




**SPECIFICATION SHEET**

<b>SPECIFICATION SHEET NO.</b>	N1004- SOT26504TLV05
<b>DATE</b>	Oct. 04, 2021
<b>REVISION</b>	A0
<b>DESCRIPTION</b>	<p>SMD Plastic-Encapsulate ESD Protection Array, SOT-26 series, 6 pads, ESD0504TL Type, Ultra Low Capacitance TVs Diodes</p> <p>Reverse Working Voltage: 5.0V, Clamping Voltage 10VC Max.@1.0A</p> <p>Operating Temp. Range -55°C ~+125°C,</p> <p>Package in Tape/Reel, 3000pcs/Reel</p> <p>RoHS/RoHS III compliant</p>
<b>CUSTOMER</b>	
<b>CUSTOMER PART NUMBER</b>	
<b>CROSS REF. PART NUMBER</b>	
<b>ORIGINAL PART NUMBER</b>	MDD ESD0504TL
<b>PART CODE</b>	SOT26504TLV05

<b>VENDOR APPROVE</b>			
Issued/Checked/Approved			
DATE: Oct. 04, 2021			

<b>CUSTOMER APPROVE</b>	
DATE:	

**SMD ESD PROTECTION ARRAY SOT-26 SERIES**

**MAIN FEATURE**



- Transient protection for high speed data line
- IEC61000-4-2 (ESD) +/-25KV (Air); +/-20KV (Contact)
- IEC61000-4-4 (EFT) 40A (5/50ns)
- Cable dis-charge Event (CDE)
- Package optimized for high-speed line
- Protects four data lines and one Vcc line
- Low capacitance: 0.20pF (I/O to I/O)
- Low clamping voltage
- Low leakage current
- Each I/O pin can withstand over 1000 ESD strikes for +/-8.0KV contact discharge

**APPLICATION**

- Serial ATA
- High definition multi interface (HDMI)
- MDDI ports
- USB 2.0/3.0 power and data line protection
- Display ports
- Digital visual interfaces (DVI)

**PART CODE GUIDE**

**RFQ**  
Request For Quotation

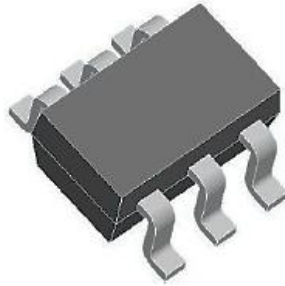
SOT26	504TL	S	V05
1	2	3	4

- 1) **SOT26**: SMD ESD Protection Array SOT-26 Series, 6 Pads
- 2) **504TL**: Type code for original part number ESD0504TL
- 3) **S**: Package code, Package in Tape/Reel, 3000pcs/Reel
- 4) **V05**: Marking code for “V05” on the case surface, Different Marking for different specification.

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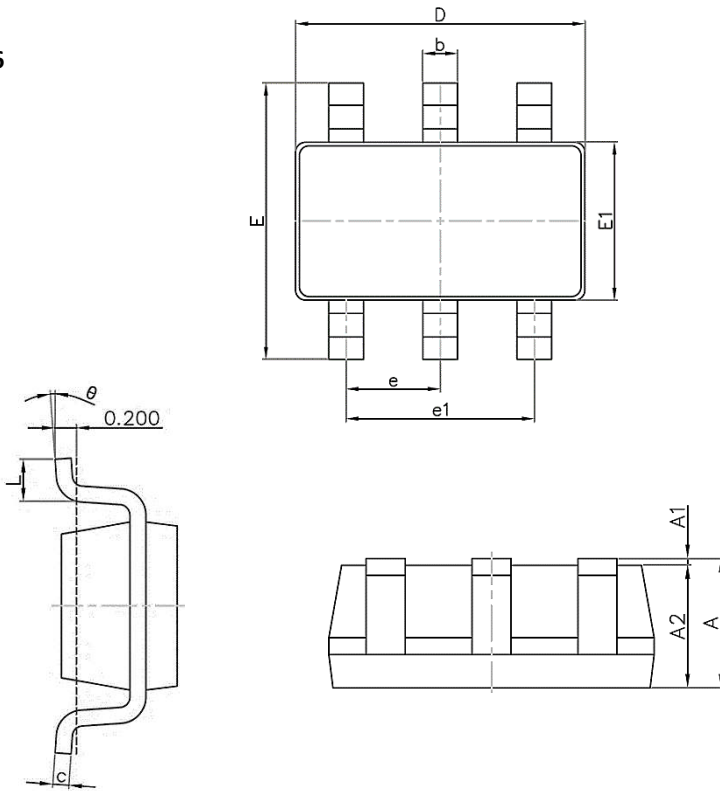
**DIMENSION (Unit: Inch/mm)**

Image for reference



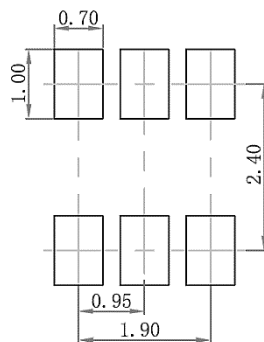
Marking: V05

SOT-26

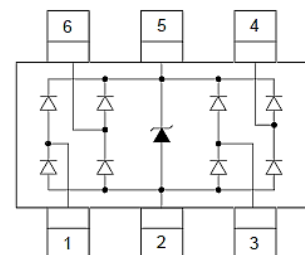


Symbol	Value ( mm )		
	Min.	Typ.	Max.
A	1.05		1.25
A1	0		0.10
A2	1.05		1.15
b	0.30		0.50
c	0.10		0.20
D	2.82		3.02
E1	1.50		1.70
E	2.65		2.95
e	0.95		
e1	1.8		2.0
L	0.3		0.06
$\theta$	0°		8°

**Recommend Pad Layout**



**Circuit Diagram**



Note: I/O pins: Pin 1,3,4,6; Pin 5: Vcc; Pin 2: GND

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**MECHANICAL DATA**

Case	Flammability Rating	Polarity	Mounting Position	Weight per piece
JEDEC SOT-26 molded plastic body	UL 94V-0	-	-	-

**ABSOLUTE MAX. RATINGS AT Ta=25 °C (unless otherwise specified)**

Parameter	SYMBOLS	VALUE	UNITS
		LIMIT	
ESD per IEC 61000-4-2 (Air)	V ESD	+/-25	KV
ESD per IEC 61000-4-2 (Contact)	V ESD	+/-20	KV
Peak Pulse Power (8/20µs)	P PP	60	W
Operating Temperature Range	T J	-55 ~+ 125	°C
Storage Temperature Range	T STG	-55 ~ +150	°C
Lead Solder Temperature- Max. (10 s Duration)	T L	260 /10s	°C

**SMD ESD PROTECTION ARRAY SOT-26 SERIES**
**ELECTRICAL CHARACTERISTICS ( Ta=25 °C unless otherwise specified)**

Parameter		SYMBOLS	VALUE			UNITS
			Min.	Typical	Max.	
<b>Reverse Working Voltage</b> @ Any I/O pin to GND		V <sub>RWM</sub>			5.0	V
<b>Reverse Breakdown Voltage</b> @ I <sub>T</sub> = 1.0mA, Any I/O pin to GND		V <sub>BR</sub>	6.0		9.0	V
<b>Reverse Leakage Current</b> @V <sub>RWM</sub> = 5.0V, Any I/O pin to GND		I <sub>R</sub>			1.0	μA
<b>Clamping Voltage</b>	@ I <sub>PP</sub> = 1.0A, t <sub>p</sub> = 8/20μs Any I/O pin to GND	V <sub>C</sub>			10	V
	@ I <sub>PP</sub> = 4.0A, t <sub>p</sub> = 8/20μs Any I/O pin to GND				10	V
	@ I <sub>PP</sub> = 8.0A, t <sub>p</sub> = 8/20μs V <sub>cc</sub> pin to GND				15	V
<b>Parasitic Capacitance</b>	@V <sub>R</sub> =0V, f=1MHz Between I/O and I/O	C <sub>ESD</sub>		0.20	0.3	pF
	@V <sub>R</sub> =0V, f=1MHz Between I/O and GND			0.45	0.50	pF
	@V <sub>R</sub> =0V, f=1MHz Between V <sub>cc</sub> and GND			0.80		pF

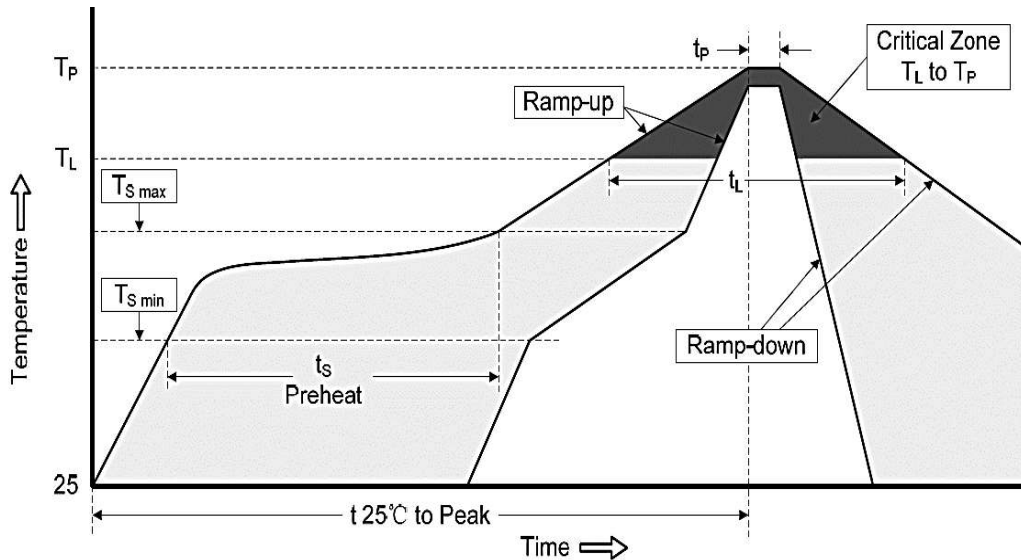
Note: I/O pins are Pin 1,3,4,6; Pin 5: V<sub>cc</sub>; Pin 2: GND

**SMD ESD PROTECTION ARRAY SOT-26 SERIES**
**RELIABILITY**

Number	Experiment Items	Experiment Method And Conditions	Reference Documents
1	Solder Resistance Test	Test 260°C± 5°C for 10 ± 2 sec. Immerse body into solder 1/16" ± 1/32"	MIL-STD-750D METHOD-2031.2
2	Solderability Test	230°C ±5°C for 5 sec.	MIL-STD-750D METHOD-2026.1 0
3	Pull Test	1 kg in axial lead direction for 10 sec.	MIL-STD-750D METHOD-2036.4
4	Bend Test	0.5Kg Weight Applied To Each Lead, Bending Arcs 90 °C ± 5 °C For 3 Times	MIL-STD-750D METHOD-2036.4
5	High Temperature Reverse Bias Test	TA=100°C for 1000 Hours at VR=80% Rated VR	MIL-STD-750D METHOD-1038.4
6	Forward Operation Life Test	TA=25°C Rated Average Rectified Current	MIL-STD-750D METHOD-1027.3
7	Intermittent Operation Life Test	On state: 5 min with rated IRMS Power Off state: 5 min with Cool Forced Air. On and off for 1000 cycles.	MIL-STD-750D METHOD-1036.3
8	Pressure Cooker Test	15 PSIG, TA=121°C, 4 hours	MIL-S-19500 APPENOIXC
9	Temperature Cycling Test	-55°C~+125°C; 30 Minutes For Dwelled Time 5 minutes for transferred time. Total: 10 cycles.	MIL-STD-750D METHOD-1051.7
10	Thermal Shock Test	0°C for 5 minutes., 100°C for 5minutes, Total: 10 cycles	MIL-STD-750D METHOD-1056.7
11	Forward Surge Test	8.3ms Single Sale Sine-wave One Surge.	MIL-STD-750D METHOD-4066.4
12	Humidity Test	TA=65°C, RH=98% for 1000 hours.	MIL-STD-750D METHOD-1021.3
13	High Temperature Storage life Test	150°C for 1000 Hours	MIL-STD-750D METHOD-1031.5

**SMD ESD PROTECTION ARRAY SOT-26 SERIES**

**SUGGESTED REFLOW PROFILE (For Reference Only)**

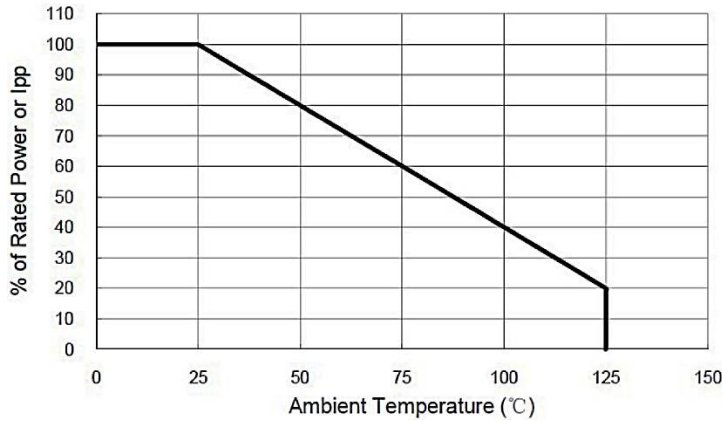


<b>Profile Feature</b>		Pb-Free Assembly
<b>Average Ramp-up Rate (Ts Max to Tp)</b>		3°C/second Max
<b>Preheat</b>	<b>Temperature Min (Ts Min.)</b>	150°C
	<b>Temperature Max (Ts Max.)</b>	200°C
	<b>Time (ts Min. to ts Max.)</b>	60 ~ 180 seconds
<b>Time maintained above</b>	<b>Temperature (Tl)</b>	217°C
	<b>Time (ti)</b>	60 ~ 150 seconds
<b>Peak/Classification Temperature (Tp)</b>		260 °C
<b>Time within 5°C of actual Peak Temperature (tp)</b>		20 ~ 40 seconds
<b>Ramp-down rate</b>		6 °C /Second Max.
<b>Time 25 °C to Peak Temperature</b>		8 minutes Max.
<b>Suggest reflow times</b>		3 Times Max.

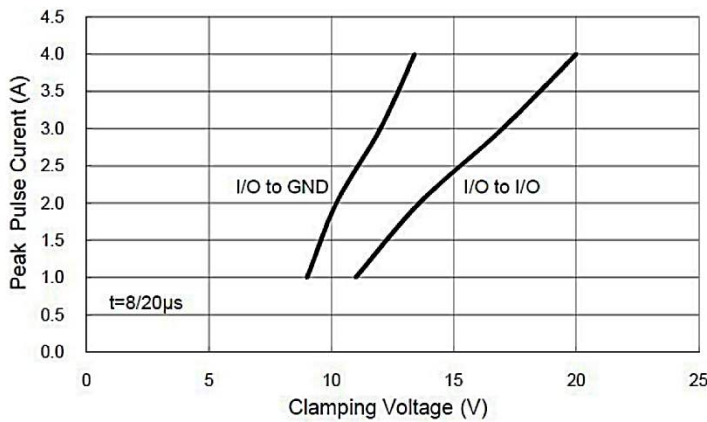
**SMD ESD PROTECTION ARRAY SOT-26 SERIES**

**RATINGS AND CHARACTERISTIC CURVES (For Reference Only)**

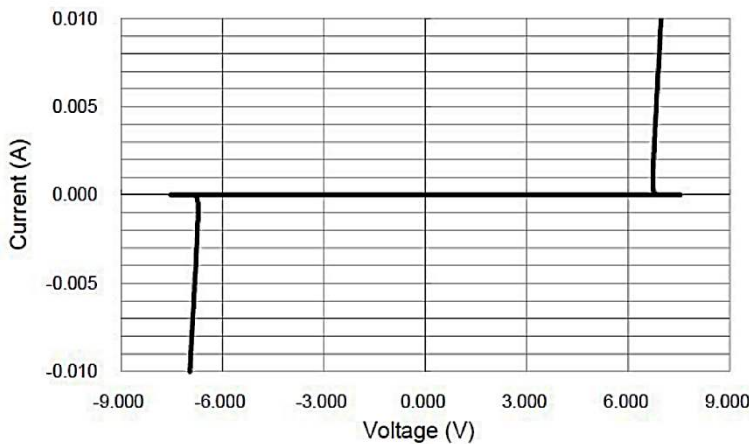
**Fig 1 Power Derating Curve**



**Fig 2 Clamping Voltage vs Peak Pulse Current**



**Fig 3 Voltage Sweeping of I/O to I/O**

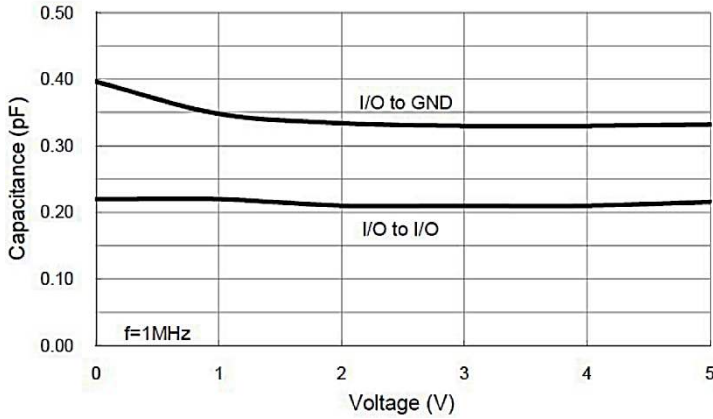




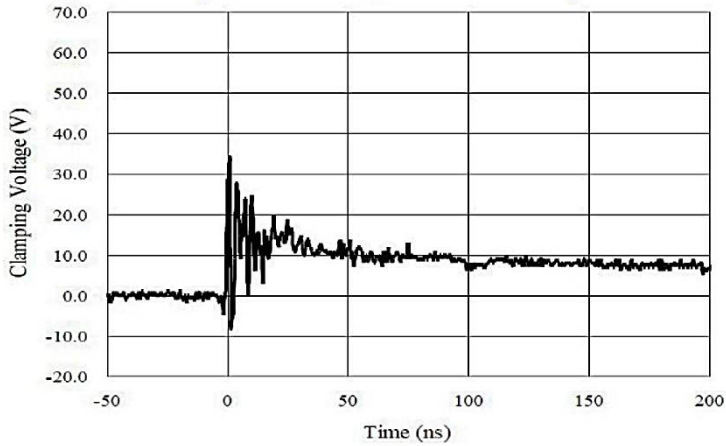
**SMD ESD PROTECTION ARRAY SOT-26 SERIES**

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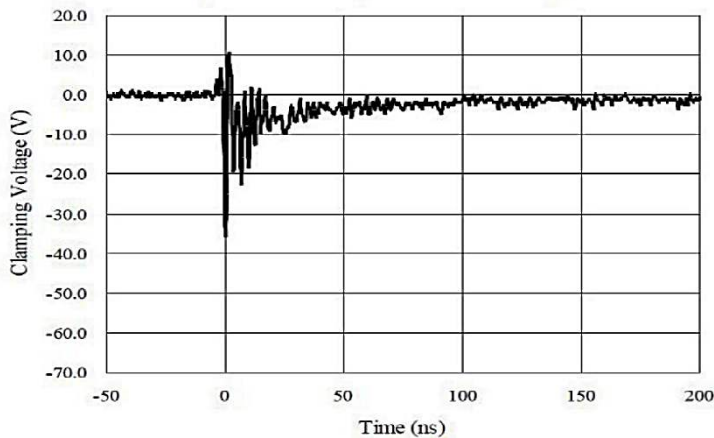
**Fig 4 Voltage vs Capacitance**



**Fig 5 ESD Clamping of I/O to GND (+8kV Contact per IEC 61000-4-2)**



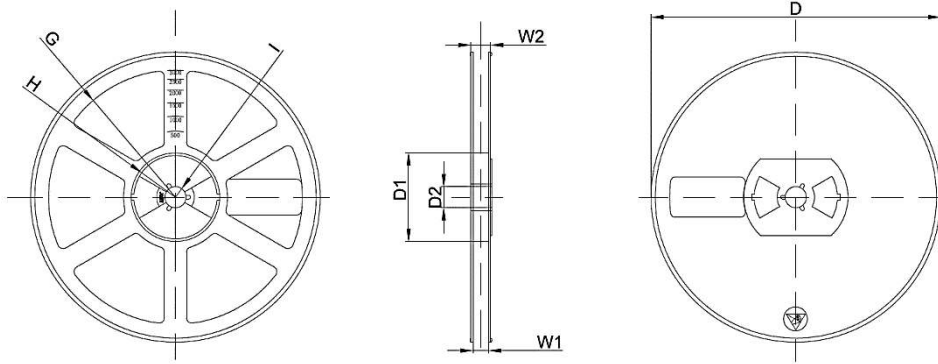
**Fig 6 ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)**



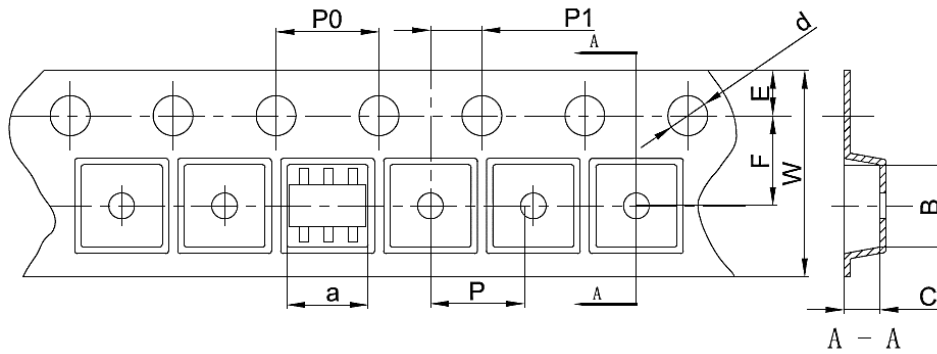
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**TAPE/REEL (Unit: mm)**

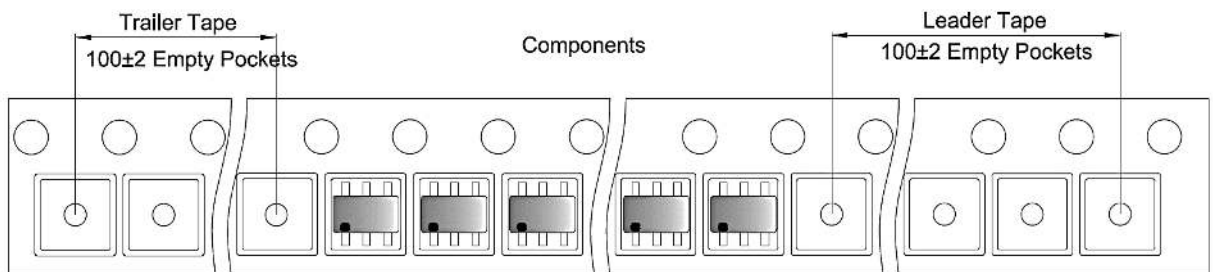
All Devices are packed in accordance with EIA standard RS-481-A and specifications.



D	D 1	D 2	G	H	I	W 1	W 2
Ø180.00	60.0	13.0	R78.0	R25.60	R6.5	9.5	13.10



a	B	C	d	E	F	P 0	P	P 1	W
3.17	3.23	1.37	Ø1.55	1.75	3.50	4.00	4.00	2.00	8.00



**SMD ESD PROTECTION ARRAY SOT-26 SERIES**

**SPQ PACKAGE for Reference**

Item	Unit	Value
Case Code		SOT-26
Reel Size	Inch	7
Reel Size	mm	178
Tape Space	mm	/
SPQ /Reel	pcs	3000
Weigh /SPQ	LBS	
Weigh /SPQ	KGs	
Qty. Per Box	pcs	6,000
Inner Box	Inch	L8.0*W8.0*H1.5

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