

UNITY DIGITAL
USLF004/008/016/032/064SV+

GENERAL DESCRIPTION

Unity Digital's Flash Memory Card Series SV+ provides high density, high performance nonvolatile read/write solution for secure code storage, disk emulation, mobile PC and embedded applications. One of the key features of this card is that all data stored in the attribute memory is locked. The Series SV+ cards are built with Intel's 32/64/128Mb memory component JS28F320/640/128J3D with the manufacturer/device ID of 89/16_H/17_H/18_H.

FEATURE

- Single Power Supply 3.3 – 5.0 V
- 250ns Maximum Access Time
- Up to 512 Independent Lockable Blocks
- 100,000 Erase Cycles per Block
- Conforms to PCMCIA Release 2.0
- PCMCIA Type II Form Factor

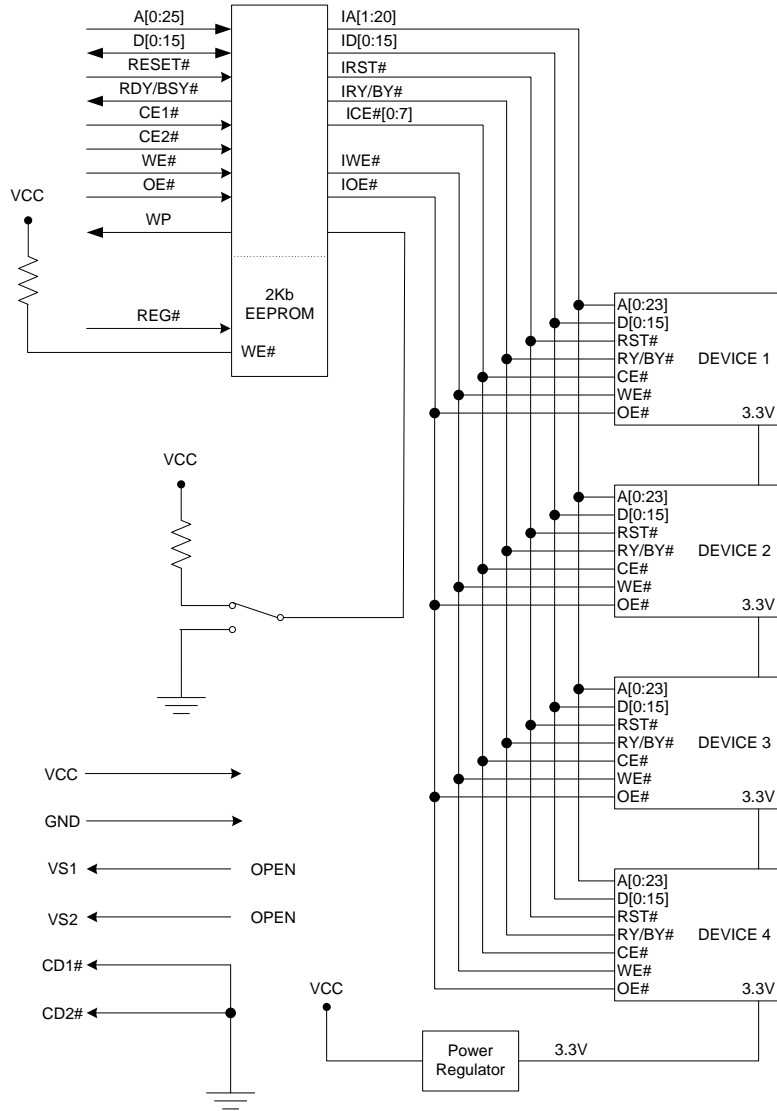
PIN ASSIGNMENT

Pin	Name	Function	Active	Pin	Name	Function	Active
1	GND	Ground		35	GND	Ground	
2	DQ ₃	Data Bit 3		36	CD ₁ #	Card Detect 1	LOW
3	DQ ₄	Data Bit 4		37	DQ ₁₁	Data Bit 11	
4	DQ ₅	Data Bit 5		38	DQ ₁₂	Data Bit 12	
5	DQ ₆	Data Bit 6		39	DQ ₁₃	Data Bit 13	
6	DQ ₇	Data Bit 7		40	DQ ₁₄	Data Bit 14	
7	CE ₁ #	Card Enable 1	LOW	41	DQ ₁₅	Data Bit 15	
8	A ₁₀	Address Bit 10		42	CE ₂ #	Card Enable 2	LOW
9	OE#	Output Enable	LOW	43	VS ₁ #	Voltage Sense 1	
10	A ₁₁	Address Bit 11		44	RFU	Reserved	
11	A ₉	Address Bit 9		45	RFU	Reserved	
12	A ₈	Address Bit 8		46	A ₁₇	Address Bit 17	
13	A ₁₃	Address Bit 13		47	A ₁₈	Address bit 18	
14	A ₁₄	Address Bit 14		48	A ₁₉	Address Bit 19	
15	WE#	Write Enable	LOW	49	A ₂₀	Address Bit 20	
16	RDY/BSY#	Ready Busy	LOW	50	A ₂₁	Address Bit 21	
17	V _{CC}	Supply Voltage		51	V _{CC}	Supply Voltage	
18	V _{PP}	Program Voltage		52	V _{PP}	Program Voltage	
19	A ₁₆	Address Bit 16		53	A ₂₂	Address Bit 22	
20	A ₁₅	Address Bit 15		54	A ₂₃	Address Bit 23	
21	A ₁₂	Address Bit 12		55	A ₂₄	Address Bit 24	
22	A ₇	Address Bit 7		56	A ₂₅	Address Bit 25	
23	A ₆	Address Bit 6		57	VS ₂ #	Voltage Sense 2	
24	A ₅	Address Bit 5		58	RESET	Reset	HIGH
25	A ₄	Address Bit 4		59	RFU	Reserved	
26	A ₃	Address Bit 3		60	RFU	Reserved	
27	A ₂	Address Bit 2		61	REG#	Attribute Memory Select	LOW
28	A ₁	Address Bit 1		62	BVD ₂	Battery Voltage Detect 2	
29	A ₀	Address Bit 0		63	BVD ₁	Battery Voltage Detect 1	
30	DQ ₀	Data Bit 0		64	DQ ₈	Data Bit 8	
31	DQ ₁	Data Bit 1		65	DQ ₉	Data Bit 9	
32	DQ ₂	Data Bit 2		66	DQ ₁₀	Data Bit 10	
33	WP	Write Protect	HIGH	68	CD ₂ #	Card Detect 2	LOW
34	GND	Ground		68	GND	Ground	

SIGNAL DESCRIPTION

Symbol	Type	Name and Function
A ₀ – A ₂₅	INPUT	ADDRESS INPUTS: Address A ₀ through A ₂₅ are address bus lines which enable direct addressing of up to 64 megabytes of memory on the card. Signal A ₀ is not used in word access mode. A ₂₅ is the most significant bit.
DQ ₀ – DQ ₁₅	INPUT/ OUTPUT	DATA INPUT/OUTPUT: DQ ₀ through DQ ₁₅ constitute the bi-directional data bus. DQ ₁₅ is the most significant bit.
CE ₁ # - CE ₂ #	INPUT	CARD ENABLE 1 & 2: CE ₁ # enables even bytes. CE ₂ # enables odd bytes. Multiplexing A ₀ , CE ₁ #, and CE ₂ # allows 8-bit hosts to access all data on D ₀ through D ₇ .
OE#	INPUT	OUTPUT ENABLE: Active low signal gating read data from the memory card.
RDY/BSY#	OUTPUT	READY/BUSY OUTPUT: Indicates status of internally timed erase or write activities. A high output indicates the memory card is ready to accept access. A low output indicates that a device in the memory card is busy with internally timed erase or write activities.
CD ₁ #, CD ₂ #	OUTPUT	CARD DETECT 1 & 2: These signals provide for correct memory card insertion detection. They are positioned at opposite ends of the card to detect proper alignment. The signals are connected to ground internally on the memory card, and will be force low whenever a card is placed in the socket. The host socket interface circuitry shall supply 10K or larger pull-up resistors on these signal pins.
WP	OUTPUT	WRITE PROTECT: Write Protect reflects the status of the Write Protect switch on the memory card. WP set to high = write protected, providing internal hardware write lockout to the flash array.
V _{PP}		WRITE/ERASE POWER SUPPLY:
V _{CC}		CARD POWER SUPPLY:
GND		GROUND: for all internal circuitry
REG#	INPUT	REGISTER SELECT: Provides access to Flash Memory Card register and Card Information Structure in the Attribute memory Plane.
RESET	INPUT	RESET: Active high signal for placing card in Power-On Default State.
BVD ₁ , BVD ₂	OUTPUT	BATTERY VOLTAGE DETECT: These signals are driven high to maintain SRAM card compatibility
VS ₁ , VS ₂	OUTPUT	VOLTAGE SENSE: Notify the host socket of the card's V _{CC} requirements. VS ₁ and VS ₂ open that indicate the available operation voltage is 5V only.
RFU		RESERVE FOR FUTURE USE
N.C.		NO INTERNAL CONNECTION TO CARD: Pin may be driven or left floating.

BLOCK DIAGRAM



FUNCTIONAL TRUE TABLE

COMMON MEMORY								
Mode	REG#	CE ₂ #	CE ₁ #	A ₀	OE#	WE#	D[15:D8]	D[7:0]
Standby	X	H	H	X	X	X	HI-Z	HI-Z
Byte –Read	H	H	L	L	L	H	HI-Z	Even
	H	H	L	H	L	H	HI-Z	Odd
Word-Read	H	L	L	X	L	H	Odd	Even
Byte-Write	H	H	L	L	H	L	X	Even
	H	H	L	H	H	L	X	Odd
Word-Write	H	L	L	X	H	L	Odd	Even
ATTRIBUTE MEMORY								
Mode	REG#	CE ₂ #	CE ₁ #	A ₀	OE#	WE#	D[15:D8]	D[7:0]
Standby	X	H	H	X	X	X	HI-Z	HI-Z
Byte –Read	L	H	L	X	L	H	HI-Z	Even
Word-Read	L	L	L	X	L	H	X	Even
Byte-Write	L	H	L	X	H	L	X	Even
Word-Write	L	L	L	X	H	L	X	Even

Notes: H: High L: Low
X: Don't care HI-Z: High Impedance

For details of information regarding the memory components modes of operation, commands, and programming, please consult the Intel Embedded Flash Memory (J3 v. D) Datasheet.

ABSOLUTE MAXIMUM RATING*

Item	Symbol	Rating	Unit
Voltage on any pin relative to V _{SS}	V _{IN} , V _{OUT}	-0.5 to 6.0	V
Voltage on V _{CC} supply relative to V _{SS}	V _{CC}	-0.5 to 6.0	V
Storage Temperature	T _{stg}	-55 to 150	°C
Power Dissipation	Pd	8	W
Short Circuit Output Current	I _{OS}	50	mA

* Stress greater than those list under “Absolute Maximum Rating” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

RECOMMENDED DC OPERATING CONDITION (Voltage referenced to V_{SS}, T_A = 0 to 70°C)

Item	Symbol	Min	Typ	Max	Unit	Notes
Supply Voltage	V _{CC}	3.0	3.3	5.5	V	
Ground	V _{SS}	0	0	0	V	
Input High Voltage	V _{IH}	2.0	-	V _{CC} + 0.3	V	1
Input Low Voltage	V _{IL}	-0.3	-	0.8	V	2

Notes:
1. V_{CC} + 1.3V at pulse width ≤ 15ns which is measured at V_{CC}.
2. -1.3V at pulse width ≤ 15ns which is measured at V_{SS}.

CIS for Series SV+ Card

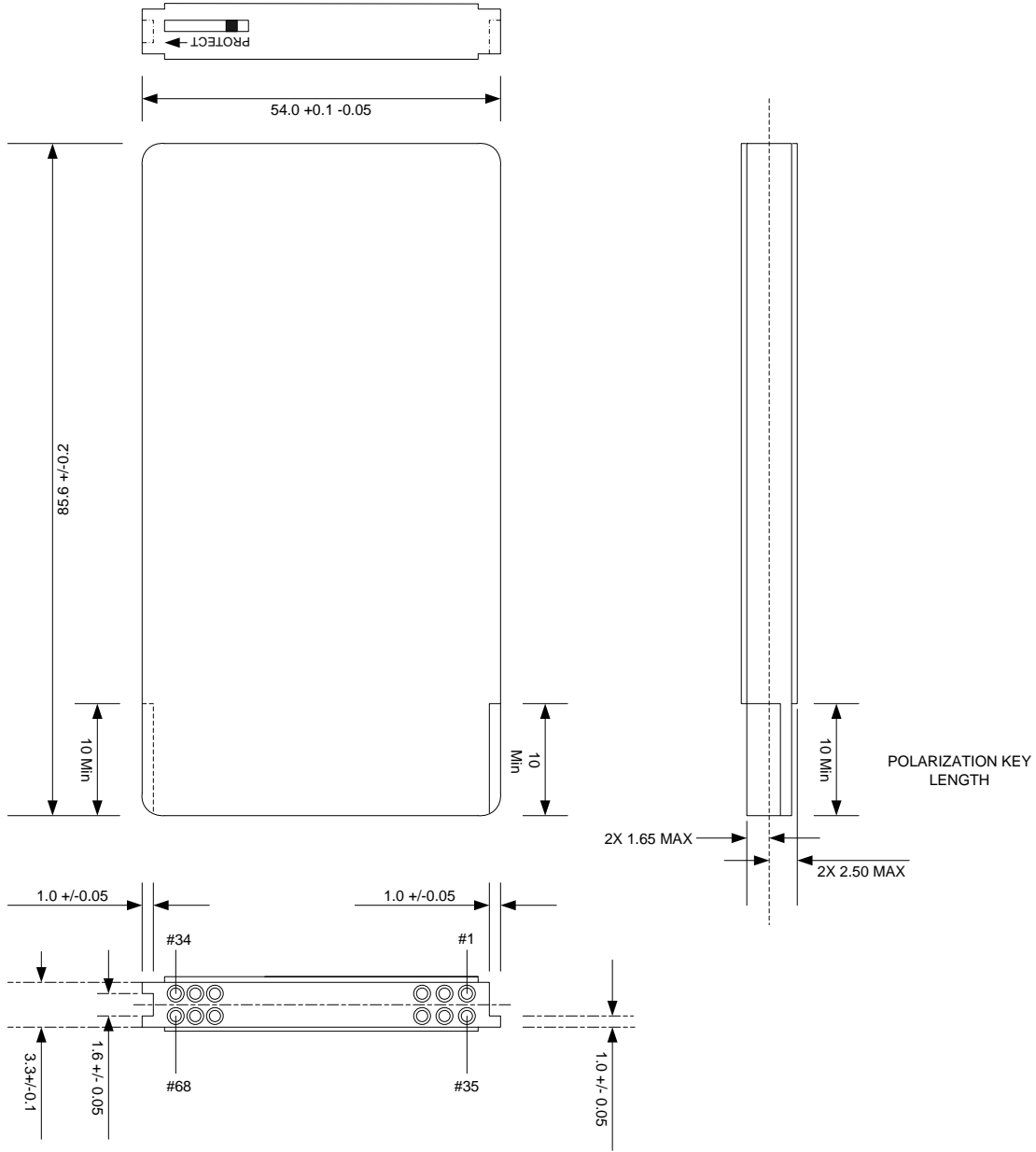
Address	Value	Description
00H	01H	Device Information
02H	03H	Tuple Link
04H	52H	FLASH = 200ns
06H	0EH	CARD SIZE 4MB
	1EH	8MB
	3EH	16MB
	7EH	32MB
08H	FFH	End of Tuple
0AH	18H	JEDEC Code ID
0CH	03H	Tuple Link
0EH	89H	Manufacturer ID
10H	16H	Device ID 32Mb
	17H	64Mb
	18H	128Mb
12H	FFH	End of Tuple
14H	1EH	Device Geometry
16H	07H	Tuple Link
18H	02H	Bus: 2 Bytes
1AH	11H	Erase Block: 64Kbytes
1CH	01H	Read Size: 1 Byte
1EH	01H	Write Size: 1 Byte
20H	01H	Partition: 1 Block
22H	01H	Non-Interleave
24H	FFH	End of Tuple
26H	15H	Version Information
28H	2CH	Tuple Link
2AH	04H	Major Version
2CH	01H	Minor Version
2EH	55H	U
30H	4EH	N
32H	49H	I
34H	54H	T
36H	59H	Y
38H	20H	SPACE
3AH	44H	D
3CH	49H	I
3EH	47H	G

Address	Value	Description
40H	49H	I
42H	54H	T
44H	41H	A
46H	4CH	L
48H	20H	SPACE
4AH	30H	0
	31H	1
	33H	3
4CH	32H	2
	34H	4
	36H	6
	38H	8
4EH	4DH	M
50h	42H	B
52H	20H	SPACE
54H	46H	F
56H	4CH	L
58H	41H	A
5AH	53H	S
5CH	48H	H
5EH	20H	SPACE
60H	43H	C
62H	11H	A
64H	52H	R
66H	44H	D
68H	20H	SPACE
6AH	53H	S
6CH	45H	E
6EH	52H	R
70H	49H	I
72H	45H	E
74H	53H	S
76H	20H	SPACE
78H	53H	S
7AH	56H	V
7CH	2BH	+
7EH	00H	End Text
80H	FFH	End of CIS

ORDERING INFORMATION:

CARD DENSITIES	UNITY DIGITAL PART NO.
4MB	USLF004 SV+
8MB	USLF008 SV+
16MB	USLF016 SV+
32MB	USLF032 SV+

CARD DIMENSION



UNIT: mm