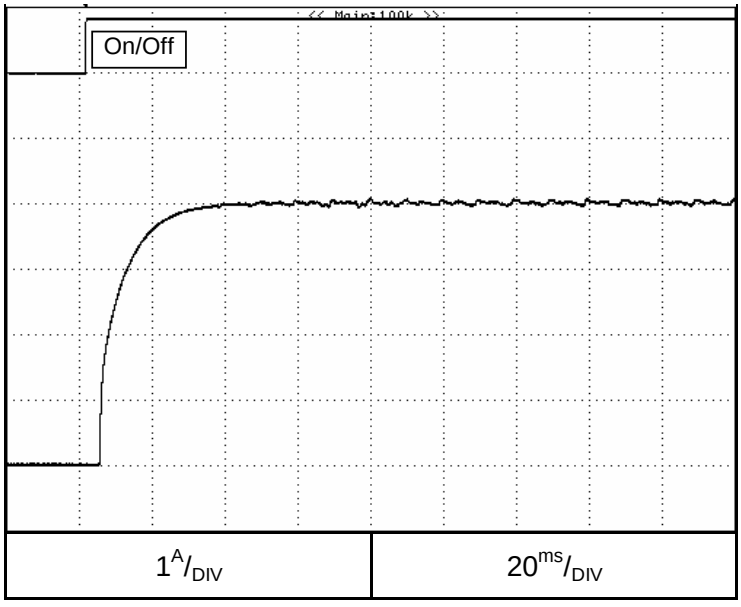
2.4 ON/OFF Output rise characteristics
C.C mode

Conditions: Vin:Nominal
Iout: 100%
Vset=105%
shorted output
Ta = 25°C

GEN150-16



GEN600-4

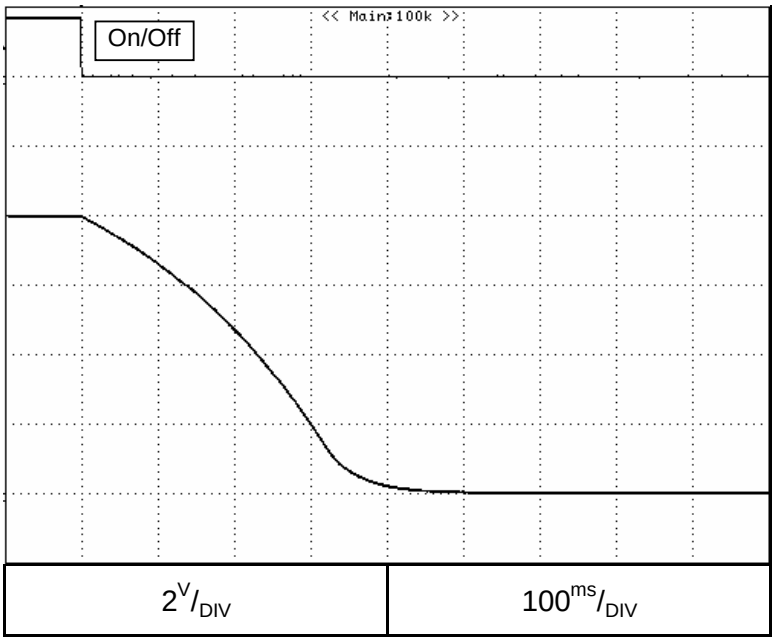


2.5 ON/OFF Output fall characteristics

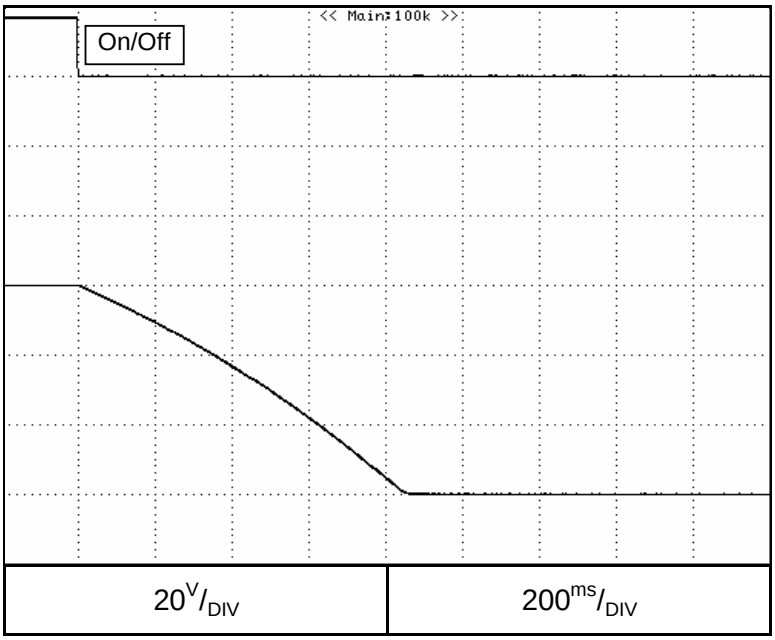
C.V mode

Conditions: Vin:Nominal
Vout: 100%
Iout: 0%
Ta = 25℃

GEN8-300



GEN60-40

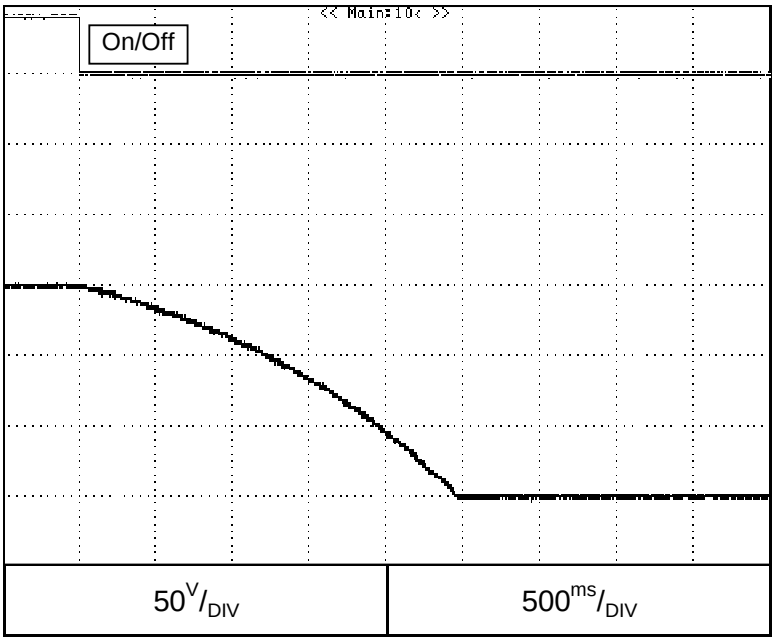


2.5 ON/OFF Output fall characteristics

C.V mode

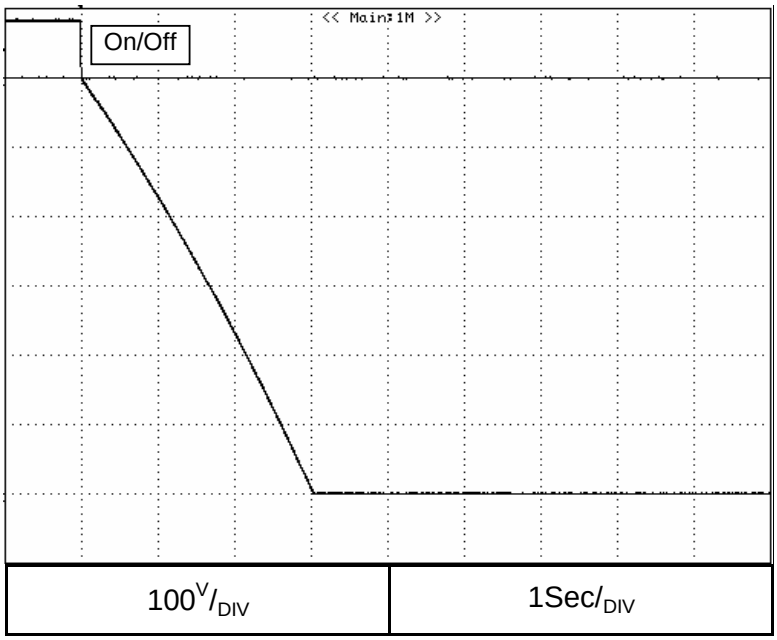
Conditions: Vin:Nominal
Vout: 100%
Iout: 0%
Ta = 25℃

GEN150-16



$50^{V}/_{DIV}$	$500^{ms}/_{DIV}$

GEN600-4



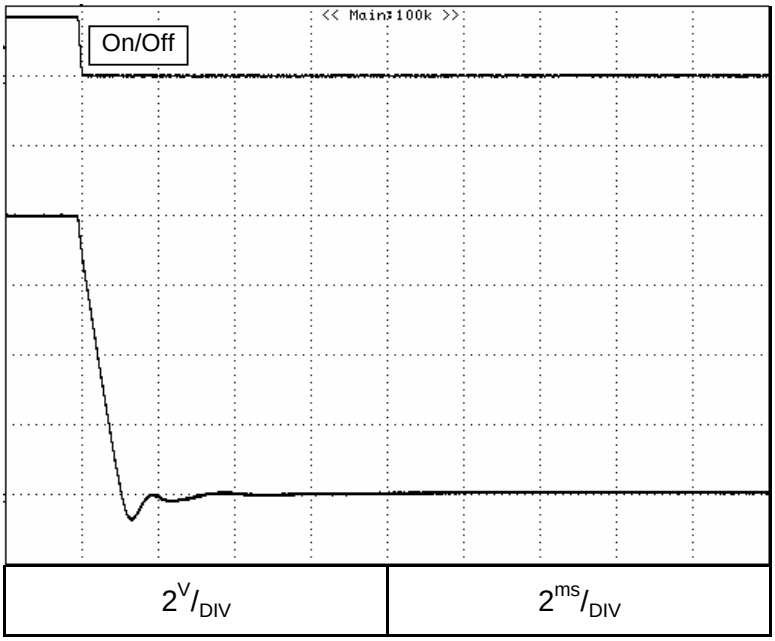
$100^{V}/_{DIV}$	$1Sec/_{DIV}$

2.5 ON/OFF Output fall characteristics

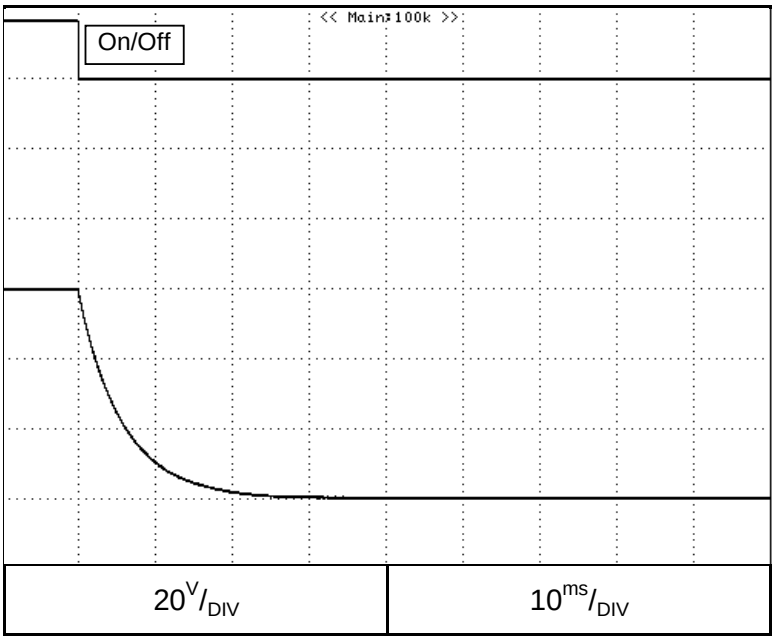
C.V mode

Conditions: Vin:Nominal
Vout: 100%
Iout: 100%
Load: CR
Ta = 25℃

GEN8-300



GEN60-40

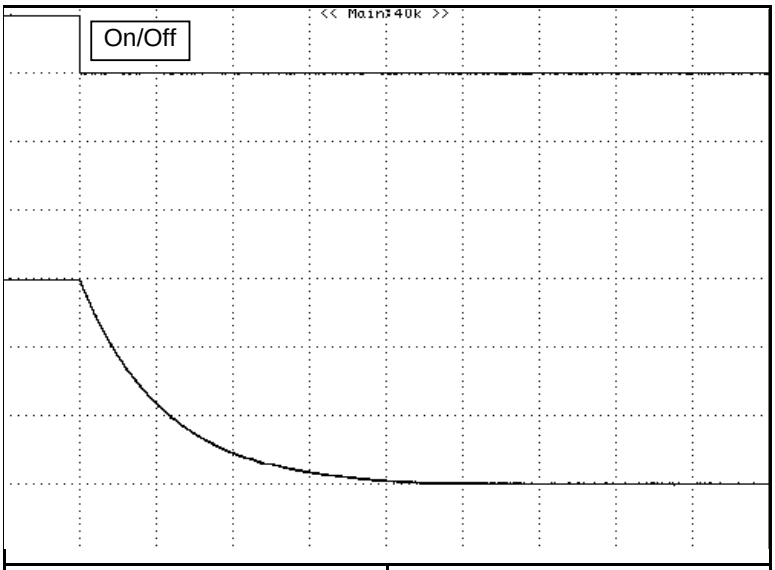


2.5 ON/OFF Output fall characteristics

C.V mode

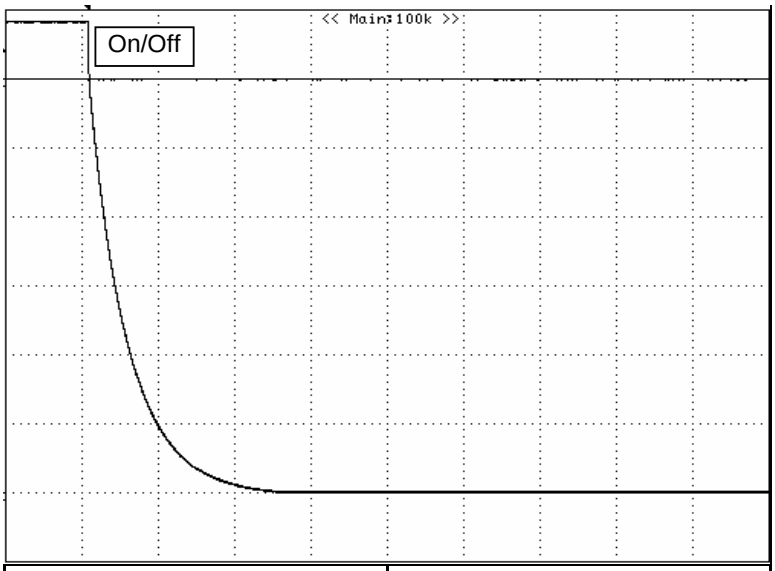
Conditions: Vin:Nominal
Vout: 100%
Iout: 100%
Load: CR
Ta = 25℃

GEN150-16



$50^{V}/_{DIV}$	$20^{ms}/_{DIV}$

GEN600-4



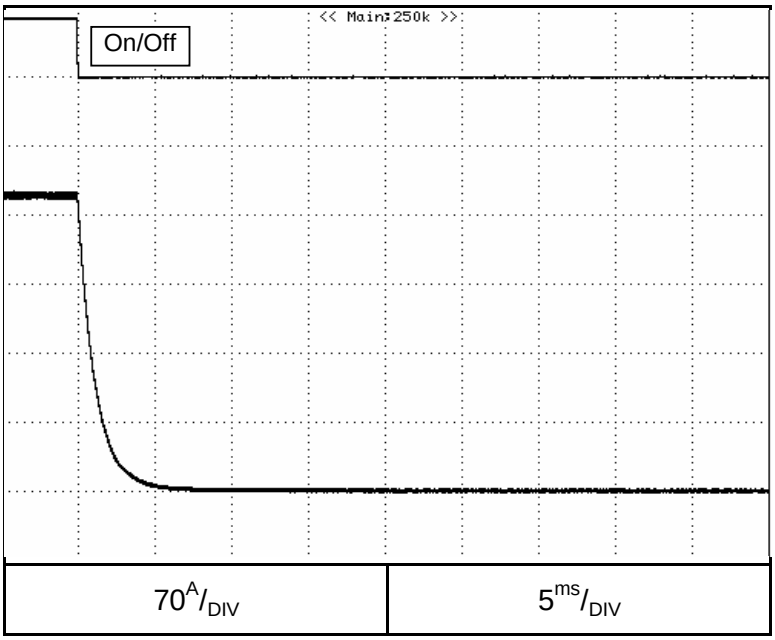
$100^{V}/_{DIV}$	$50^{ms}/_{DIV}$

2.5 ON/OFF Output fall characteristics

C.C mode

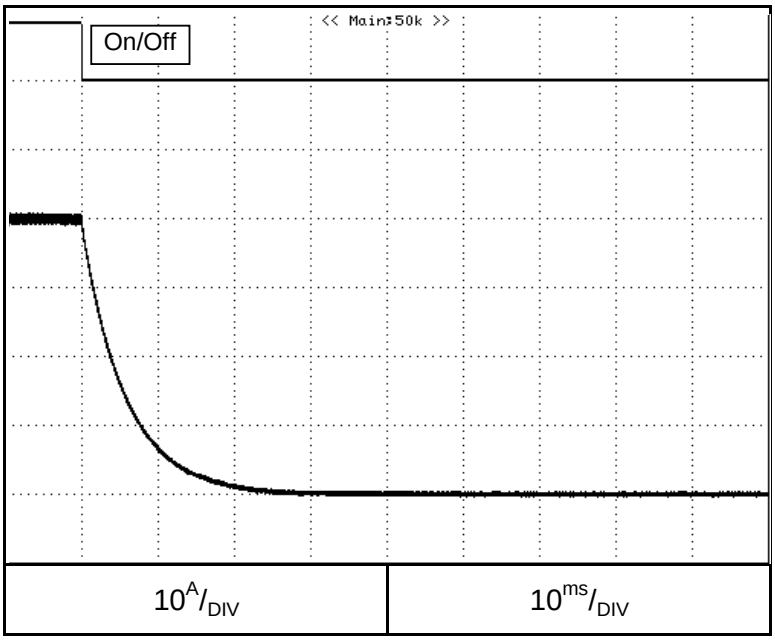
Conditions: Vin:Nominal
Vout: 100%
Iout: 100%
Load: CR
Ta = 25℃

GEN8-300



$70^{A}/_{DIV}$	$5^{ms}/_{DIV}$

GEN60-40

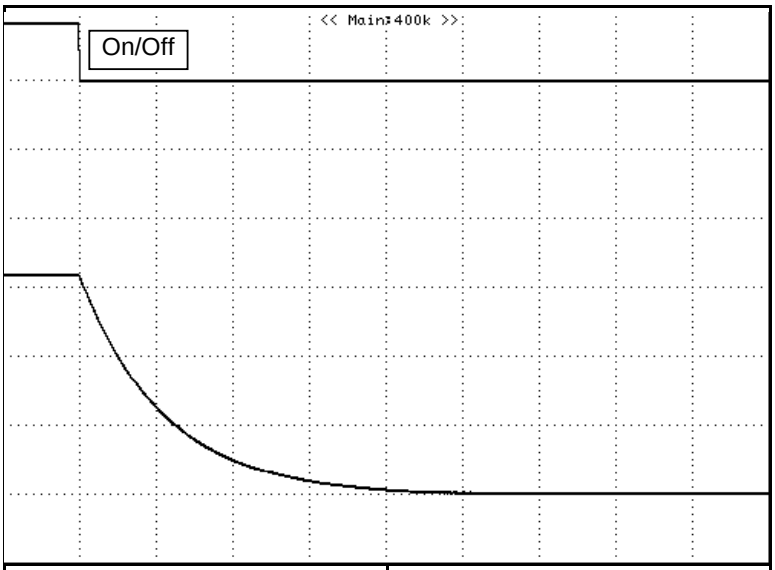


$10^{A}/_{DIV}$	$10^{ms}/_{DIV}$

2.5 ON/OFF Output fall characteristics
C.C mode

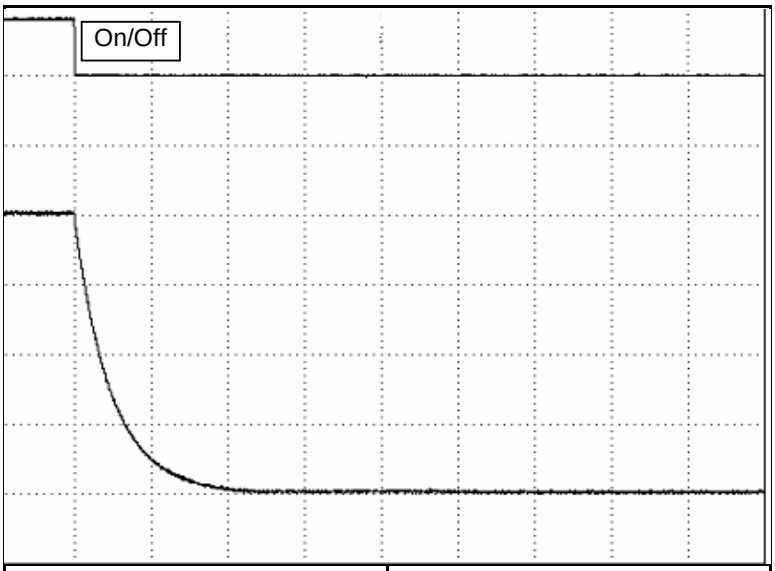
Conditions: Vin:Nominal
Vout: 100%
Iout: 100%
Load: CR
Ta = 25℃

GEN150-16



$5^{A}/_{DIV}$	$20^{ms}/_{DIV}$

GEN600-4



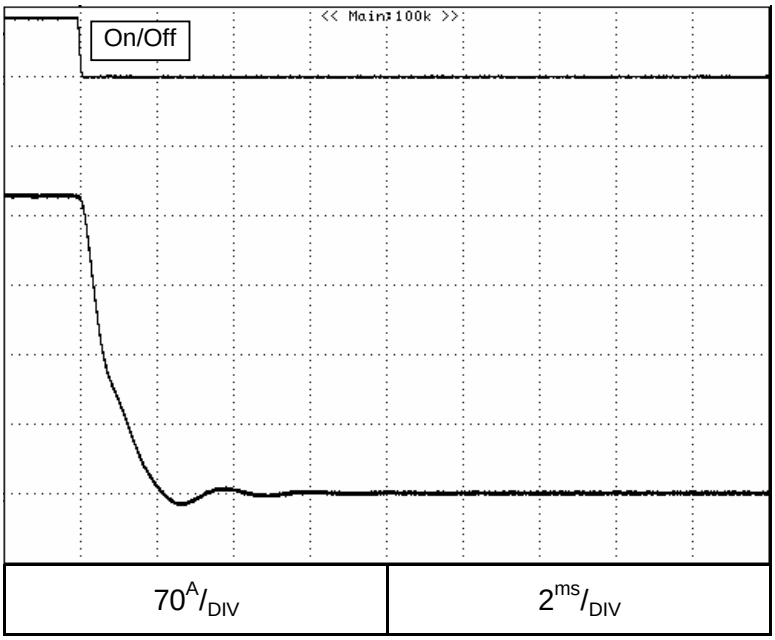
$1^{A}/_{DIV}$	$50^{ms}/_{DIV}$

2.5 ON/OFF Output fall characteristics

C.C mode

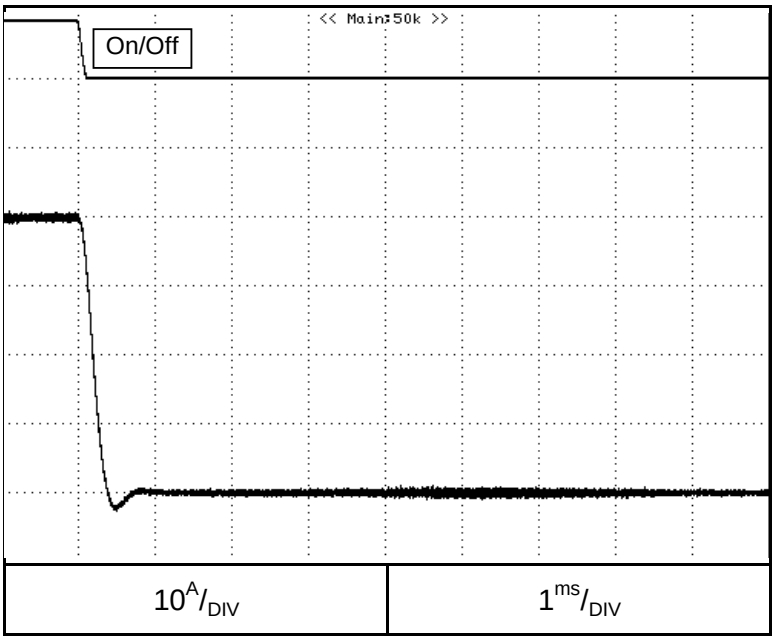
Conditions: Vin:Nominal
Iout: 100%
shorted output
Ta = 25℃

GEN8-300



$70^{A}/_{DIV}$	$2^{ms}/_{DIV}$

GEN60-40

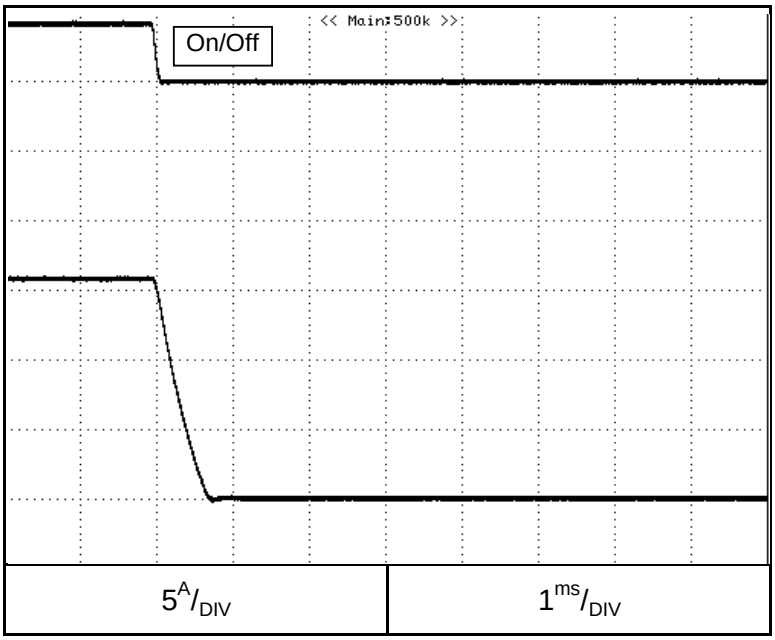


$10^{A}/_{DIV}$	$1^{ms}/_{DIV}$

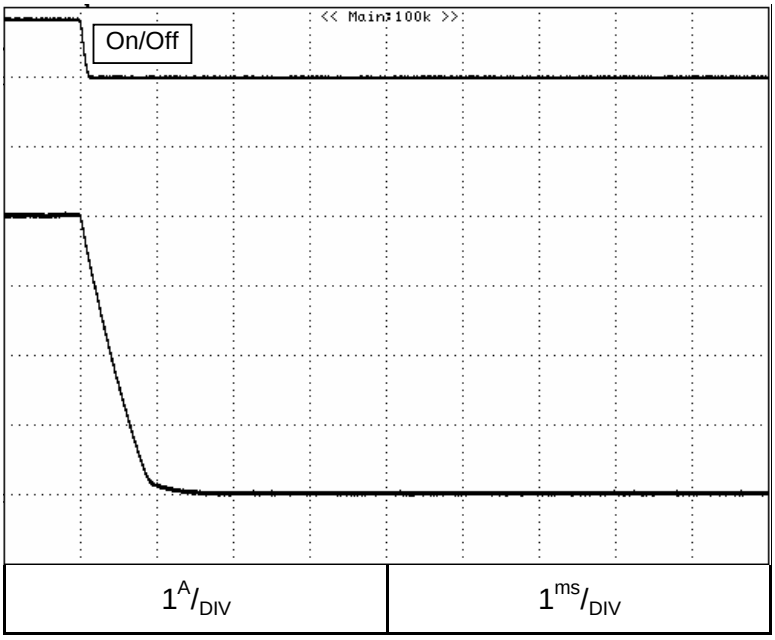
2.5 ON/OFF Output fall characteristics
C.C mode

Conditions: Vin:Nominal
Iout: 100%
shorted output
Ta = 25℃

GEN150-16



GEN600-4

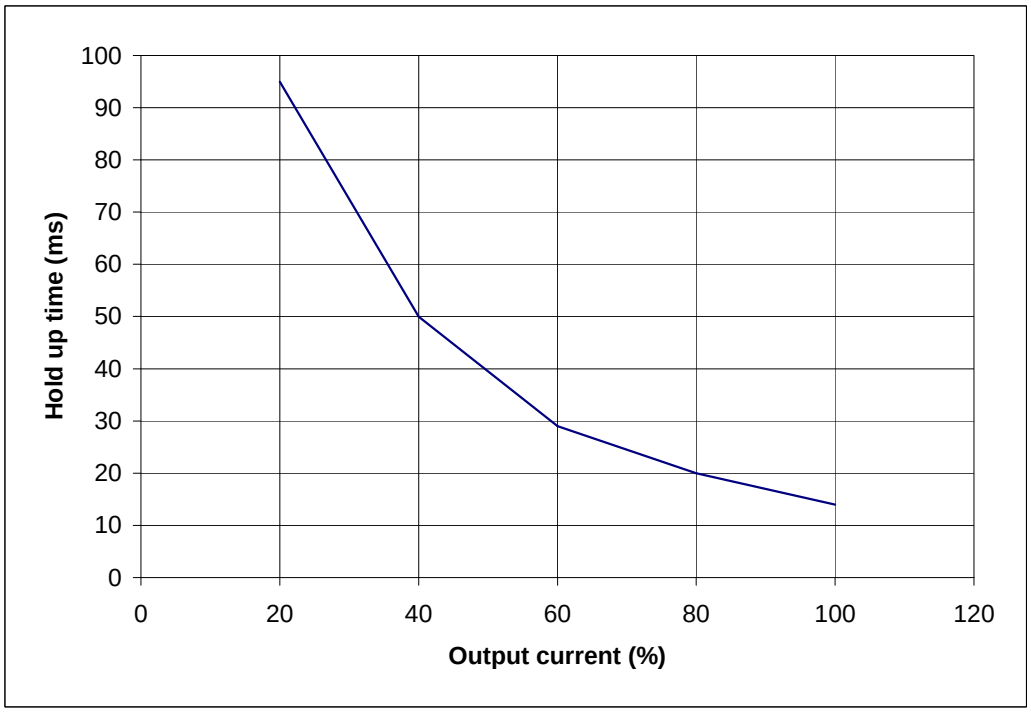


2.6 Hold up time characteristics

Conditions: Ta = 25°C
Vout:100%

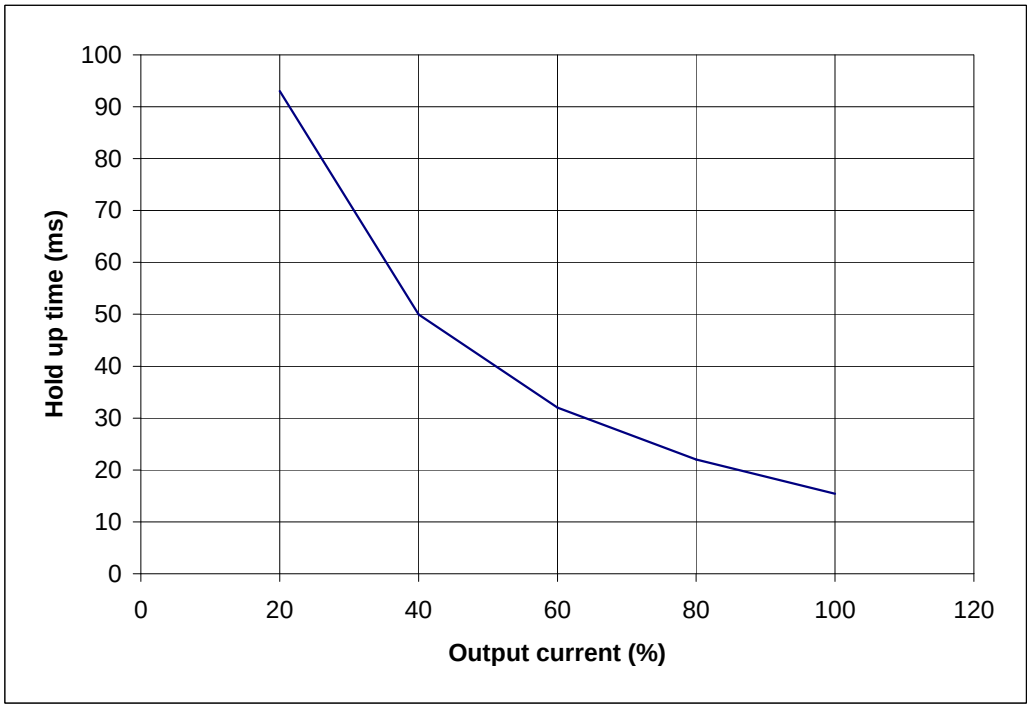
GEN8-300 1Φ 200

Vin:230VAC



GEN8-300 3Φ 200

Vin:230VAC

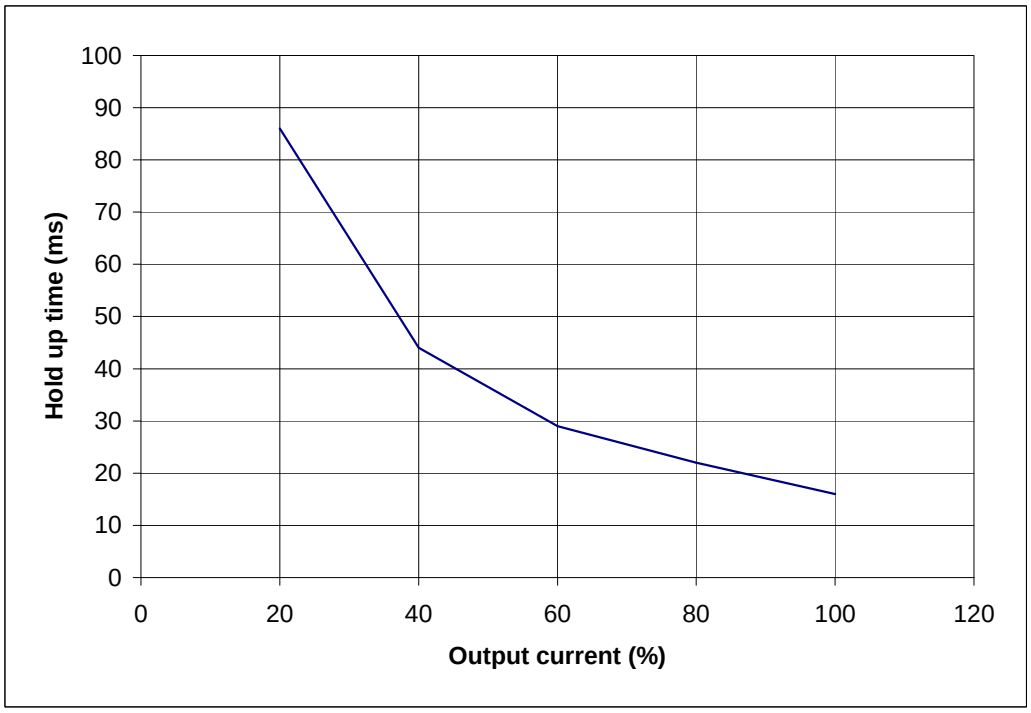


2.6 Hold up time characteristics

Conditions: Ta = 25°C
Vout:100%

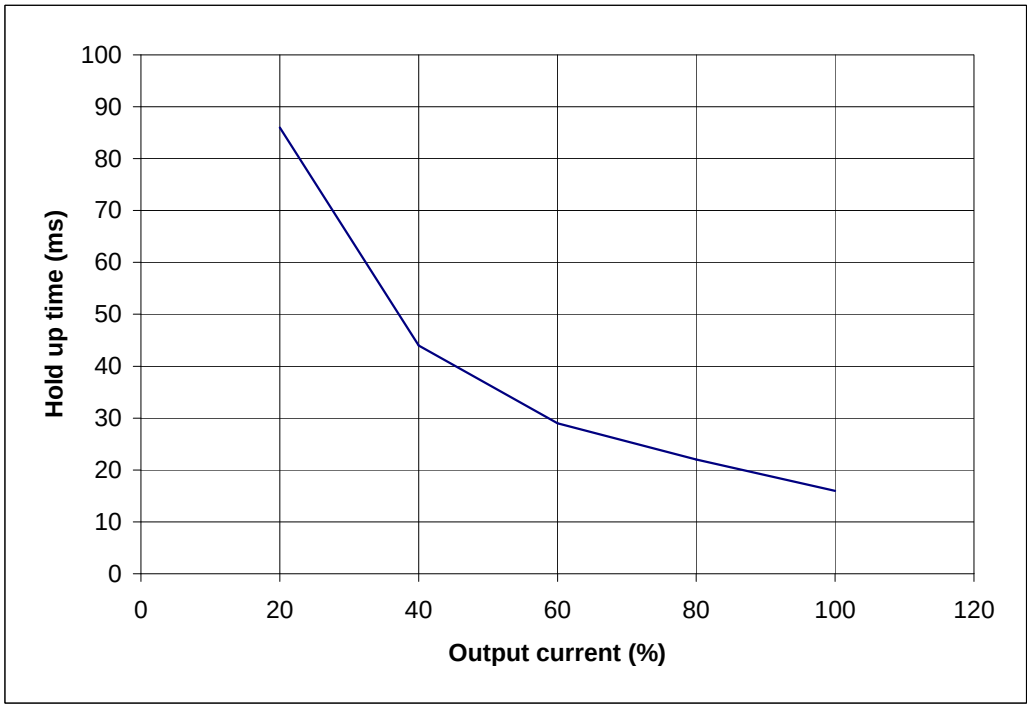
GEN60-40 1Φ 200

Vin:230VAC



GEN60-40 3Φ 200

Vin:230VAC

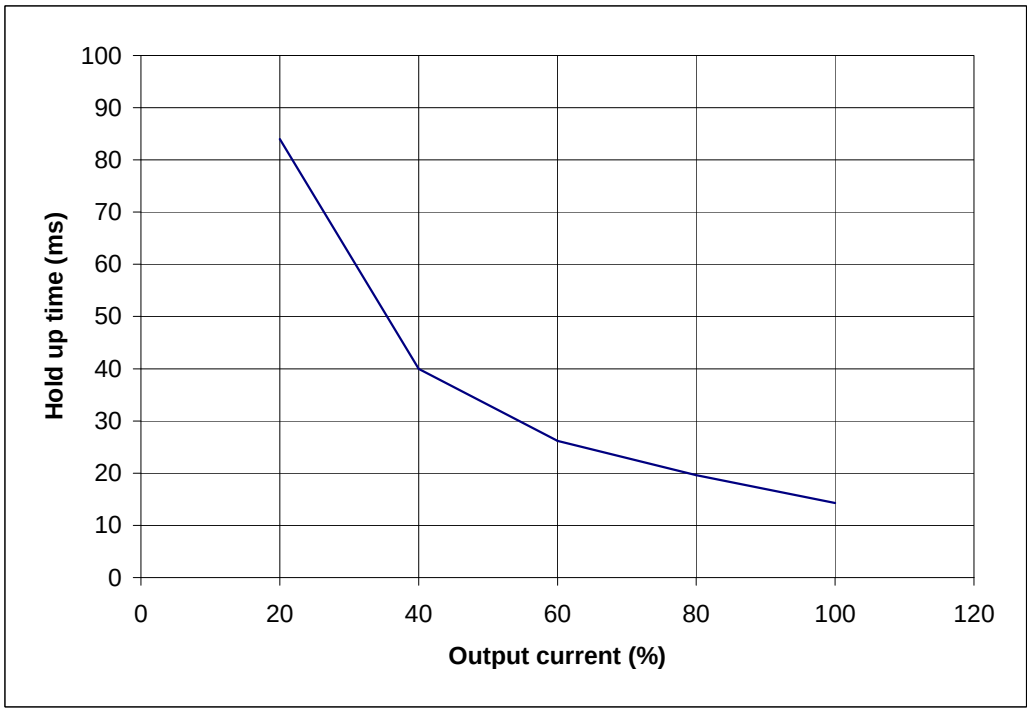


2.6 Hold up time characteristics

Conditions: Ta = 25°C
Vout:100%

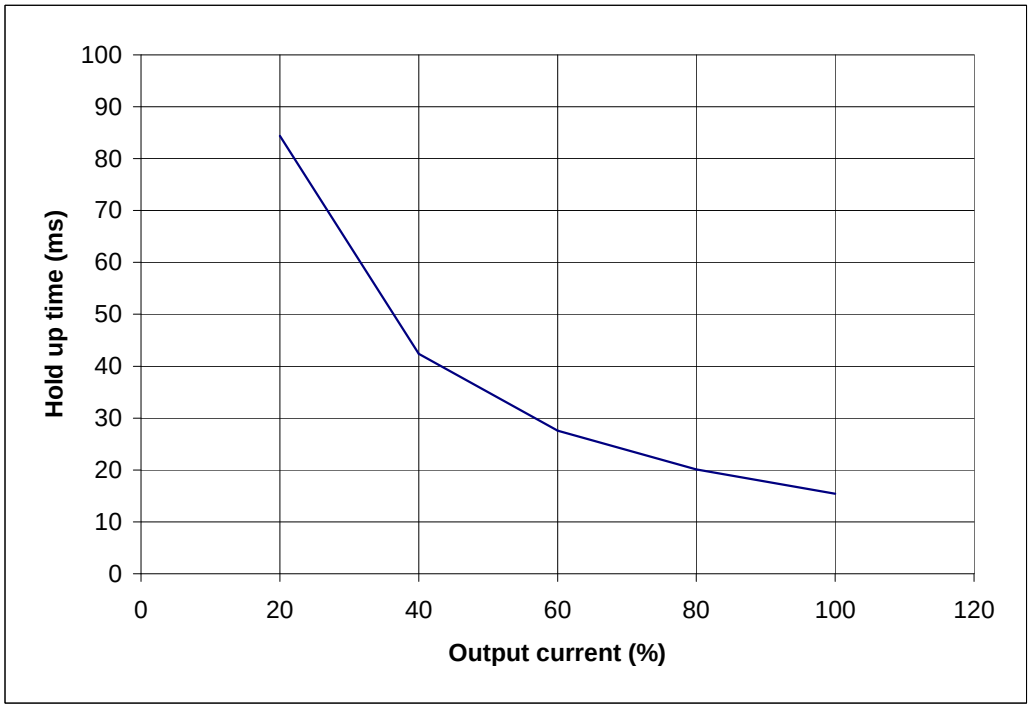
GEN150-16 1Φ 200

Vin:230VAC



GEN150-16 3Φ 200

Vin:230VAC

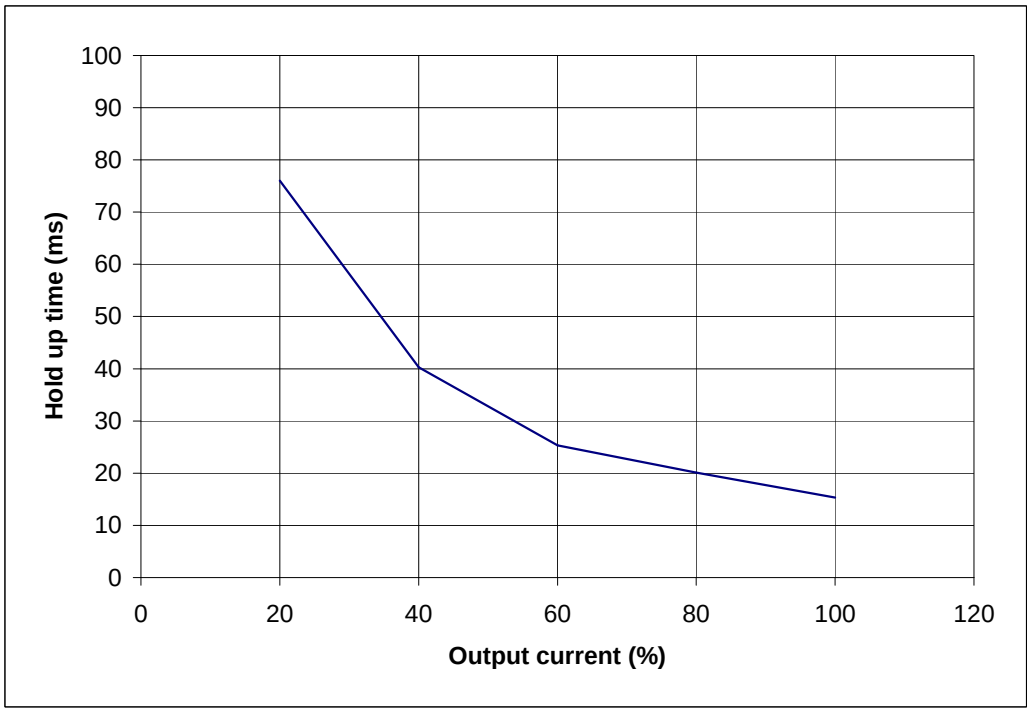


2.6 Hold up time characteristics

Conditions: Ta = 25°C
Vout:100%

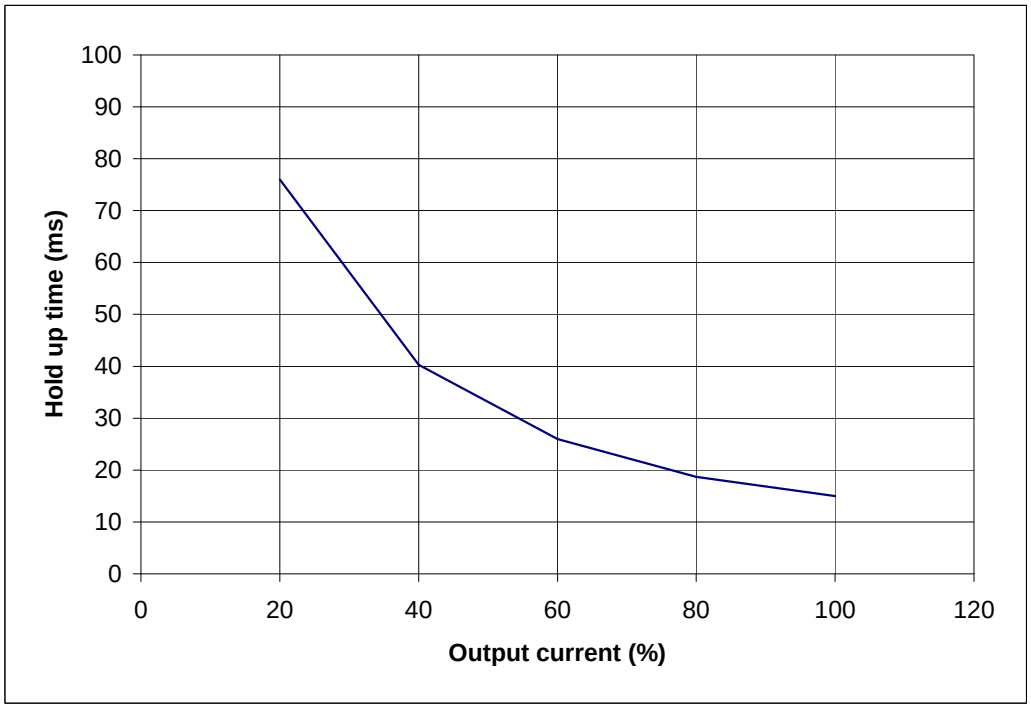
GEN600-4 1Φ 200

Vin:230VAC



GEN600-4 3Φ 200

Vin:230VAC



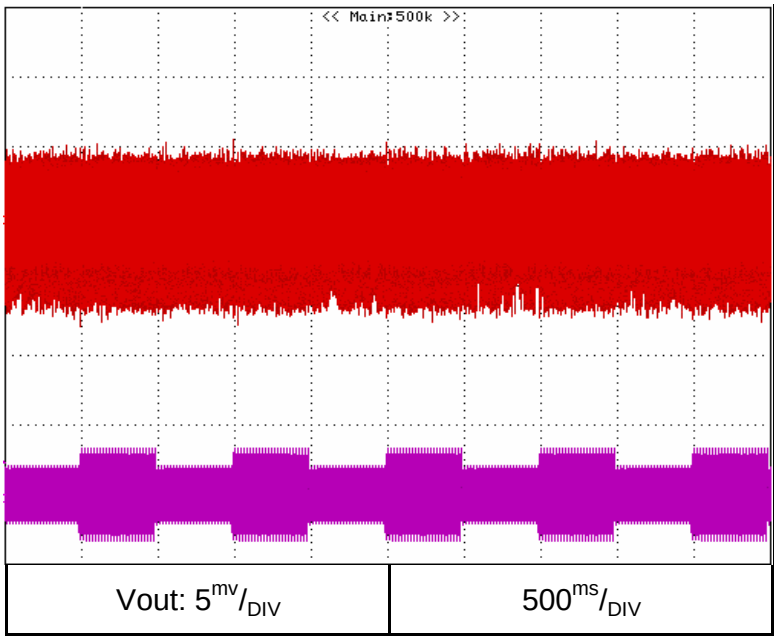
2.7 Dynamic line response characteristics

Ta = 25°C

C.V mode

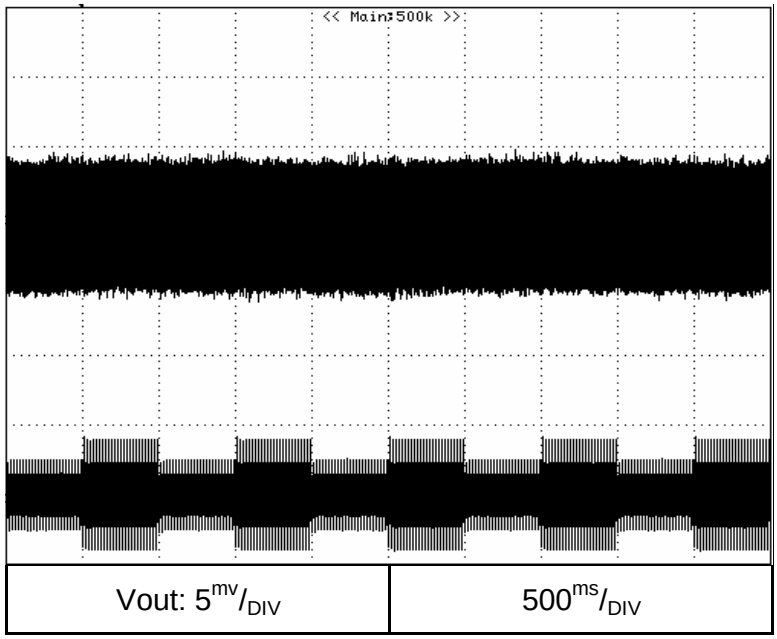
GEN8-300 1Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V



GEN8-300 3Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V

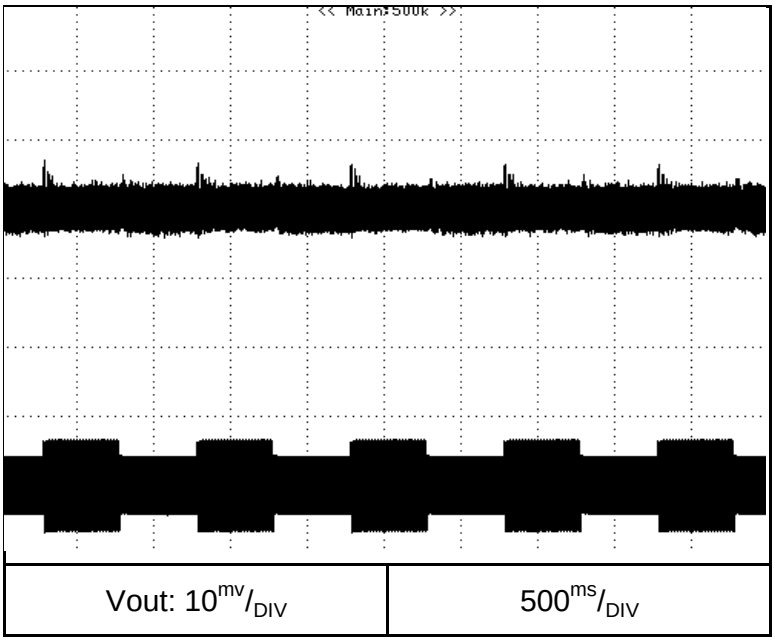


2.7 Dynamic line response characteristics Ta = 25°C

C.V mode

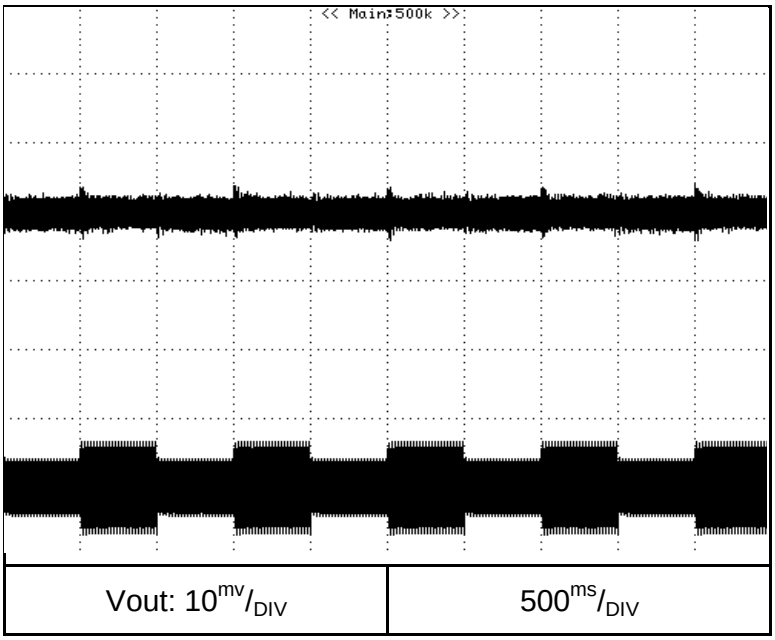
GEN60-40 1Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V



GEN60-40 3Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V

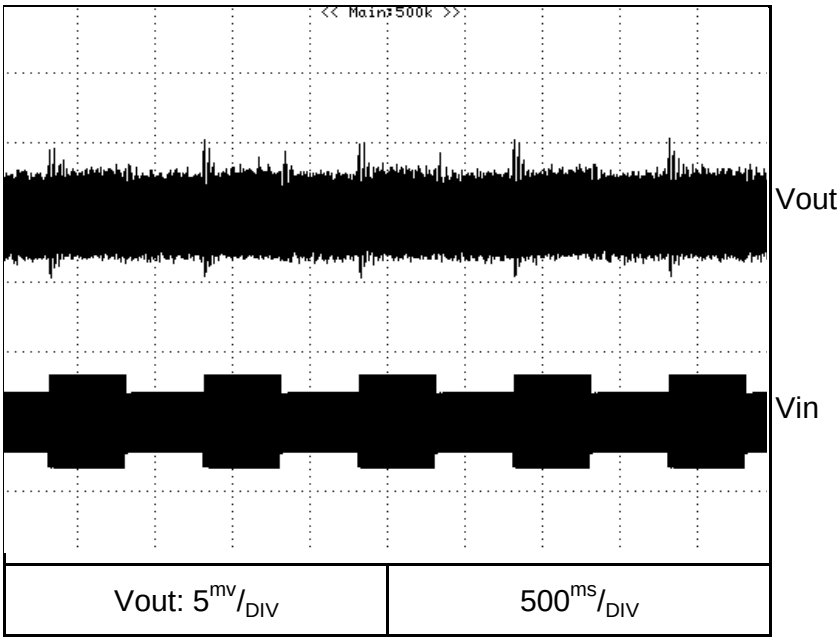


2.7 Dynamic line response characteristics Ta = 25°C

C.V mode

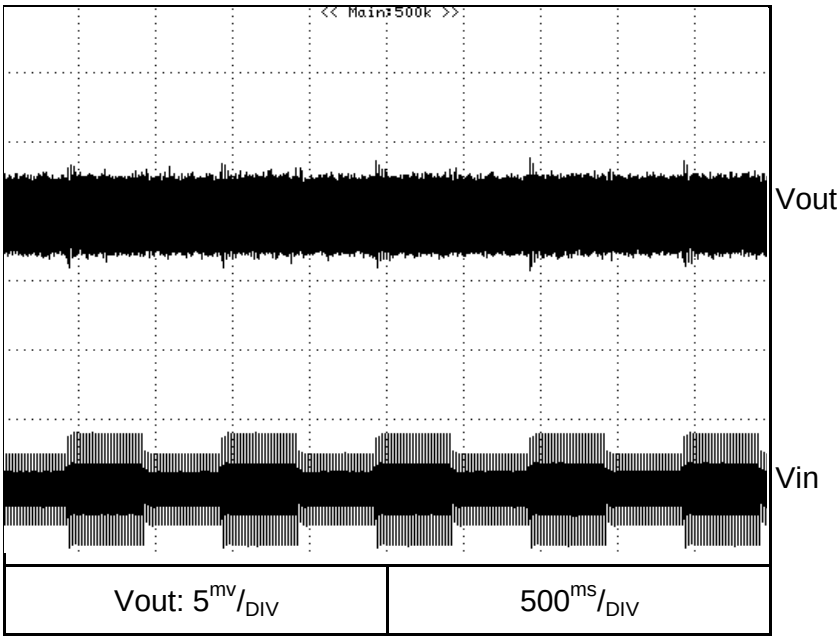
GEN150-16 1Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V



GEN150-16 3Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V

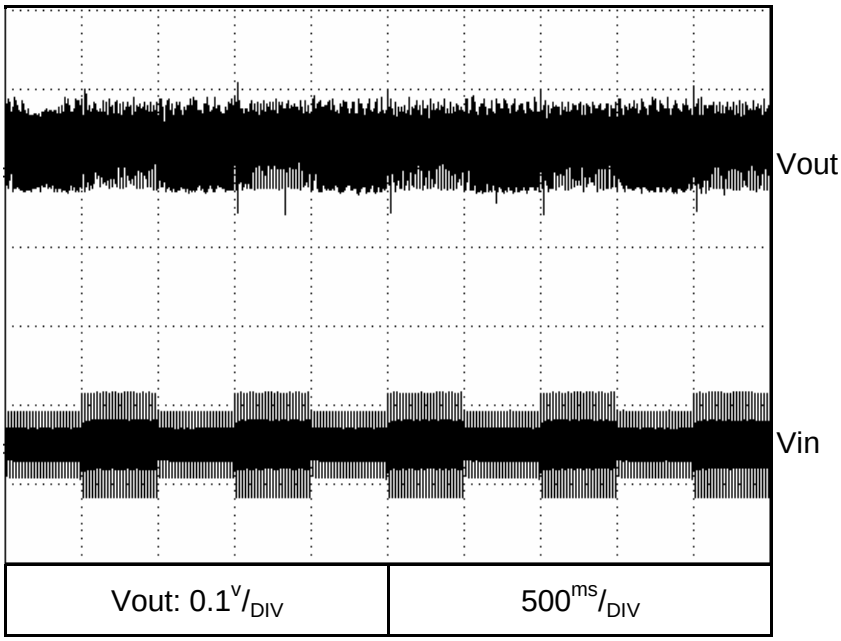


2.7 Dynamic line response characteristics Ta = 25°C

C.V mode

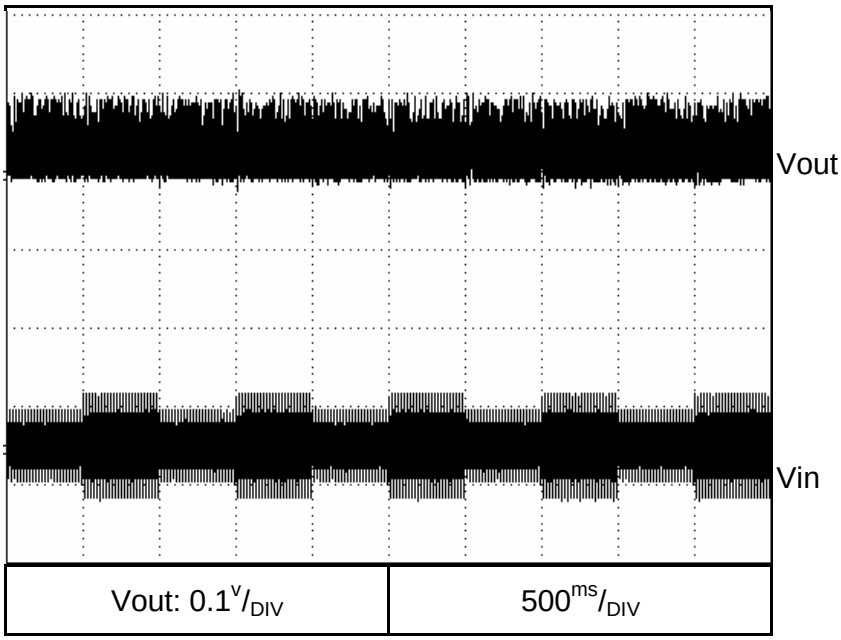
GEN600-4 1Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V



GEN600-4 3Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V



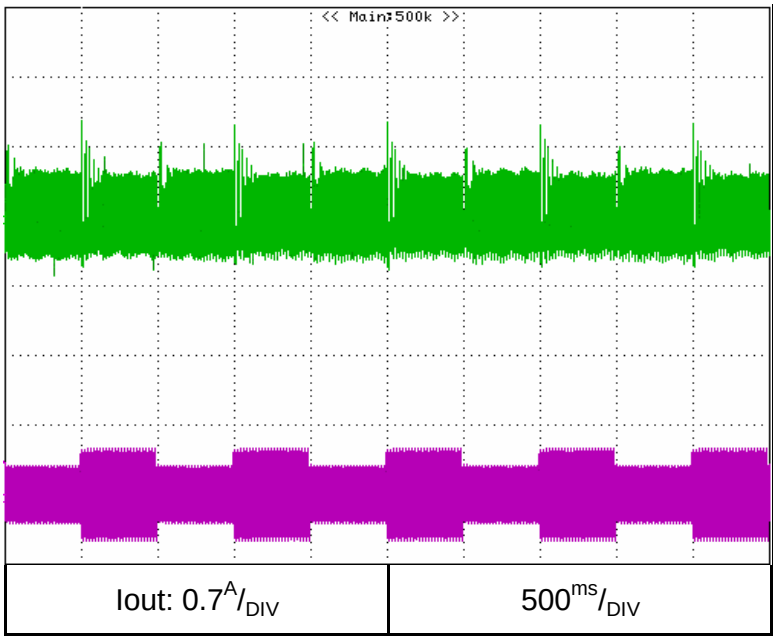
2.7 Dynamic line response characteristics

Ta = 25°C

C.C mode

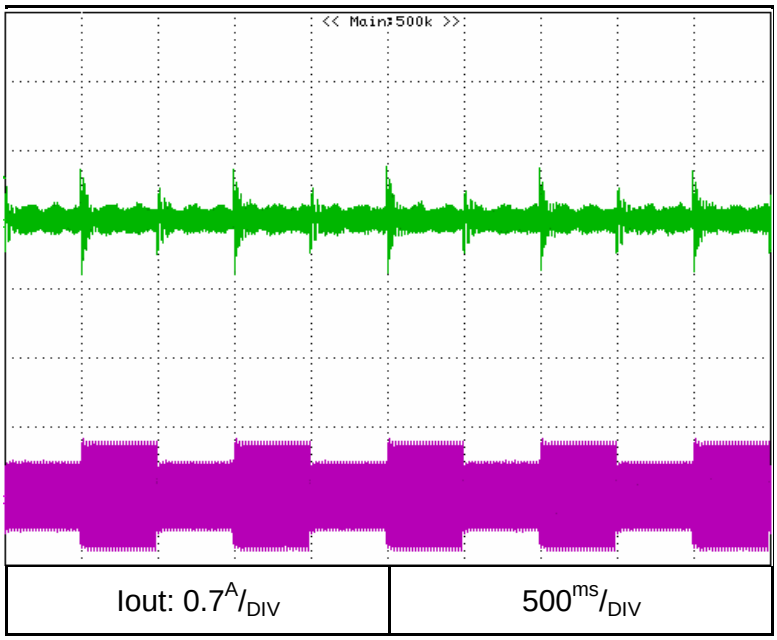
GEN8-300 1Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V



GEN8-300 3Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V

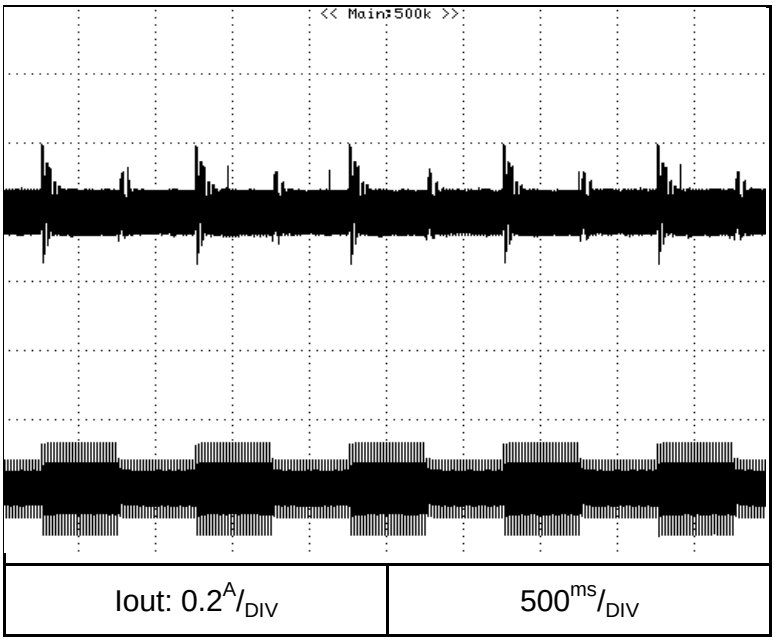


2.7 Dynamic line response characteristics Ta = 25°C

C.C mode

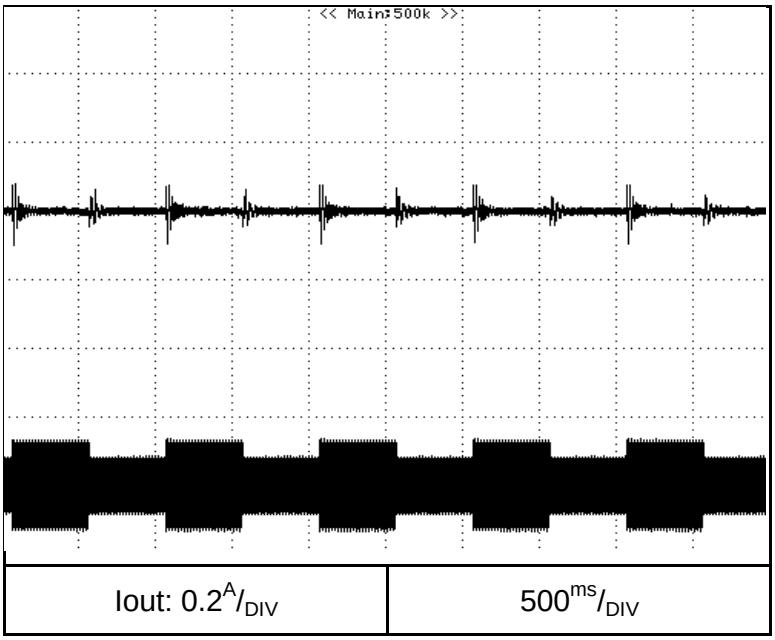
GEN60-40 1Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V



GEN60-40 3Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V

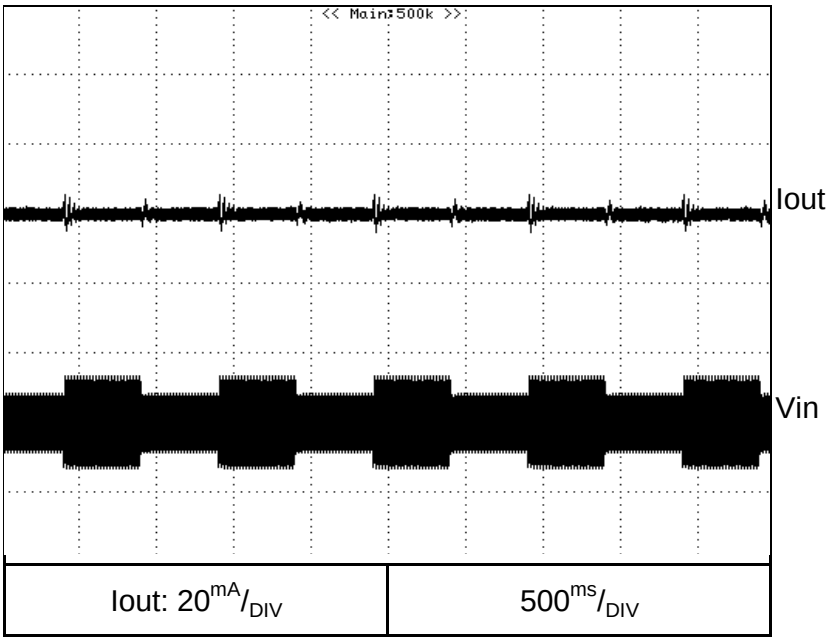


2.7 Dynamic line response characteristics Ta = 25°C

C.C mode

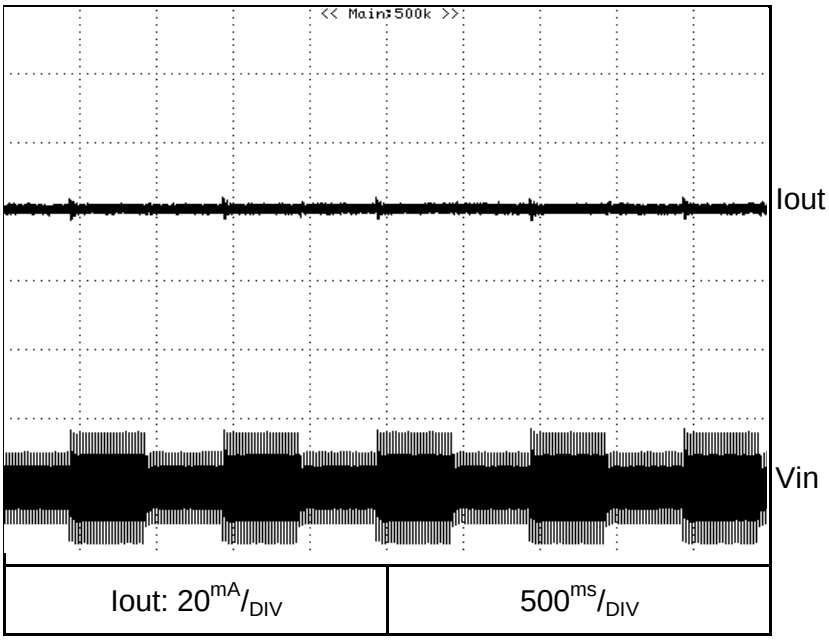
GEN150-16 1Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V



GEN150-16 3Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V

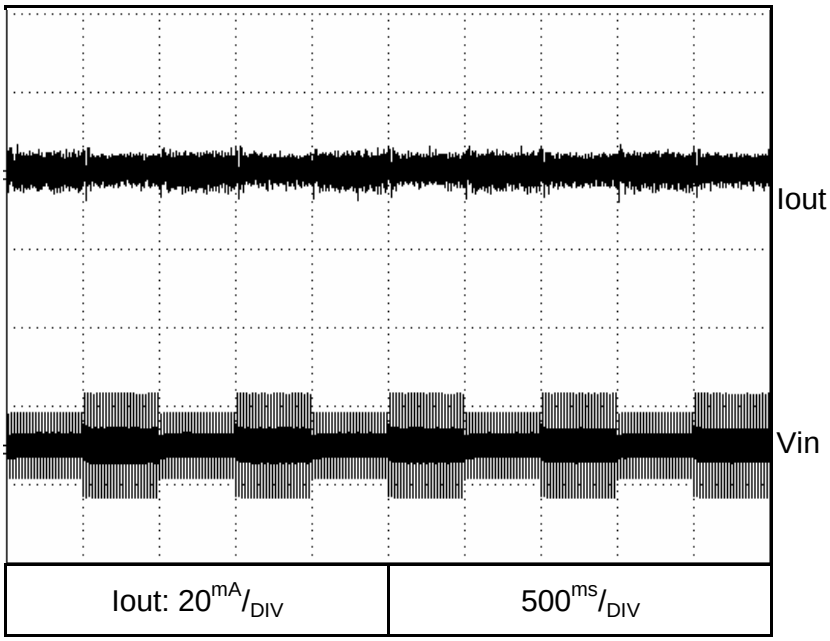


2.7 Dynamic line response characteristics Ta = 25°C

C.C mode

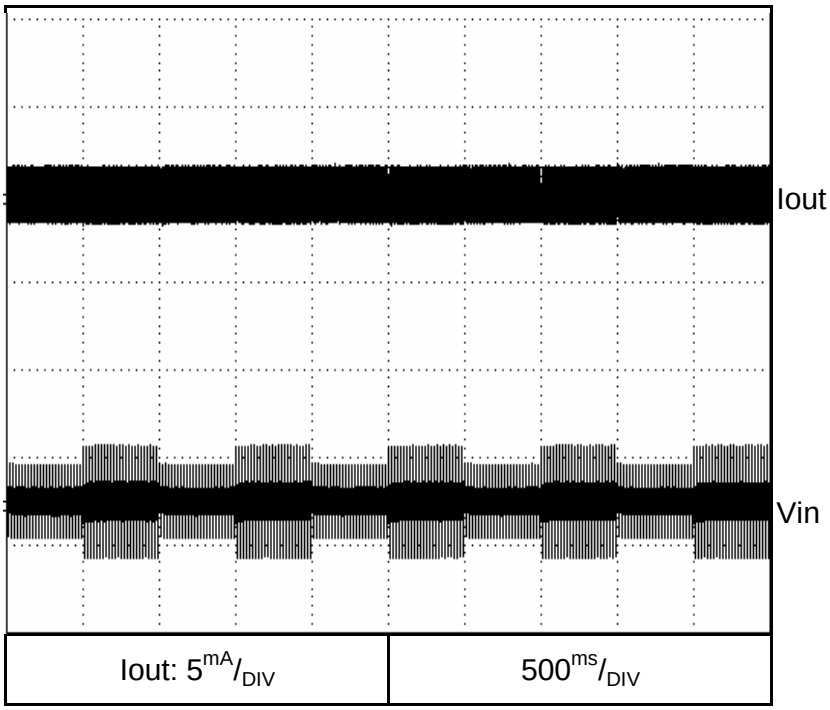
GEN600-4 1Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V



GEN600-4 3Φ 200

Conditions: Vout: 100%
Iout: 100%
Vin:170↔265V

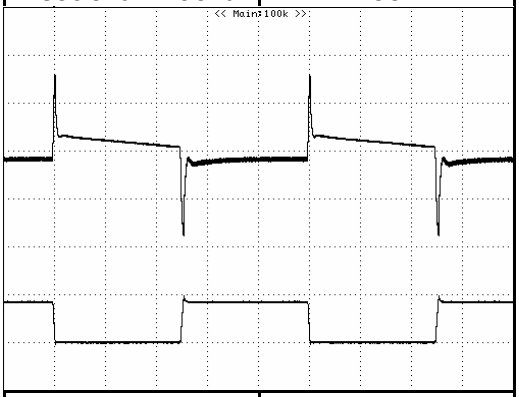


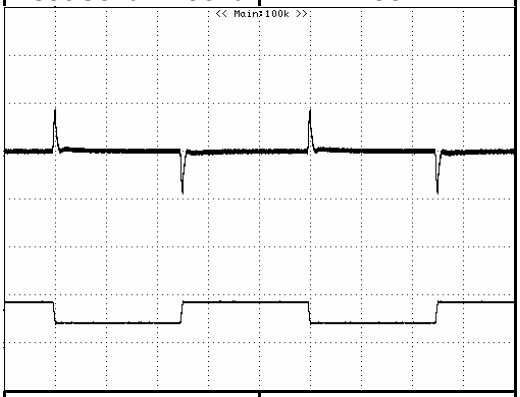
2.8 Dynamic load response characteristics
C.V mode

Conditions: Vin: Nominal
Vout: 100%
Ta = 25℃

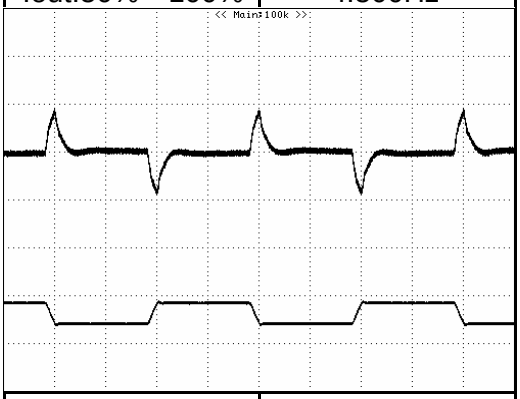
Load current: tr=tf=100us

GEN8-300

Iout:0%↔100%	f:100Hz
	
0.5V/DIV	2ms/DIV
9.96%	-11.26%

Iout:50%↔100%	f:100Hz
	
0.5V/DIV	2ms/DIV
5.73%	-5.80%

Iout:0%↔100%	f:500Hz
	
0.5V/DIV	500us/DIV
9.70%	-10.74%

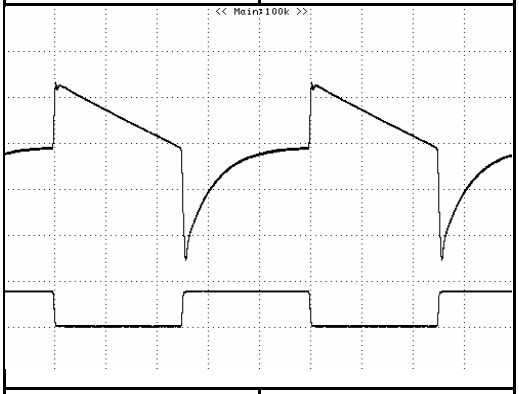
Iout:50%↔100%	f:500Hz
	
0.5V/DIV	500us/DIV
5.66%	-5.73%

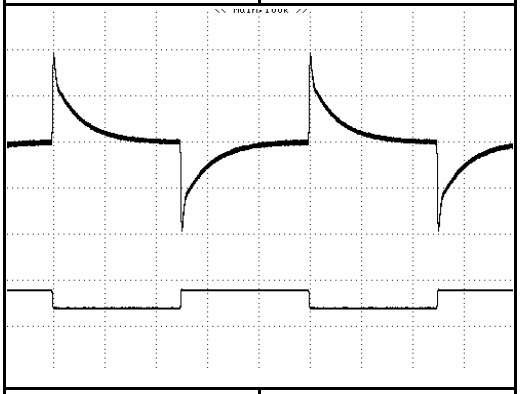
2.8 Dynamic load response characteristics
C.V mode

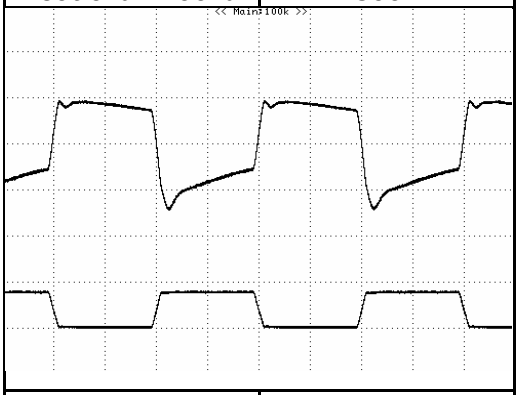
Conditions: Vin: Nominal
Vout: 100%
Ta = 25℃

Load current: tr=tf=100us

GEN60-40

Iout:0%↔100%	f:100Hz
	
$0.5^{V}/_{DIV}$	$2^{ms}/_{DIV}$
1.13%	-2.16%

Iout:50%↔100%	f:100Hz
	
$0.2^{V}/_{DIV}$	$2^{ms}/_{DIV}$
0.66%	-0.66%

Iout:0%↔100%	f:500Hz
	
$0.5^{V}/_{DIV}$	$500^{us}/_{DIV}$
0.80%	-1.22%

Iout:50%↔100%	f:500Hz
	
$0.2^{V}/_{DIV}$	$500^{us}/_{DIV}$
0.55%	-0.53%

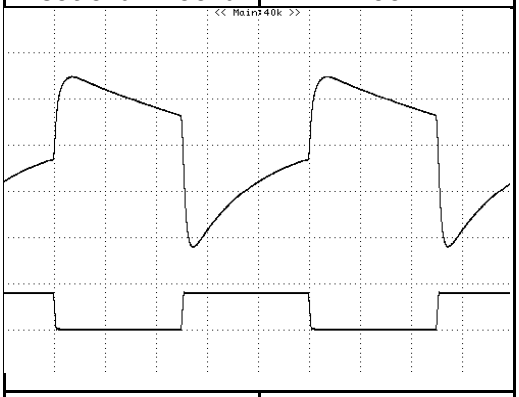
2.8 Dynamic load response characteristics

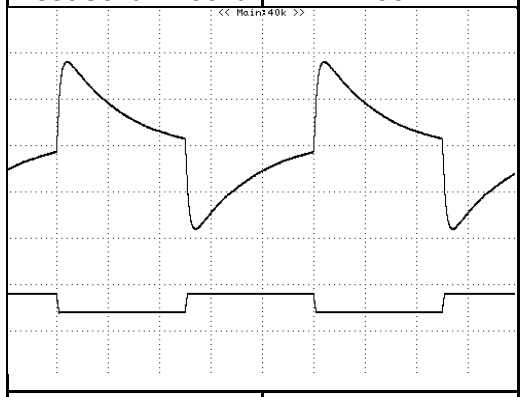
C.V mode

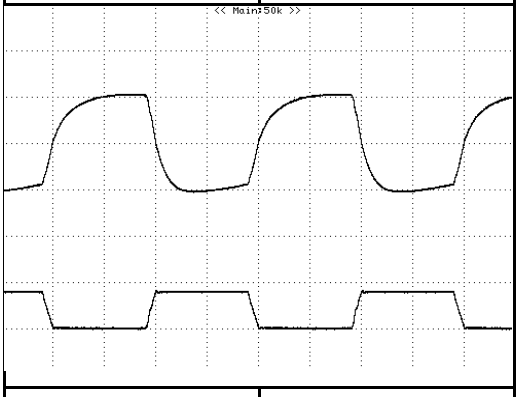
Conditions: Vin: Nominal
Vout: 100%
Ta = 25℃

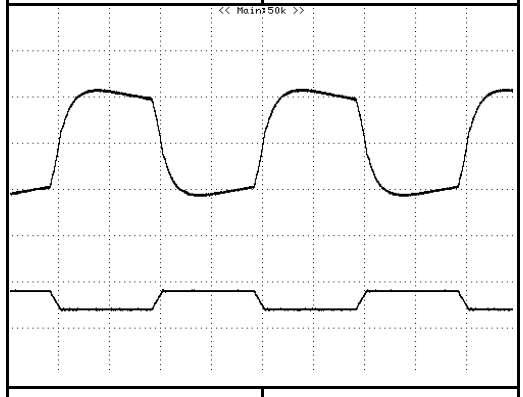
Load current: tr=tf=100us

GEN150-16

Iout:0%↔100%	f:100Hz
	
$0.5^{V}/_{DIV}$	$2^{ms}/_{DIV}$
0.50%	-0.77%

Iout:50%↔100%	f:100Hz
	
$0.2^{V}/_{DIV}$	$2^{ms}/_{DIV}$
0.25%	-0.25%

Iout:0%↔100%	f:500Hz
	
$0.5^{V}/_{DIV}$	$500^{us}/_{DIV}$
0.37%	-0.37%

Iout:50%↔100%	f:500Hz
	
$0.2^{V}/_{DIV}$	$500^{us}/_{DIV}$
0.16%	-0.17%

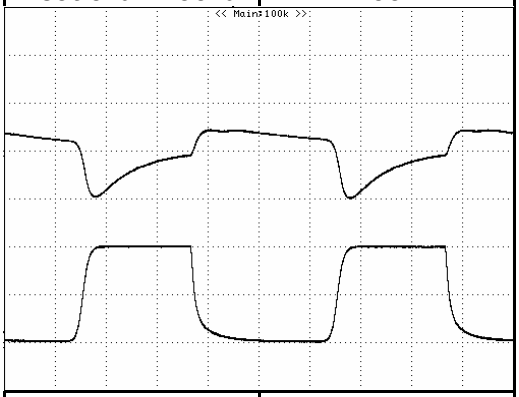
2.8 Dynamic load response characteristics

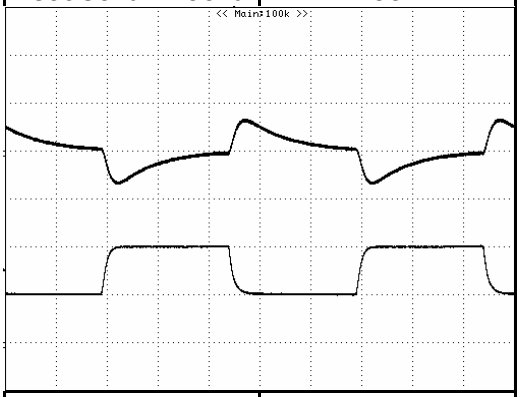
C.V mode

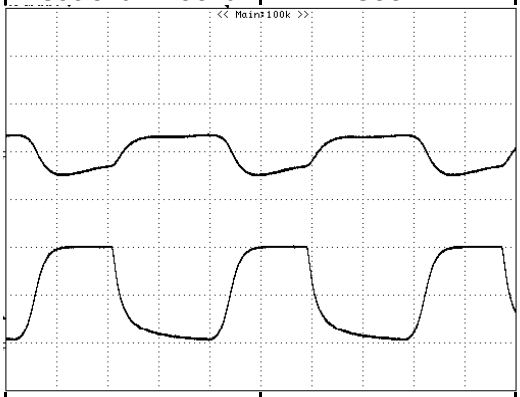
Conditions: Vin: Nominal
Vout: 100%
Ta = 25℃

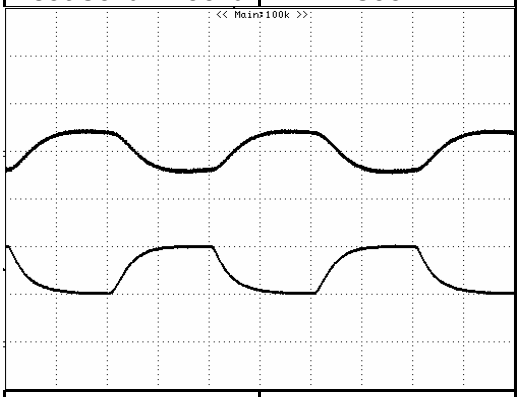
Load current: tr=tf=100us

GEN600-4

Iout:0%↔100%	f:100Hz
	
$5^{V}/_{DIV}$	$2^{ms}/_{DIV}$
0.38%	-0.83%

Iout:50%↔100%	f:100Hz
	
$2^{V}/_{DIV}$	$2^{ms}/_{DIV}$
0.23%	-0.24%

Iout:0%↔100%	f:500Hz
	
$5^{V}/_{DIV}$	$500^{us}/_{DIV}$
0.32%	-0.32%

Iout:50%↔100%	f:500Hz
	
$2^{V}/_{DIV}$	$500^{us}/_{DIV}$
0.16%	-0.16%

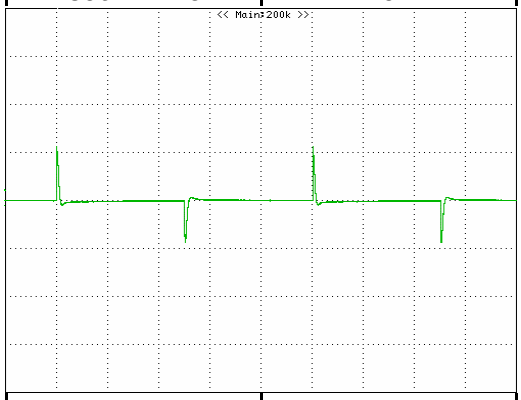
2.8 Dynamic load response characteristics
C.C mode

Conditions: Vin: Nominal
Ta = 25℃

GEN8-300

Io=300A

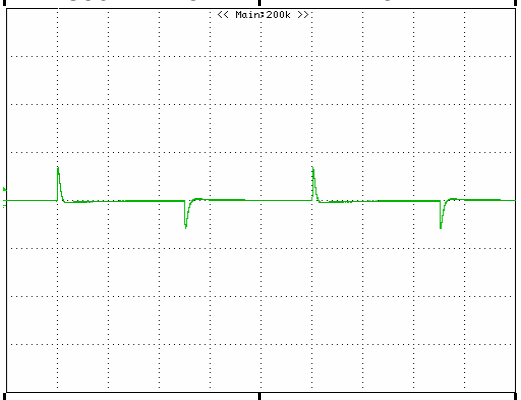
Vout:7.2↔6V	f:10Hz



$35^{A}/_{DIV}$	$20^{ms}/_{DIV}$
13.42%	-10.50%

Io=150A

Vout:7.2↔6V	f:10Hz

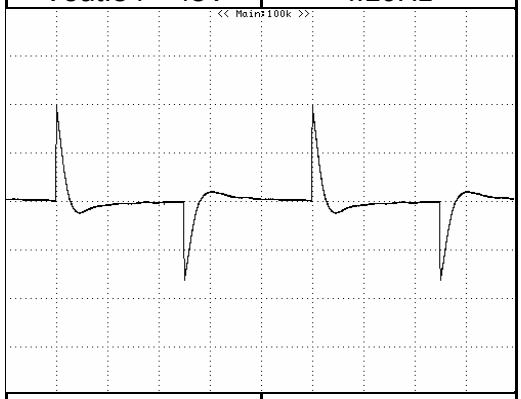


$35^{A}/_{DIV}$	$20^{ms}/_{DIV}$
8.17%	-7.00%

GEN60-40

Io=40A

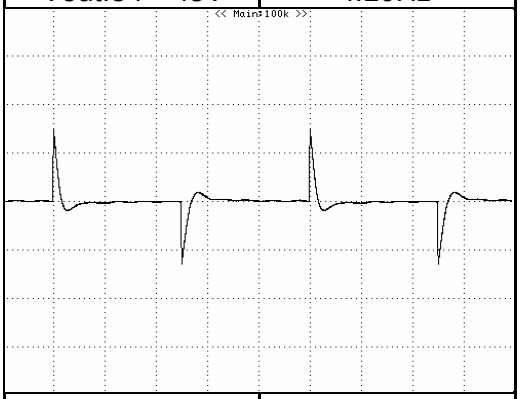
Vout:54↔45V	f:10Hz



$2^{A}/_{DIV}$	$20^{ms}/_{DIV}$
7.50%	-6.50%

Io=20A

Vout:54↔45V	f:10Hz



$2^{A}/_{DIV}$	$20^{ms}/_{DIV}$
10.00%	-8.50%

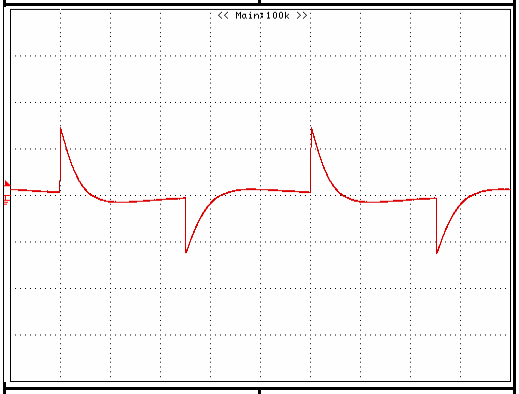
2.8 Dynamic load response characteristics
C.C mode

Conditions: Vin: Nominal
Ta = 25℃

GEN150-16

Io=16A

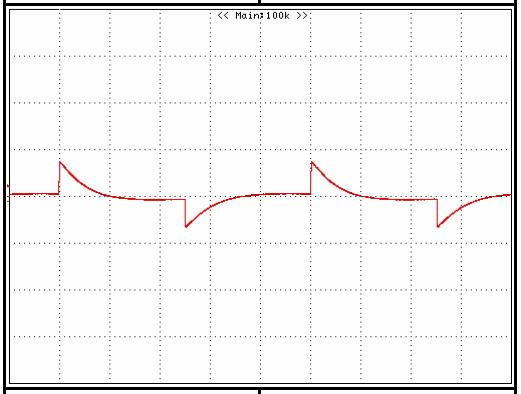
Vout:135↔112.5V	f:10Hz



$2^{A}/_{DIV}$	$20^{ms}/_{DIV}$
18.75%	-16.25%

Io=8A

Vout:135↔112.5V	f:10Hz

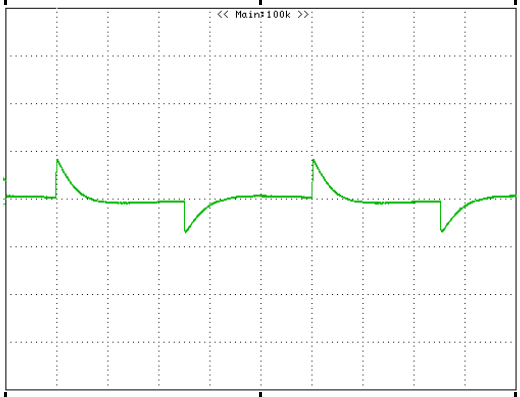


$2^{A}/_{DIV}$	$20^{ms}/_{DIV}$
15.00%	-12.50%

GEN600-4

Io=4A

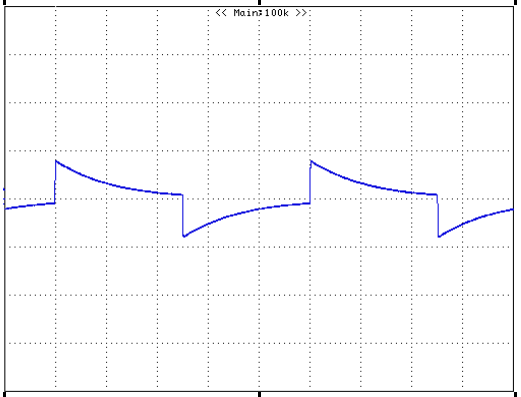
Vout:540↔450V	f:10Hz



$1^{A}/_{DIV}$	$20^{ms}/_{DIV}$
20.00%	-18.75%

Io=2A

Vout:540↔450V	f:10Hz



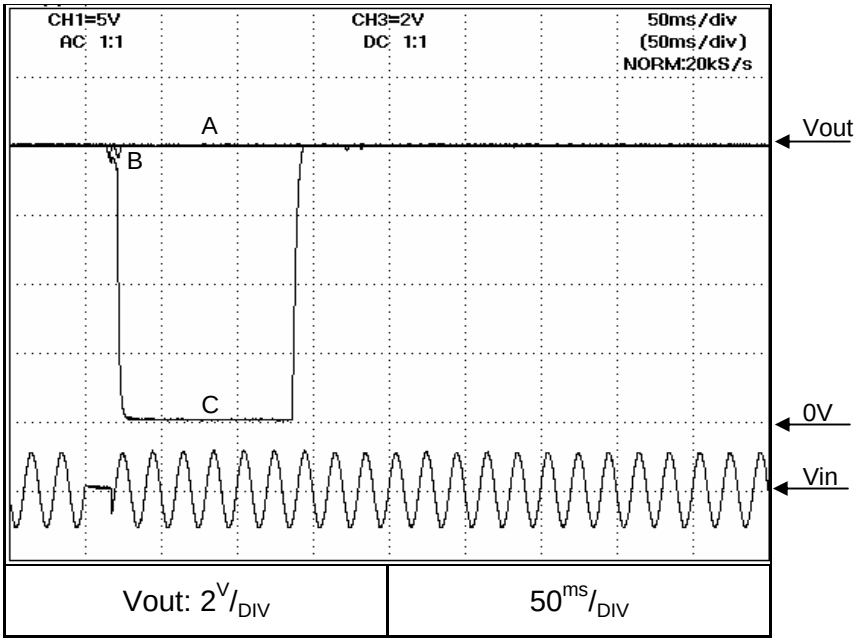
$0.5^{A}/_{DIV}$	$20^{ms}/_{DIV}$
10.00%	-10.00%

2.9 Response to brown-out characteristics
C.V mode

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

GEN8-300 1Φ 200

Vin:230VAC

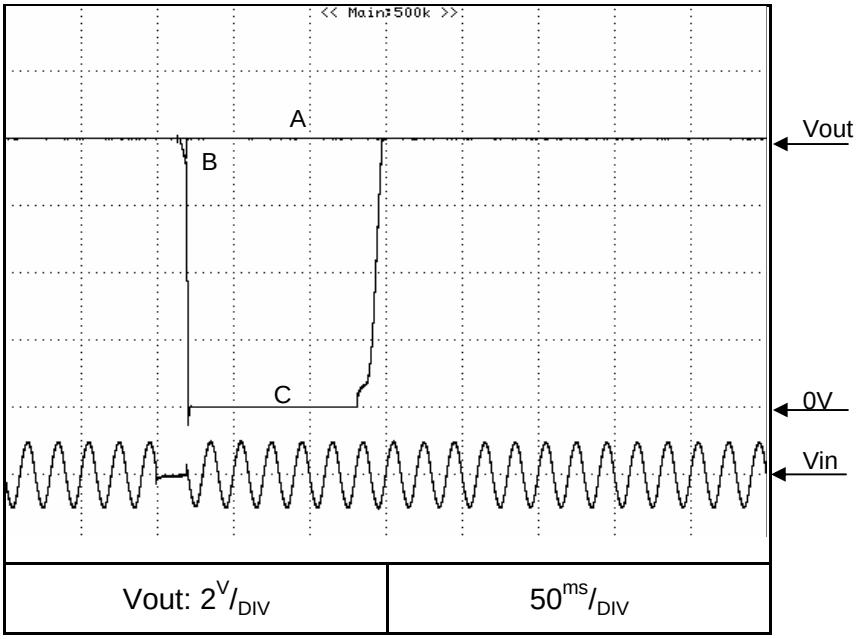


Brown-out time
A -15mS
B -16mS
C -17mS

Vout: $2^{V}/_{DIV}$	$50^{ms}/_{DIV}$

GEN8-300 3Φ 200

Vin:208VAC



Brown-out time
A -15mS
B -16mS
C -17mS

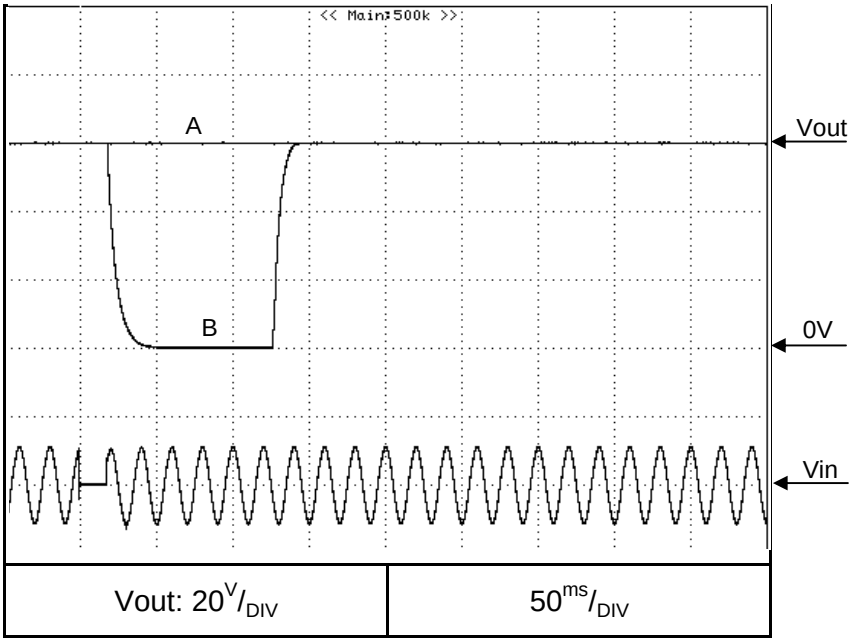
Vout: $2^{V}/_{DIV}$	$50^{ms}/_{DIV}$

2.9 Response to brown-out characteristics
C.V mode

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

GEN60-40 1Φ 200

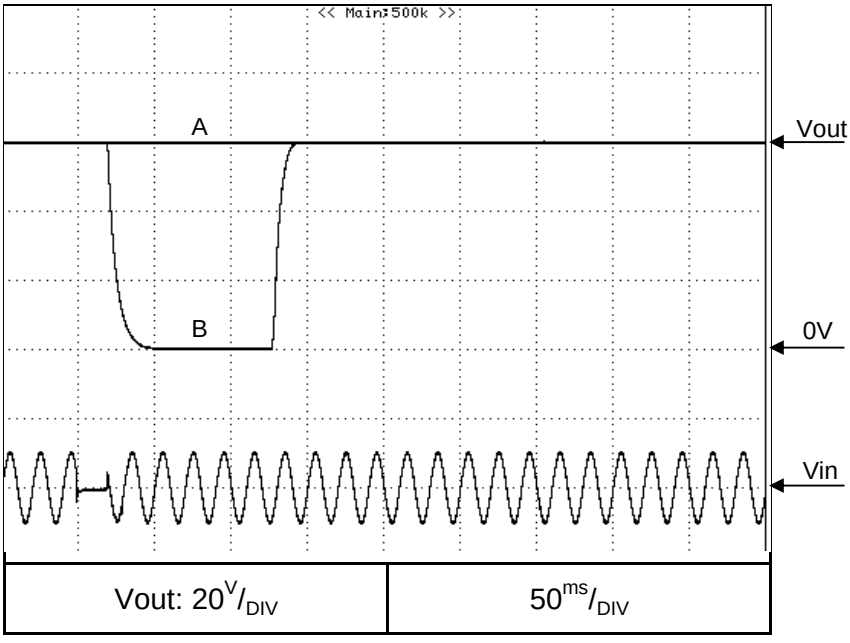
Vin:230VAC



Brown-out time
A - 16ms
B - 17ms

GEN60-40 3Φ 200

Vin:208VAC



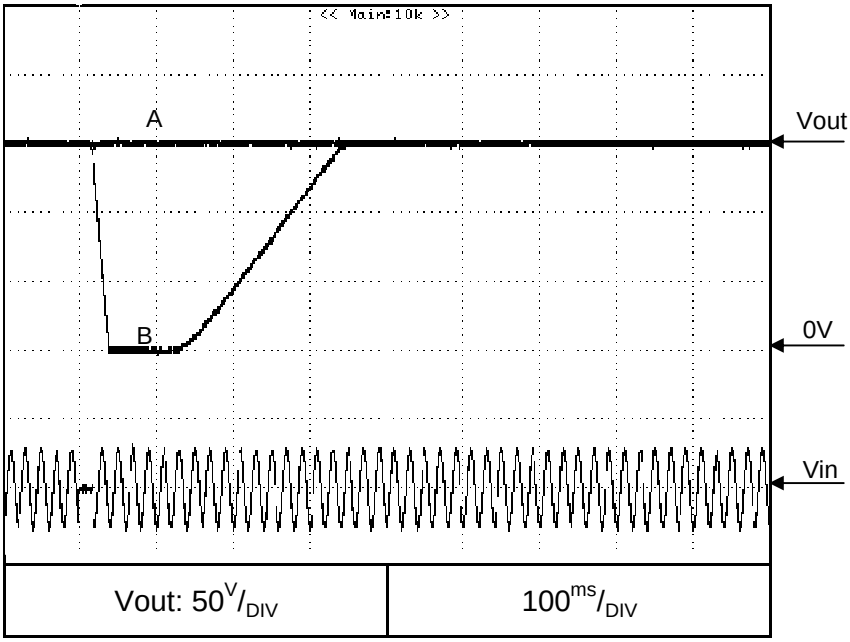
Brown-out time
A - 16ms
B - 17ms

2.9 Response to brown-out characteristics
C.V mode

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

GEN150-16 1Φ 200

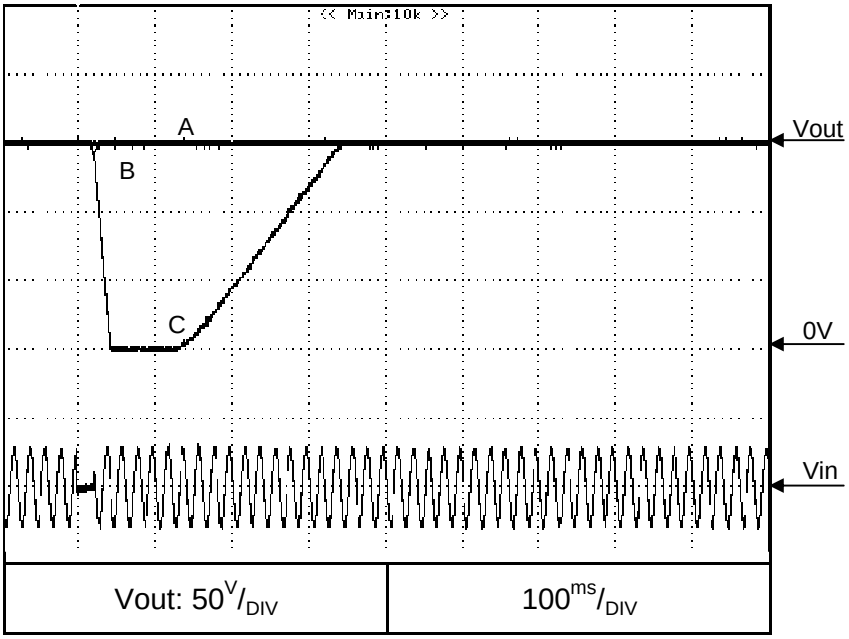
Vin:230VAC



Brown-out time
A - 14ms
B - 15ms

GEN150-16 3Φ 200

Vin:208VAC



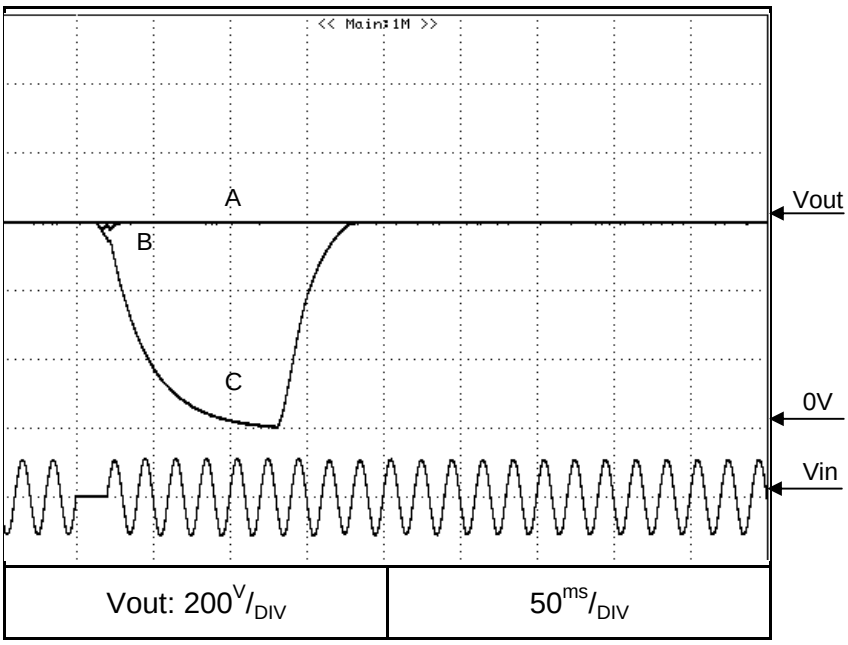
Brown-out time
A -14mS
B -15mS
C -16mS

2.9 Response to brown-out characteristics
C.V mode

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

GEN600-4 1Φ 200

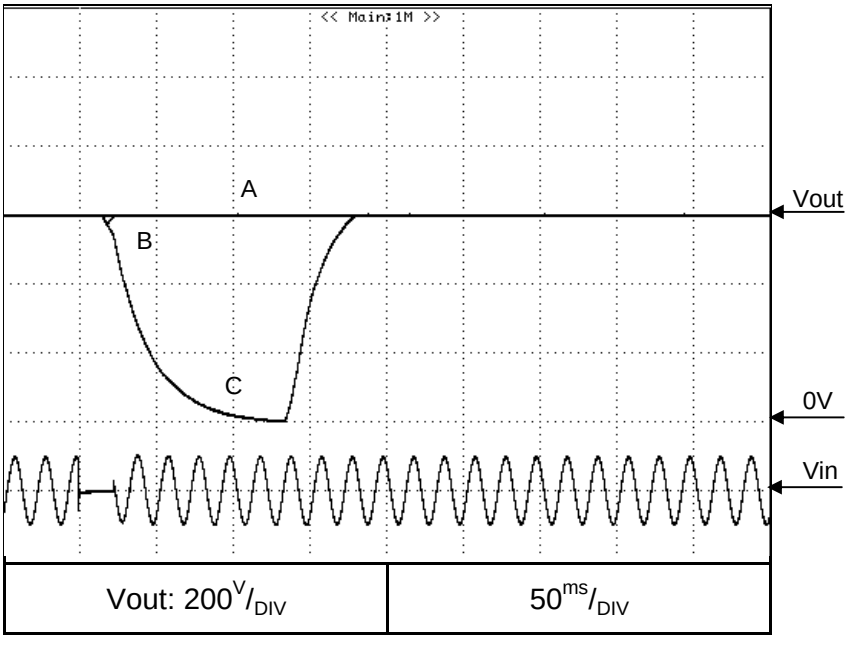
Vin:230VAC



Brown-out time
A -13mS
B -14mS
C -19mS

GEN600-4 3Φ 200

Vin:208VAC



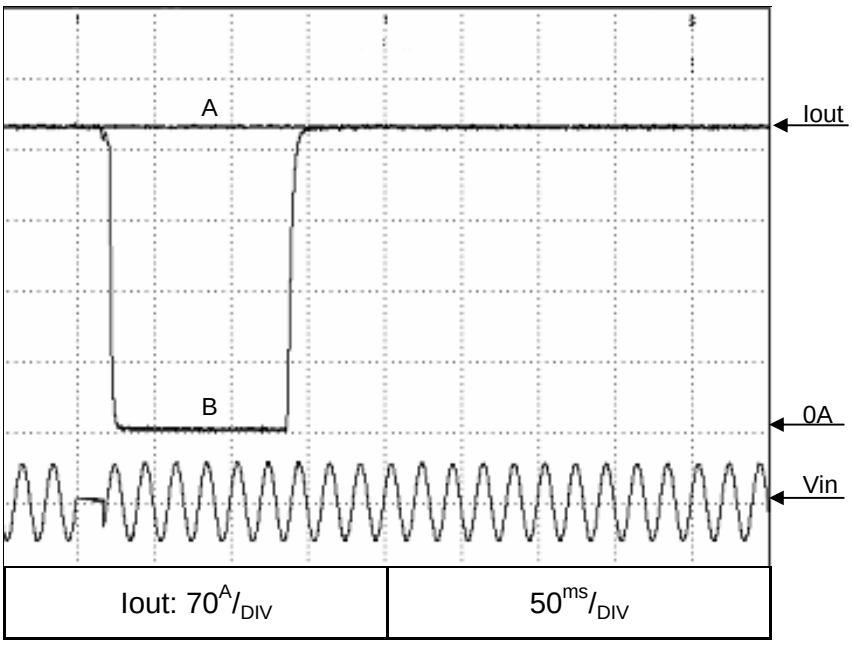
Brown-out time
A -14mS
B -16mS
C -23mS

2.9 Response to brown-out characteristics
C.C mode

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

GEN8-300 1Φ 200

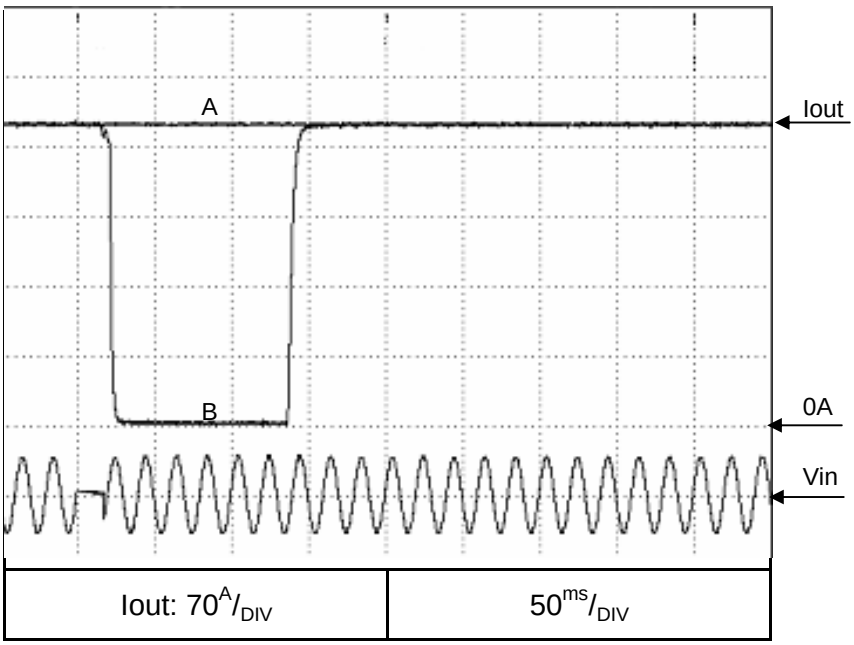
Vin:230VAC



Brown-out time
A -16mS
B -17mS

GEN8-300 3Φ 200

Vin:208VAC



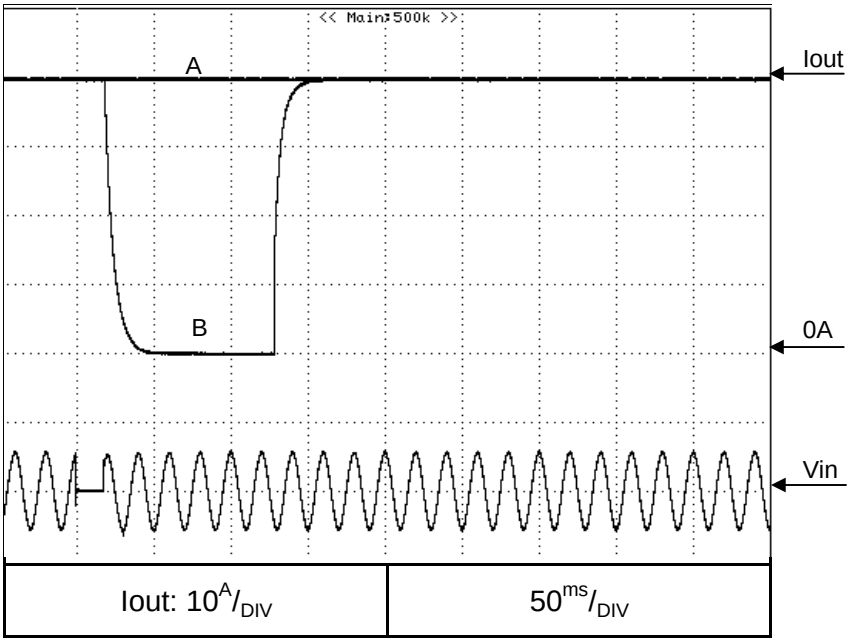
Brown-out time
A -16mS
B -17mS

2.9 Response to brown-out characteristics
C.C mode

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

GEN60-40 1Φ 200

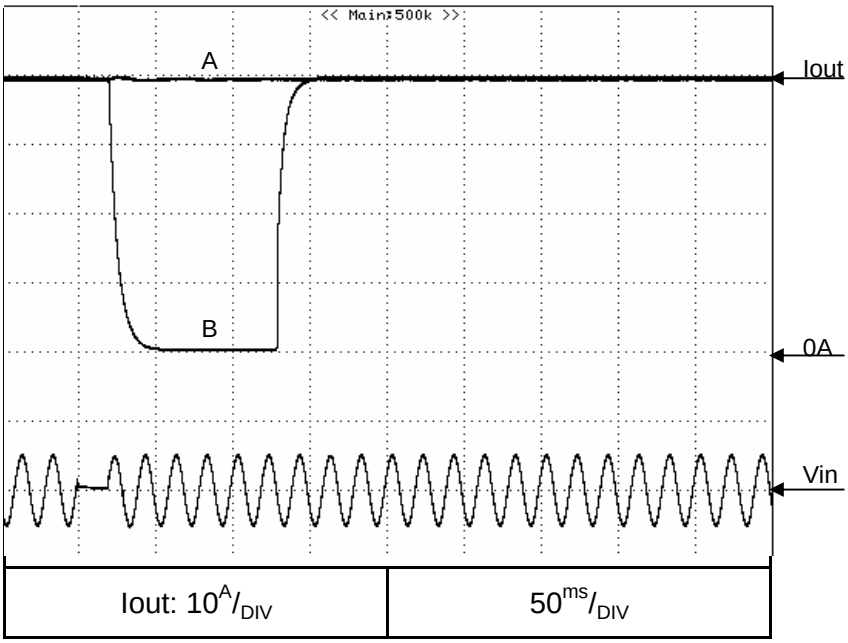
Vin:230VAC



Brown-out time
A - 16ms
B - 17ms

GEN60-40 3Φ 200

Vin:208VAC



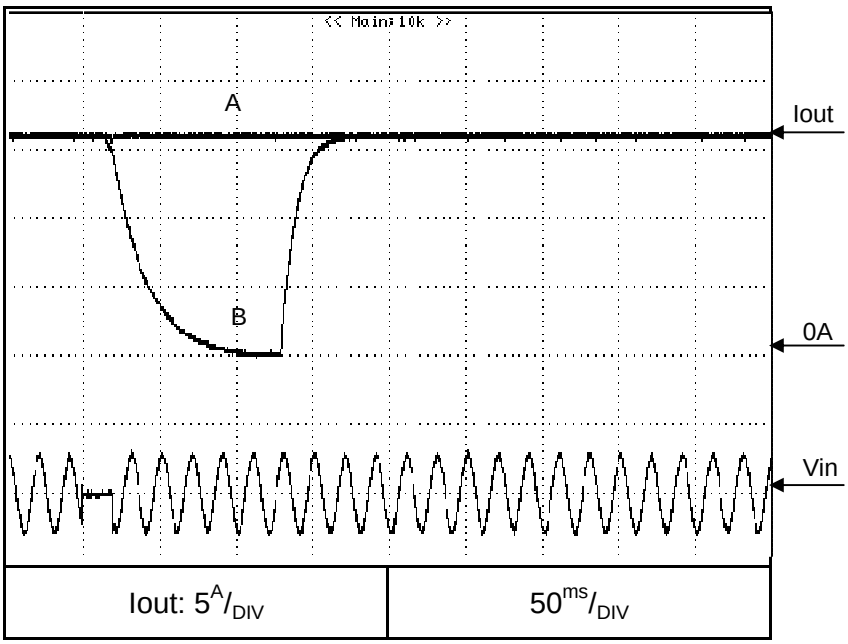
Brown-out time
A - 16ms
B - 17ms

2.9 Response to brown-out characteristics
C.C mode

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

GEN150-16 1Φ 200

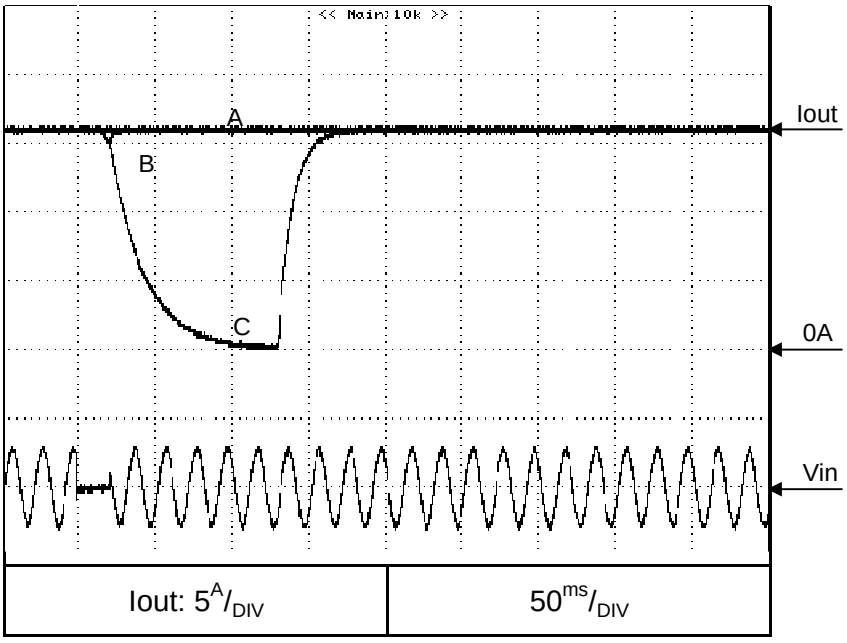
Vin:230VAC



Brown-out time
A - 14ms
B - 15ms

GEN150-16 3Φ 200

Vin:208VAC



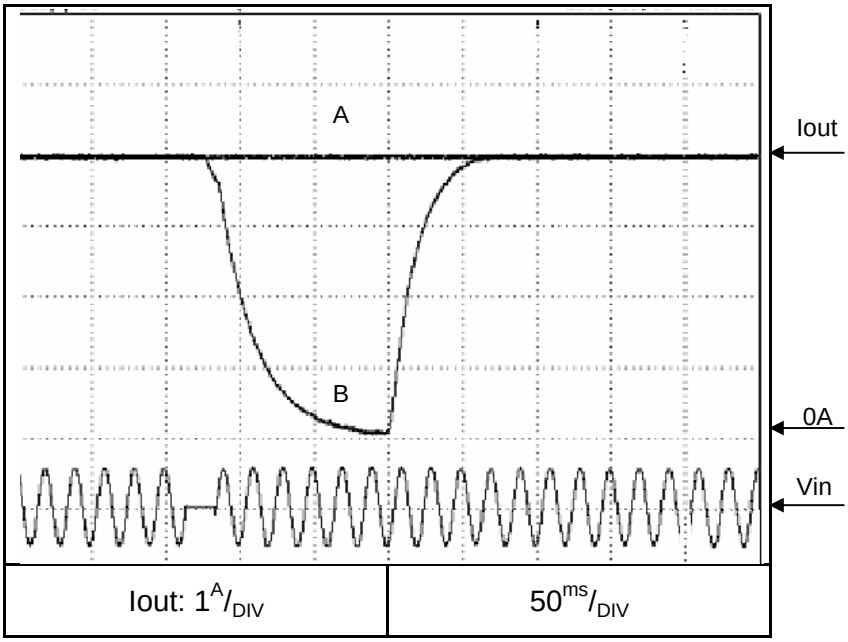
Brown-out time
A -14mS
B -15mS
C -16mS

2.9 Response to brown-out characteristics
C.C mode

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

GEN600-4 1Φ 200

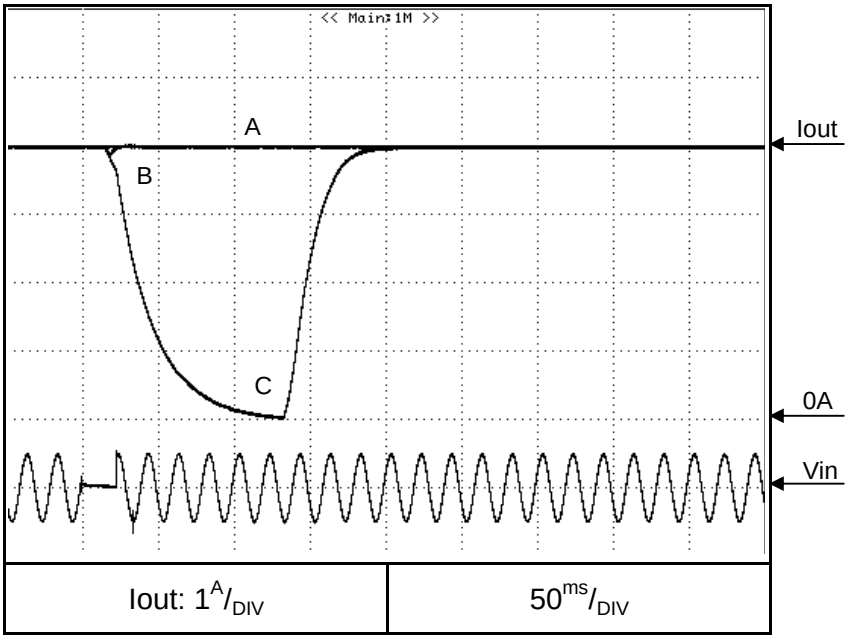
Vin:230VAC



Brown-out time
A -13mS
B -19mS

GEN600-4 3Φ 200

Vin:208VAC

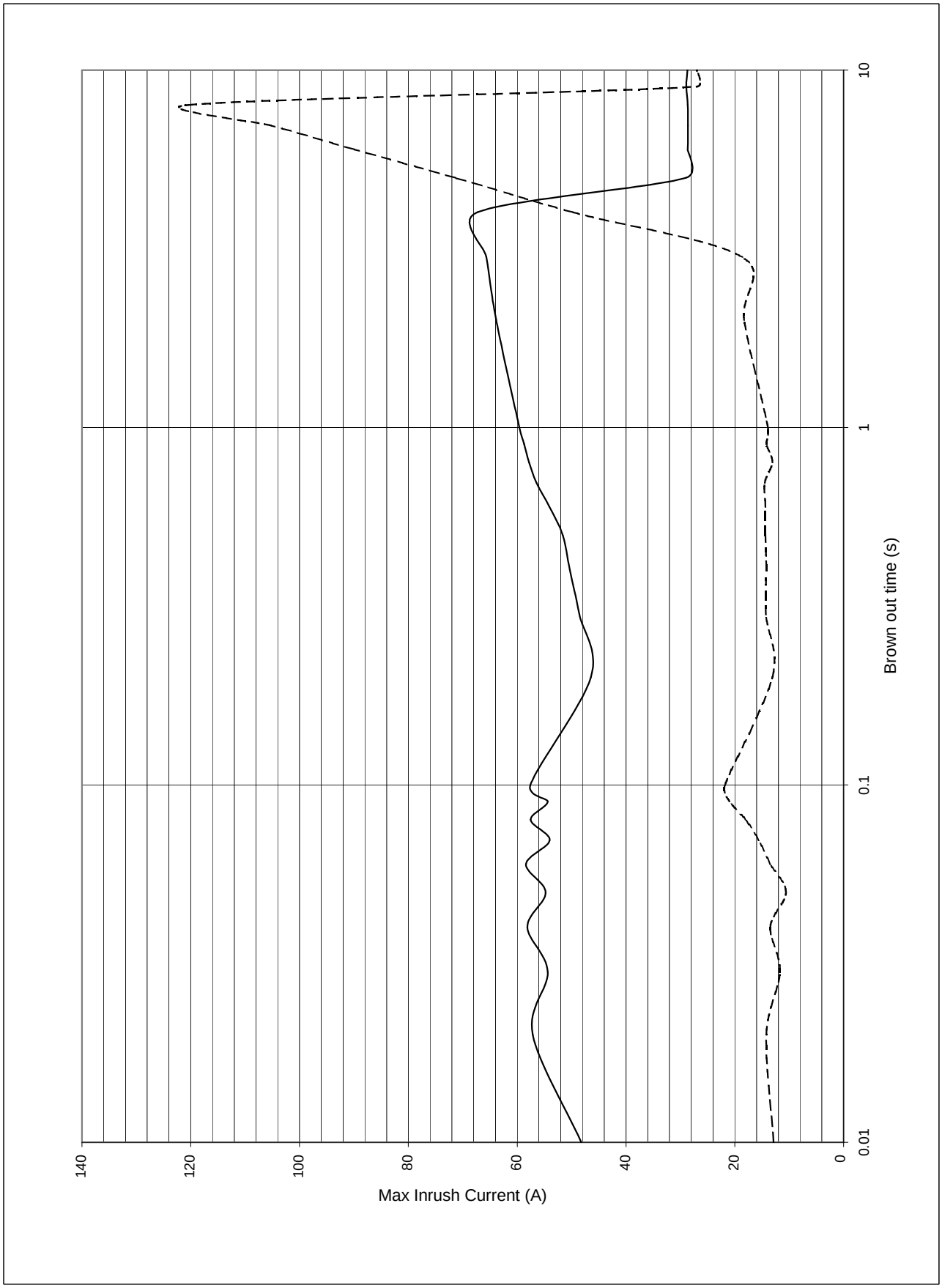


Brown-out time
A -15mS
B -16mS
C -23mS

2.10 Inrush Current Characteristics during line brown outs

Conditions: Vout: 100%
Iout: 0% ----------
Iout: 100% ——————
Vin: 230VAC
Ta = 25℃

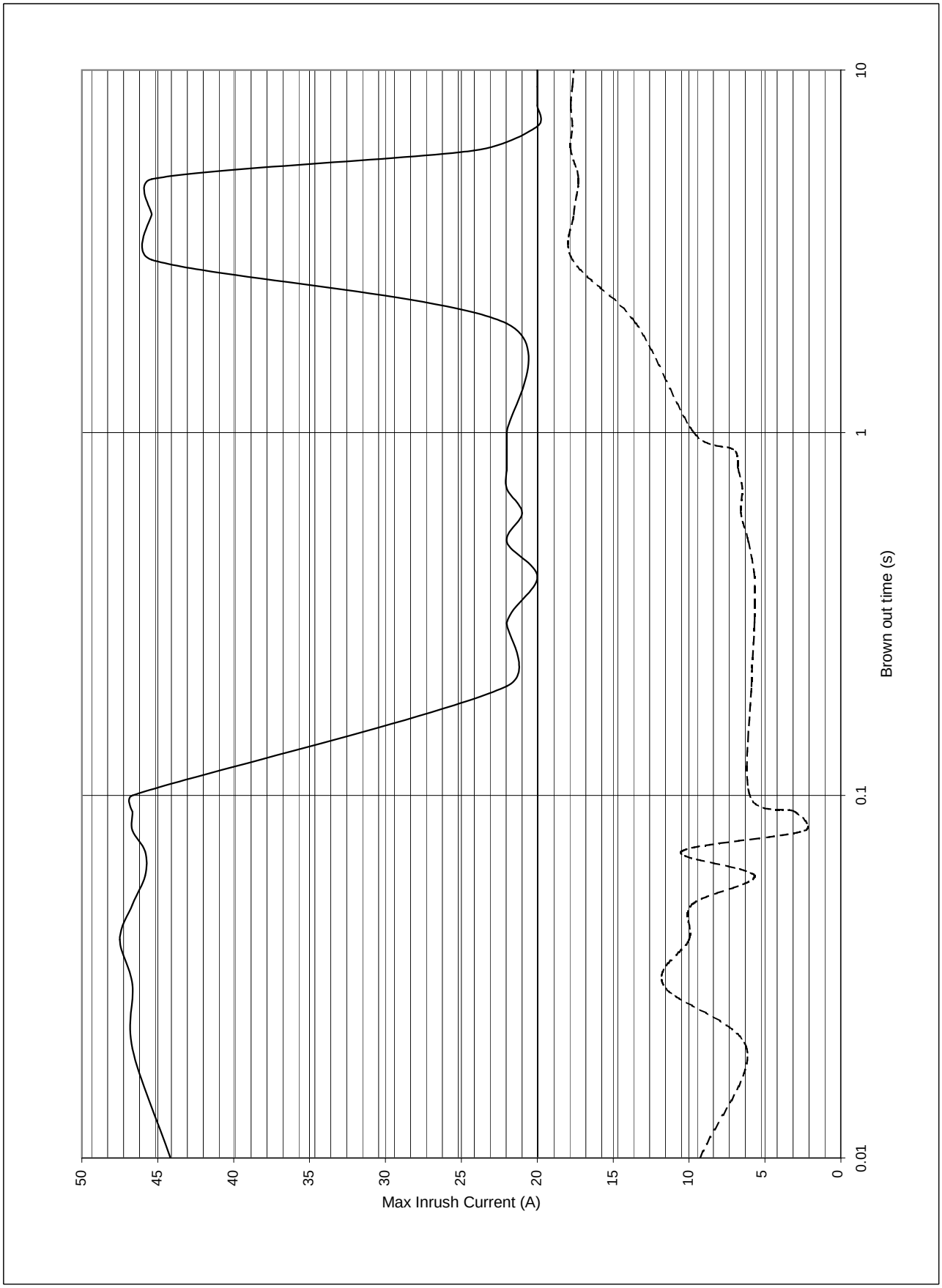
1Φ 230 Input



2.10 Inrush Current Characteristics during line brown outs

Conditions: Vout: 100%
Iout: 0% ----------
Iout: 100% ——————
Vin: 208VAC
Ta = 25℃

3Φ 200 Input



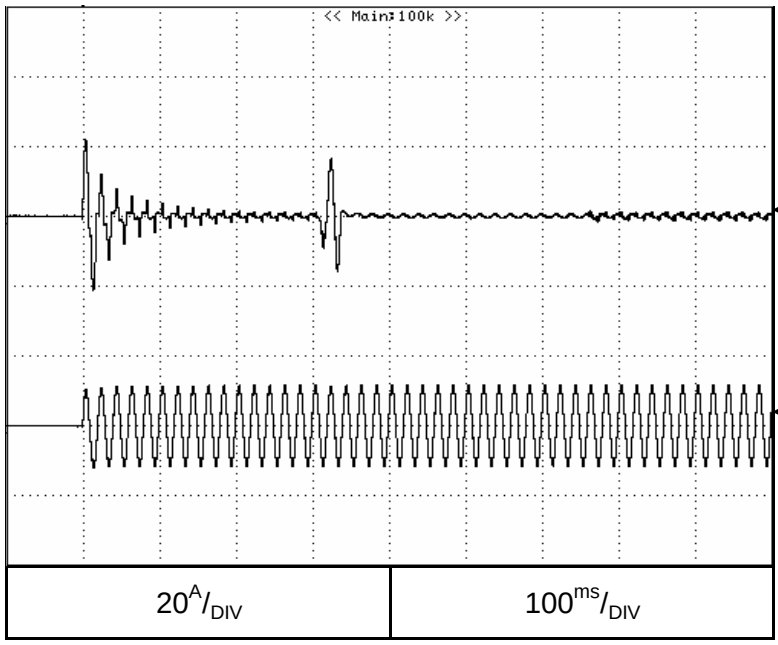
2.11 Inrush current waveform

Conditions: Vin: 200V
Vout: 100%
Iout: 100%
Ta = 25℃

1Φ 230 Input

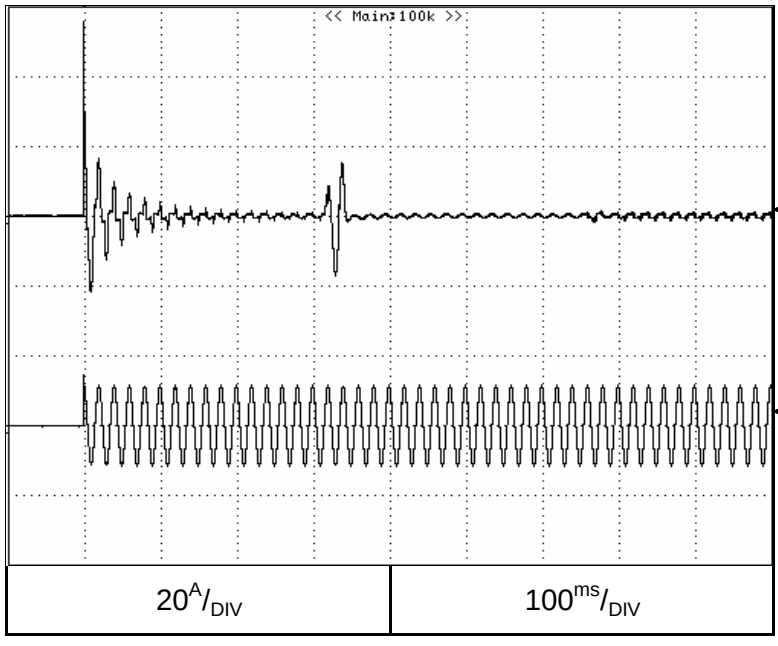
Switch on phase angle of input AC voltage

Φ=0˚



Switch on phase angle of input AC voltage

Φ=90˚



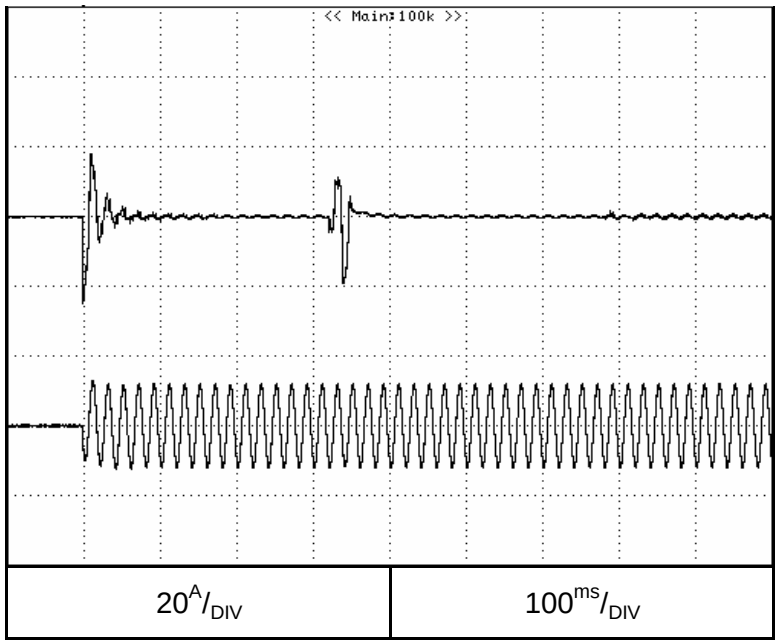
2.11 Inrush current waveform

Conditions: Vin: 200V
Vout: 100%
Iout: 100%
Ta = 25℃

3Φ 200 Input

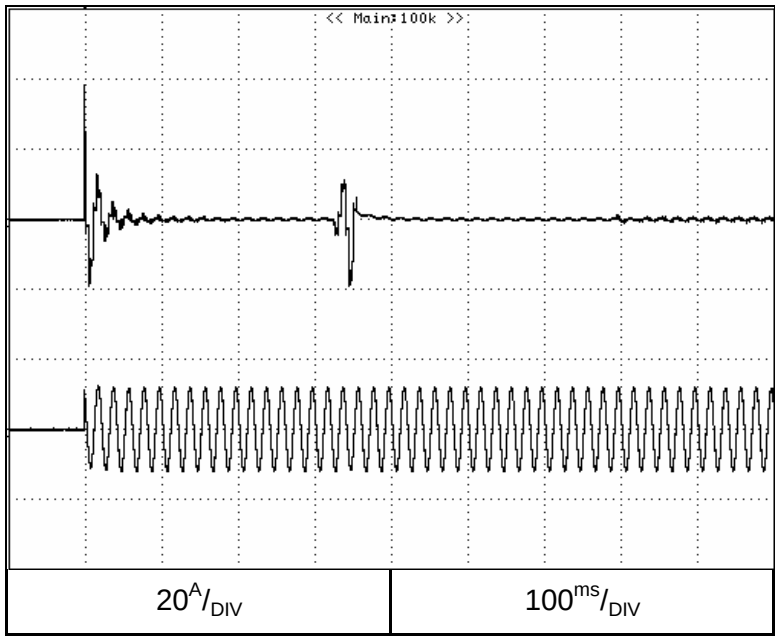
Switch on phase angle of input AC voltage

Φ=0˚



Switch on phase angle of input AC voltage

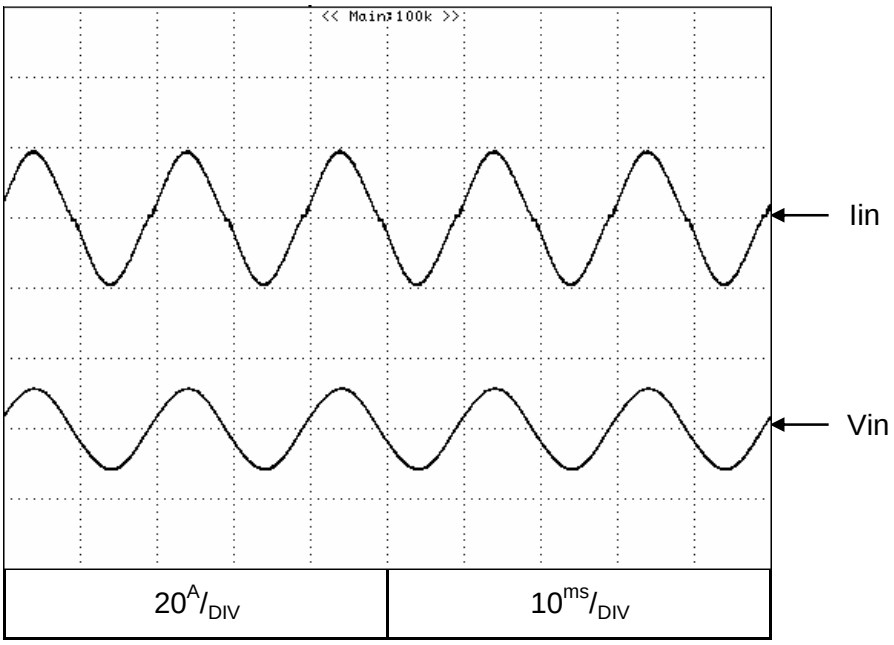
Φ=90˚



2.12 Input current waveform

Conditions: Vin: 230VAC
Vout: 100%
Iout: 100%
Ta = 25℃

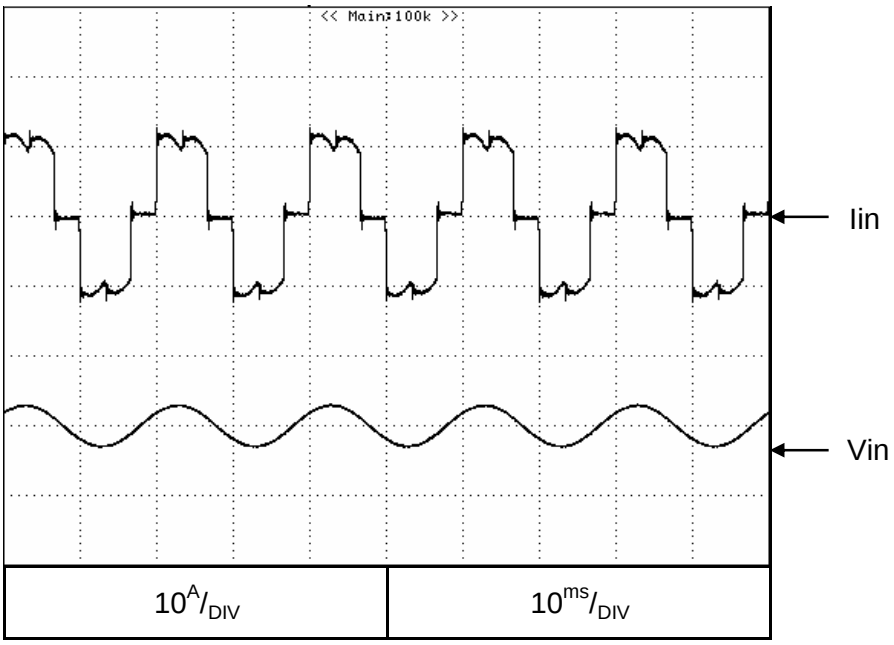
1Φ 230 Input



2.12 Input current waveform

Conditions: Vin: 208VAC
Vout: 100%
Iout: 100%
Ta = 25℃

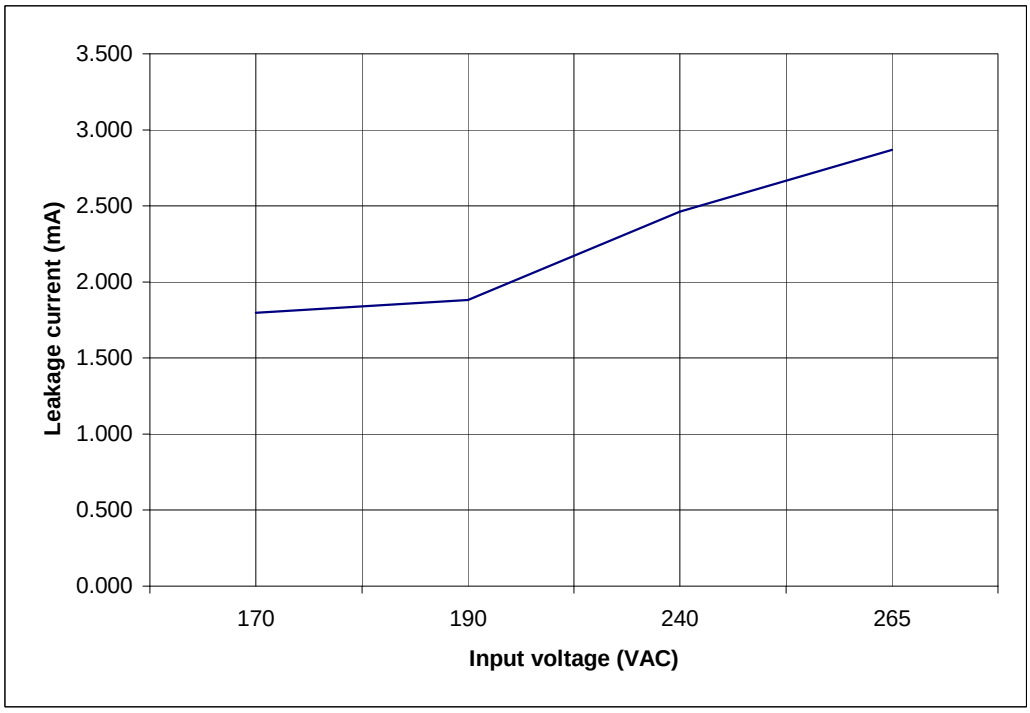
3Φ 200 Input



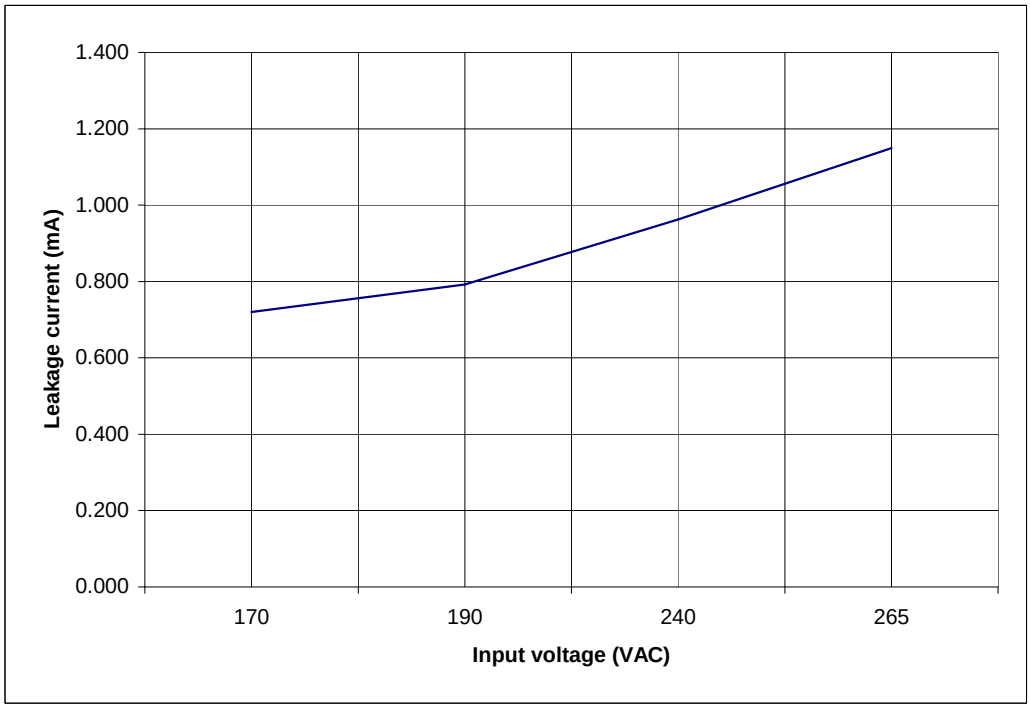
2.13 Leakage current characteristics

Conditions: Ta = 25°C
f=60Hz

1Φ 170-265V (*)



3Φ 170-265V (*)



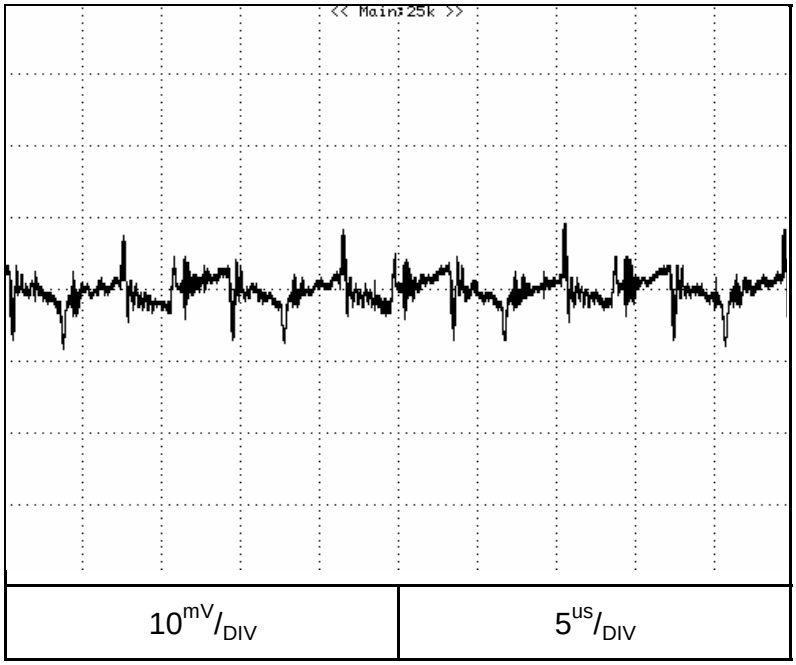
(*) TN & TT power system

2.14 Output ripple & noise waveform
C.V mode

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

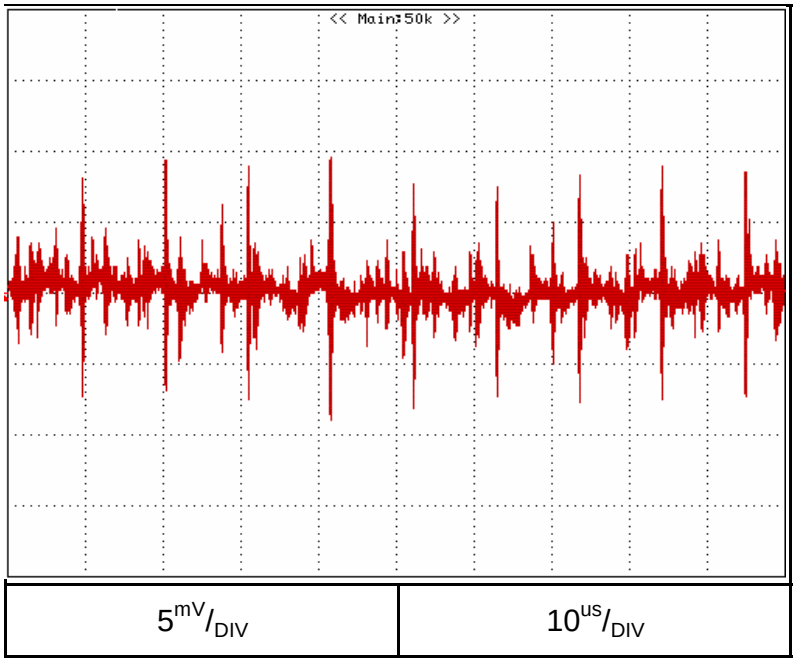
Normal Mode

GEN8-300



$10^{mV}/_{DIV}$	$5^{us}/_{DIV}$

GEN60-40



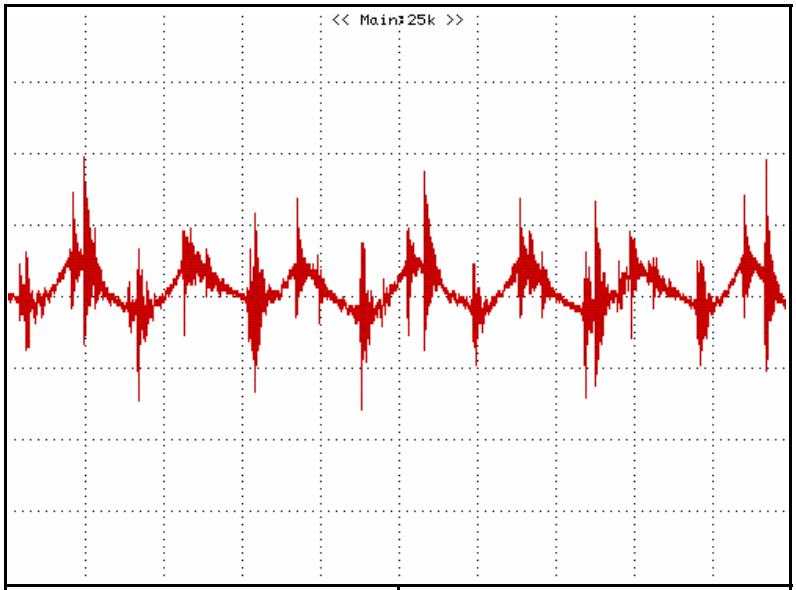
$5^{mV}/_{DIV}$	$10^{us}/_{DIV}$

2.14 Output ripple & noise waveform
C.V mode

Conditions: Vout: 100%
Iout: 100%
Ta = 25℃

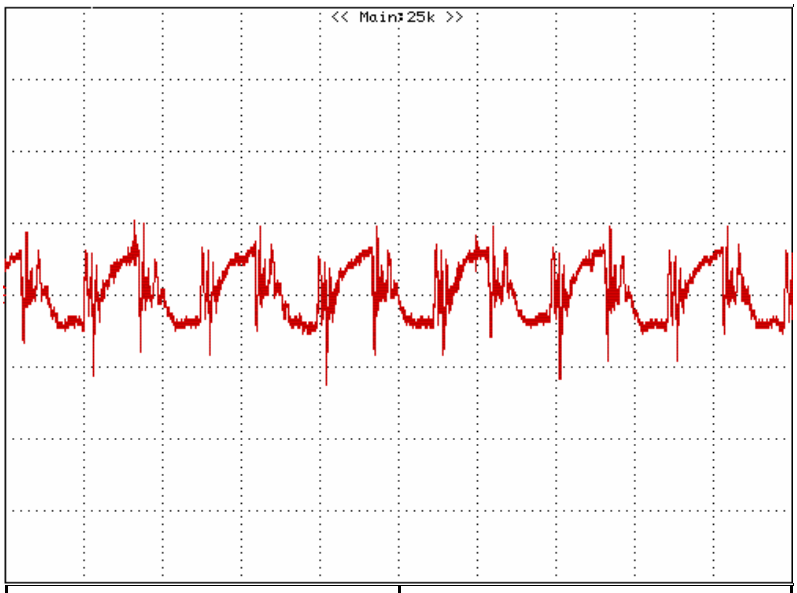
Normal Mode

GEN150-16



$5^{mV}/_{DIV}$	$5^{us}/_{DIV}$

GEN600-4



$20^{mV}/_{DIV}$	$5^{us}/_{DIV}$