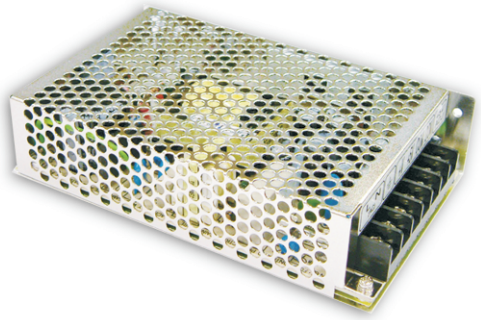
Jameco Part Number 1952433

100W Single Output Switching Power Supply

NES-100 series



■ Features :

- Protections:Short circuit/Over load/Over voltage
- Cooling by free air convection
- LED indicator for power on
- 100% full load burn-in test
- 2 years warranty

SPECIFICATION

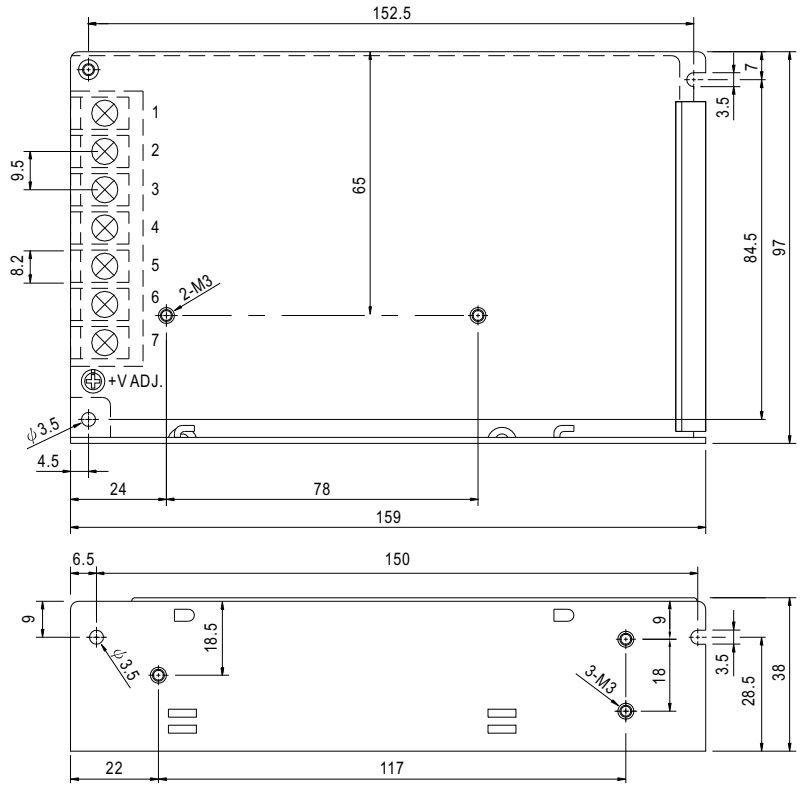
MODEL		NES-100-5	NES-100-7.5	NES-100-9	NES-100-12	NES-100-15	NES-100-24	NES-100-48
OUTPUT	DC VOLTAGE	5V	7.5V	9V	12V	15V	24V	48V
	RATED CURRENT	20A	13.6A	11.2A	8.5A	7A	4.5A	2.3A
	CURRENT RANGE	0 ~ 20A	0 ~ 13.6A	0 ~ 11.2A	0 ~ 8.5A	0 ~ 7A	0 ~ 4.5A	0 ~ 2.3A
	RATED POWER	100W	102W	100.8W	102W	105W	108W	110.4W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	120mVp-p	120mVp-p	120mVp-p	120mVp-p	120mVp-p	150mVp-p
	VOLTAGE ADJ. RANGE	4.75 ~ 5.5V	7.13 ~ 8.3V	8.55 ~ 9.9V	11.4 ~ 13.2V	14.25 ~ 16.5V	22.8 ~ 26.4V	45.6 ~ 52.8V
	VOLTAGE TOLERANCE Note.3	±2.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION Note.4	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION Note.5	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	500ms, 20ms/230VAC 500ms, 20ms/115VAC at full load						
	HOLD TIME (Typ.)	30ms/230VAC 25ms/115VAC at full load						
INPUT	VOLTAGE RANGE	85 ~ 132VAC / 176 ~ 264VAC selected by switch 248 ~ 373VDC						
	FREQUENCY RANGE	47 ~ 63Hz						
	EFFICIENCY (Typ.)	80%	81%	81%	83%	84%	86%	86%
	AC CURRENT (Typ.)	2A/115VAC 1.2A/230VAC						
	INRUSH CURRENT (Typ.)	COLD START 36A						
	LEAKAGE CURRENT	<2mA / 240VAC						
PROTECTION	OVER LOAD	110 ~ 150% rated output power						
		Protection type : Hiccup mode, recovers automatically after fault condition is removed						
	OVER VOLTAGE	5.75 ~ 6.75V	8.6 ~ 10.1V	10.4 ~ 12.2V	13.8 ~ 16.2V	17.25 ~ 20.25V	27.6 ~ 32.4V	55.2 ~ 64.8V
		Protection type : Hiccup mode, recovers automatically after fault condition is removed						
ENVIRONMENT	WORKING TEMP.	-20 ~ +60℃ (Refer to output load derating curve)						
	WORKING HUMIDITY	20 ~ 90% RH non-condensing						
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH						
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)						
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes						
SAFETY & EMC (Note 6)	SAFETY STANDARDS	UL60950-1, CB(IEC60950-1) Approved						
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC						
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC						
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22) Class B						
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3						
	EMS IMMUNITY	Compliance to EN61000-4-2, 3, 4, 5, 6, 8,11, ENV50204, EN55024, EN61000-6-1 Light industry level, criteria A						
OTHERS	MTBF	320.7Khrs min. MIL-HDBK-217F (25℃)						
	DIMENSION	159*97*38mm (L*W*H)						
	PACKING	0.55Kg; 30pcs/17.5Kg/0.97CUFT						

NOTE

1. All parameters not specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. Line regulation is measured from low line to high line at rated load.
5. Load regulation is measured from 0% to 100% rated load.
6. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.

■ Mechanical Specification

Case No. 901 Unit:mm

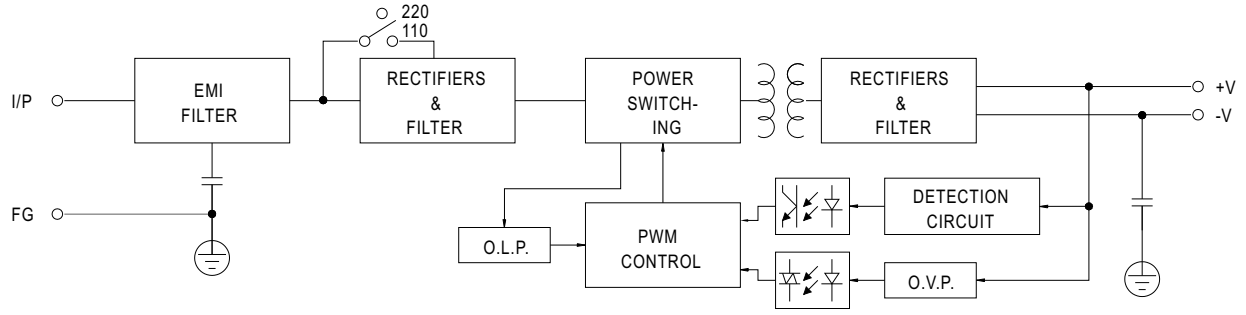


Terminal Pin. No Assignment

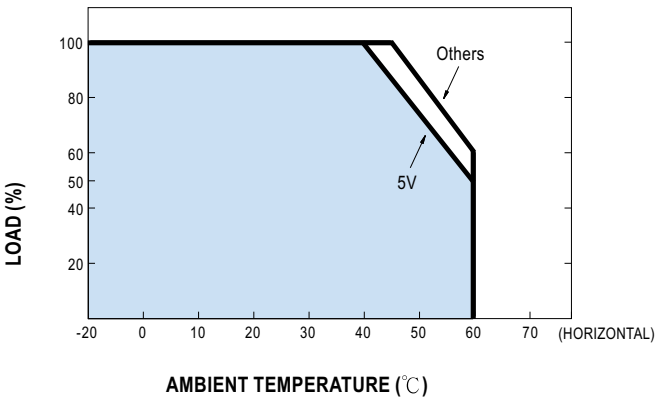
Pin No.	Assignment	Pin No.	Assignment
1	AC/L	4,5	DC OUTPUT -V
2	AC/N	6,7	DC OUTPUT +V
3	FG ⏚		

■ Block Diagram

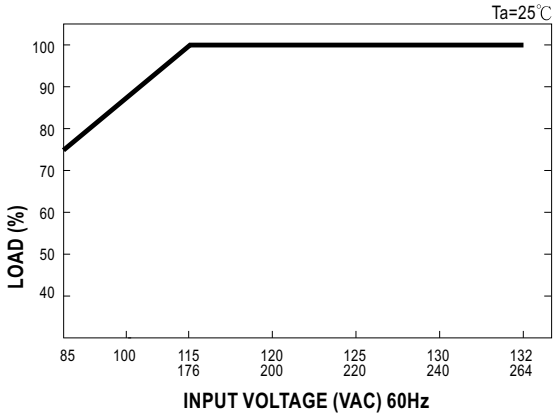
fosc : 60KHz



■ Derating Curve



■ Static Characteristics



MODEL：NES-100-15

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 120 mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	V1: 75 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 14.25 V~ 16.5 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	12.33V~ 17.41 V/ 230VAC 12.33V~ 17.41 V/ 115VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: -1 %~ 1% (Max)	I/P: 176VAC / 264VAC O/P:FULL/ 0 % LOAD Ta:25℃	V1: 0.1 %~ -0.1 %	P
4	LINE REGULATION	V1:-0.5 %~ 0.5 % (Max)	I/P: 176 VAC ~ 264 VAC O/P:FULL LOAD Ta:25℃	V1: 0.04 %~ -0.04 %	P
5	LOAD REGULATION	V1: -0.5 %~0.5 % (Max)	I/P:230 VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: 0.08 %~ -0.08 %	P
6	SET UP TIME	230 VAC/1000ms (Max) 115 VAC/1000 ms (Max)	I/P:230 VAC I/P:115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 256 ms 115VAC/ 256 ms	P
7	RISE TIME	230 VAC/20 ms (Max) 115 VAC/20 ms (Max)	I/P:230 VAC I/P:115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 6 ms 115VAC/ 6 ms	P
8	HOLD UP TIME	230 VAC/ 20 ms (TYP) 115 VAC/ 18 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 33 ms 115VAC/ 29 ms	P
9	OVER/UNDERSHOOT TEST	＜±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: ＜5 %	P
10	DYNAMIC LOAD	V1: 1500 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25℃	252 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	176VAC~ 264 VAC	I/P:TESTING O/P:FULL LOAD Ta:25℃	141 V~ 264 V	P
			I/P: LOW-LINE-3V= 173 V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST: OK	
2	INPUT FREQUENCY RANGE	47 HZ ~ 63 HZ NO DAMAGE OSC	I/P: 176 VAC ~ 264 VAC O/P:FULL~MIN LOAD Ta:25℃	TEST: OK	P
3	EFFICIENCY	84% (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	85 %	P
4	INPUT CURRENT	230 V/ 1.2 A (Max) 115 V/ 2.0\A (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	I = 1 A/ 230 VAC I = 1.76 A/ 115 VAC	P
5	INRUSH CURRENT	230 V/ 40 A (Max) COLD START	I/P:230 VAC O/P:FULL LOAD Ta:25℃	I = 29 A/ 230 VAC	P
6	LEAKAGE CURRENT	< 2 mA / 240 VAC	I/P:254 VAC O/P:Min LOAD Ta:25℃	L-FG: 0.9 mA N-FG: 0.95 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	110 %~ 150 %	I/P: 230 VAC I/P: 115 VAC O/P:TESTING Ta:25℃	123 %/ 230 VAC 122 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 17.25V~ 20.25 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	18.6 V/ 230 VAC 18.6 V/ 115 VAC Shunt down Re-power ON	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P: Full LOAD Ta:25℃	NO DAMAGE Hiccup Mode	P

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECICATION</th><th>TEST CONDITION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： NES-100-24
1. ROOM AMBIENT BURN-IN：1HRS
I/P: 230 VAC O/P: FULL LOAD Ta= 27.5℃
2. HIGH AMBIENT BURN-IN：2 HRS
I/P: 230 VAC O/P: FULL LOAD Ta= 45.4 ℃

<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 27.5℃</th><th>HIGH AMBIENT Ta= 45.4 ℃</th></tr>
<tr><td>1</td><td>BD1</td><td>D3SB60 4A/800V SHI</td><td>74.5℃</td><td>85.9℃</td></tr>
<tr><td>2</td><td>LF1</td><td>TF-479</td><td>70.8℃</td><td>82.3℃</td></tr>
<tr><td>3</td><td>C5</td><td>220U/200V CAPX 85℃</td><td>69.3℃</td><td>78.8℃</td></tr>
<tr><td>4</td><td>RH2</td><td>33KΩ/2W R/MO</td><td>91.9℃</td><td>102.2℃</td></tr>
<tr><td>5</td><td>T1 COIL</td><td>TF-1265</td><td>92.2℃</td><td>102.7℃</td></tr>
<tr><td>6</td><td>D1</td><td>HER208 2A/1KV REC</td><td>82.6℃</td><td>93.4℃</td></tr>
<tr><td>7</td><td>U1</td><td>TL3845P</td><td>76.4℃</td><td>89.1℃</td></tr>
<tr><td>8</td><td>Q1</td><td>K2850 6A/900V FUJI</td><td>69.4℃</td><td>80.9℃</td></tr>
<tr><td>9</td><td>C36</td><td>47U/50V CAPX 105℃</td><td>63.1℃</td><td>76.8℃</td></tr>
<tr><td>10</td><td>D100</td><td>BYQ28X-200 10A/200V PH</td><td>64.4℃</td><td>76.3℃</td></tr>
<tr><td>11</td><td>L100</td><td>TR-405</td><td>70.0℃</td><td>90.2℃</td></tr>
<tr><td>12</td><td>C105</td><td>470U/35V CAPX 105℃</td><td>69.8℃</td><td>81.8℃</td></tr>
<tr><td>13</td><td></td><td></td><td></td><td></td></tr>
<tr><td>14</td><td></td><td></td><td></td><td></td></tr>
<tr><td>15</td><td></td><td></td><td></td><td></td></tr>
</table></td><td>P</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P: 230 VAC
O/P: 120 % LOAD
Ta:25℃</td><td>TEST： OK</td><td>P</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P: 230 VAC
O/P: 100 % LOAD
Ta=-20 ℃</td><td>TEST： OK</td><td>P</td></tr>
<tr><td>4</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 45℃
NO DAMAGE</td><td>I/P: 272 VAC
O/P:FULL LOAD
Ta= 45℃
HUMIDITY= 95 %R.H</td><td>TEST： OK</td><td>P</td></tr>
<tr><td>5</td><td>TEMPERATURE
COEFFICIENT</td><td>± 0.03 %(0~50℃)</td><td>I/P: 230 VAC
O/P:FULL LOAD</td><td>± 0.01 %(0~50℃)</td><td>P</td></tr>
<tr><td>6</td><td>VIBRATION TEST</td><td colspan="2">1 Carton & 1 Set
(1) Waveform: Sine Wave
(2) Frequency:10~500Hz
(3) Sweep Time:10min/sweep cycle
(4) Acceleration:5G
(5) Test Time:1 hour in each axis (X.Y.Z)
(6) Ta:25℃</td><td>TEST： OK</td><td>P</td></tr>
</table>

SAFETY TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3 KVAC/min I/P-FG: 1.5 KVAC/min O/P-FG: 0.5 KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 1.8 KVAC/min O/P-FG: 0.6 KVAC/min Ta:25℃	I/P-O/P: 3.34 mA I/P-FG: 2.57 mA O/P-FG: 2.75 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25℃	I/P-O/P: 30 G Ω I/P-FG: 30 G Ω O/P-FG: 30 G Ω NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25℃	10 mΩ	P
4	APPROVAL	TUV: Certificate NO ： UL: File NO ：E183223			P

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25℃	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25℃	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N :1KV L,N-PE:2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SUPPOSE C 105 IS THE MOST CRITICAL COMPONENT I/P: 230 VAC O/P:FULL LOAD Ta= 25 ℃ LIFE TIME= 81362 HRS I/P: 230 VAC O/P:FULL LOAD Ta= 45 ℃ LIFE TIME= 30600 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 320.7 K HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) **Peak Voltage**	Q1 Rated 2SK2652 : 900 V/ 6 A	I/P:High-Line +3V =267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 716 V (2) 740 V (3) 800 V	P
2	Diode Peak **Voltage**	D100 Rated S20LC20U : 200V / 20A	I/P:High-Line +3V =267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 106 V (2) 124 V (3) 112 V	P
3	Clamp Diode Peak **Voltage**	D1 Rated HER208: 1K V/2 A	I/P:High-Line +3V =267 V O/P: (1)Full Load (2) Dynamic Load 90%Duty/1KHz Ta:25℃	(1) 740 V (2) 740 V	P
4	**Input Capacitor Voltage**	C5 Rated : 220u / 400 V /85℃	I/P:High-Line +3V =267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25℃	(1) 194 V (2) 194 V (3) 194 V	P
5	**Control IC Voltage Test**	U 1 Rated TL3845 : 30 V	I/P:High-Line +3V =267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25℃	(1) 20 V (2) 20 V (3) 20 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2005/2/2	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2005/4/25	PRODUCT SAMPLE	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023