

Operating Temperature : -55°C to + 125°C

Storage Temperature : -55°C to + 150°C

Packaging Method : Tape & Reel(per Specifications)

Features:

Full compliance on :

IEC 61000-4-2 (ESD) ±15kV (air) ± 8kV (contact)

IEC 61000-4-4 (EFT) 40A 5/50ns

IEC 61000-4-5(Lightning) 8/20µs

Low voltage operation : first in the industry with the 1.2-1.5V operating level ESD Protection.

Off-State Capacitance as low as 1.0 Pf Broad micro-packaging platform options (leaded or leadless) offering flexibility to customer with general and custom needs High level of integration and functionality All products are RoHS directive compliant

Part Number Code

N **05** **1** **AD** **52**

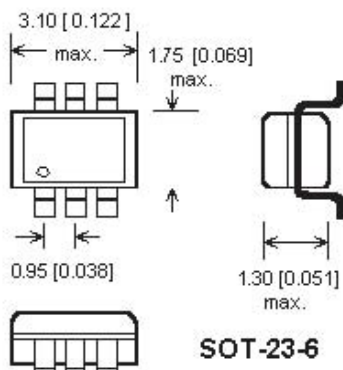
(1) (2) (3) (4) (5)

- (1)N: Normal
- (2)05: 5V
- (3)1: 1-Line
- (4)AD: SOD
- (5)52: SOD-523

ELECTRICAL CHARACTERISTICS

Rated at 25°C ambient temperature unless otherwise specified.

Characteristics	Symbol	Minimum	Typical	Maximum	Unit
Reverse Stand-off Voltage	V _{RWM}			5	V
Reverse Breakdown Voltage (I _r =mA)	V _{BR}	6			V
Reverse Leakage Current (V _{RWM} =5V, T=25°C)	I _R			5	µA
Forward Voltage (I _F =10mA)	V _F		0.8		V
Clamping Voltage (I _{pp} =5A, t _p =8/20µs)	V _C			9.5	V
Clamping Voltage (I _{pp} =16A, t _p =8/20µs)	V _C			12.5	V
Junction Capacitance (V _R =0V, f=1MHz)	C _i			150	pF



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APPLICATION

General-purpose downstream ESD protection high frequency analog signals and high-speed serial data transmission for ports inside : ※PC-/Notebook USB2.0/IEEE1394 Ports ※Cellular phone and PCS mobile handsets ※DVI interfaces ※Cordless telephones ※ Wireless data (WAN/LAN) systems ※PDAs

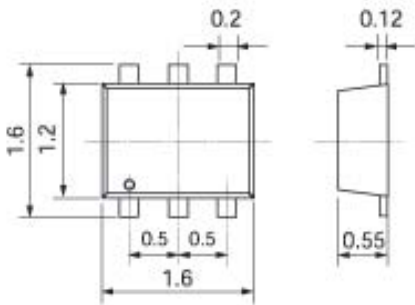
Part Number Code

- L 05 4 BT 2 6
 (1) (2) (3) (4) (5) (6)
 (1)L: Low pF
 (2)05: 5V
 (3)4: 4-Line
 (4)BT:
 (5)2: USB
 (6)6: 6 pin

ELECTRICAL CHARACTERISTICS T_c=25°C unless otherwise specified

PARAMETER	TEST CONDITIONS	SUMBO	MIN	TYP	MAX	UNIT
Pin capacitance to ground, Pins 1,3,4,6	Vdc = 0V ; f = 1MHz Pin 5 = + 3.0V	C _{vo}	-	1.0	-	pF
Diode reverse leakage current, Pins 1,3,4,6 to ground	V = +3.0V	I _{lkg}	-	-	100	nA
Zener diode capacitance to ground, Pin 5 to 2	Vdc = 0V ; f = 1MHz Pin 5 = + 3.0V	C _{zener}	-	40	-	pF
Zener diode breakdown voltage, Pin 5 to 2	I=1mA	V _{BRVO}	6	-	9	V
Forward voltage		V _F	-	0.7	-	V

SOT-563



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APPLICATION

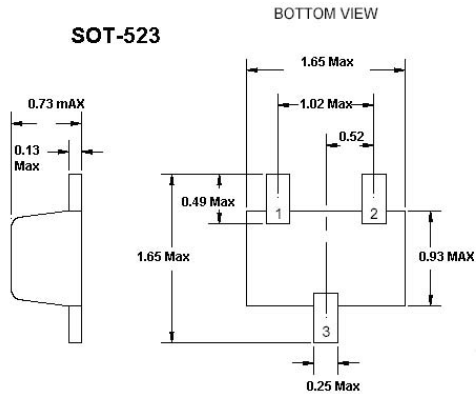
※Cordless phones ※Cellular phones & accessories ※Audio/Video inputs ※Portable electronics (Digital Cameras, MP3 Players, ect.) ※Networks

Part Number Code

- N 05 5 AT 56
 (1) (2) (3) (4) (5)
 (1)N: Normal
 (2)05: 5V
 (3)5: 5-Line
 (4)AT: SOT
 (5)56: 563-6

ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Reverse Breakdown Voltage	V_{BR}	$I_t=1mA$	6.15	6.5	7.15	V
Clamping Voltage	V_C	$I_{PP}=1A$	-	-	9	V
Maximum Peak Pulse Current	I_{PP}	$t_p= 8/20\mu s$	-	-	3.5	A
Reverse Leakage Current	I_R	$V_{RVM} = 5V$	-	10	35	µA
Diode Capacitance	C_D	$V_R = 0V, f = 1MHz$	-	22	28	pF
Differential Resistance	r_{diff}	$I_r=1mA$		20	100	Ohms



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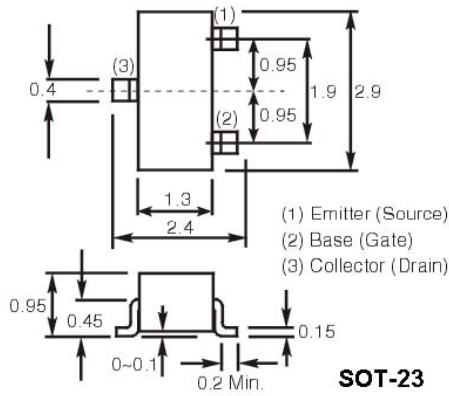
Part Number Code

UL 05 2 AT 52
 (1) (2) (3) (4) (5)

- (1)UL: Ulira low
- (2)05: 5V
- (3)2: 2-Line
- (4)AT: SOT
- (5)52: SOT-523

ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zener Voltage	V_Z	$I_Z = 5mA$	5.4	-	5.75	V
Reverse Current	I_R	$V_R = 2.5V$	-	-	1.00	µA
Operating Resistance	Z_Z	$I_Z = 5mA$	-	-	60	Ω
Rising Operating Resistance	Z_{ZK}	$I_Z = 0.5mA$	-	-	200	Ω
Capactiance Between Terminals	C_T	$f = 1MHz, V_R = 5V$	-	4	-	pF



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APPLICATION

※RS-232,RS-423 data lines ※Cellular phone terminals ※Audio/Video inputs ※Portable electronics ※Networks

Part Number Code

N 05 2 AT 23
 (1) (2) (3) (4) (5)

(1) N: Normal (2) 05: 5V
 (3) 2: 2-Line (4) AT: SOT
 (5) 23: SOT-23

ELECTRICAL CHARACTERISTICS

PART NUMBER	MARKING CODE	REVERSE STAND-OFF VOLTAGE	Min V _{BR} @ 1mA	Max. Clamping @ I _{PP} = 1A	Max Peak Pulse Current _z	Leakage Current @ V _{RWM}	Capacitance @ 0V, 1MHz Pin 1-2	Capacitance @0V, 1MHz Pin 1-3 & 2-3
		V _{RWM}	BV(min)	V _C (typ.)	I _{PP}	I _R	C _j (max.)	C _j
		Volts	Volts	Volts	Amps	µA	pF	pF
ND02AT23	T5	5	6	9.5	17	20	250	300

DM Series

DEVICE RATINGS AND SPECIFICATIONS

Part Number	Allowable Continuous Working Voltage	Breakdown Voltage @ 1 mA (DC) Test Current	Max. Clamping Voltage At Specified Current (8/20µs)	Typical Capacitance @ 1 MHz	Typical Inductance
	$V_{M(DC)}$	$V_{N(DC)}$	V_c	C	L
	(V)	(V)	(V)	(pF)	(nH)
EPD02S3R3DM271PT	3.3V	4.5~6.0V	9.5V@1A	250~300	0.8
EPD02S5R5DM301PT	5.5V	7.8~9.8V	15.0V@1A	280~330	0.8
EPD02S120DM191PT	12.0V	15.0~18.0V	24.0V@1A	170~210	0.8
EPD03S5R5DM651PT	5.5V	7.8~9.8V	15.0V@1A	570~710	1.0
EPD03S120DM311PT	12.0V	15.0~18.0V	24.0V@1A	270~330	1.0

N Series

DEVICE RATINGS AND SPECIFICATIONS

Part Number	Allowable Continuous Working Voltage	Breakdown Voltage @ 1 mA (DC) Test Current	Max. Clamping Voltage At Specified Current (8/20µs)	Typical Capacitance @ 1 MHz	Typical Inductance
	$V_{M(DC)}$	$V_{N(DC)}$	V_c	C	L
	(V)	(V)	(V)	(pF)	(nH)
EPD02S030N271PT	3.3V	4.5~6.0V	10.5V@1A	250~300	0.8
EPD02S050N161PT	5.5V	8.0~11.0V	19.0V@1A	140~180	0.8
EPD02S120N121PT	12.0V	16.0~19.0V	27.5V@1A	100~140	0.8
EPD02S180N850PT	18.0V	23.0~28.0V	40.5V@1A	80~120	0.8
EPD03S030N701PT	3.3V	4.5~6.0V	10.5V@1A	630~770	1.0
EPD03S050N651PT	5.5V	8.0~11.0V	17.0V@1A	570~710	1.0
EPD03S120N311PT	12.0V	16.0~19.0V	27.5V@1A	270~330	1.0
EPD03S180N231PT	18.0V	23.0~28.0V	40.5V@1A	200~250	1.0

H Series

DEVICE RATINGS AND SPECIFICATIONS

Part Number	Allowable Continuous Working Voltage	Breakdown Voltage @ 1 mA (DC) Test Current	Max. Clamping Voltage At Specified Current (8/20µs)	Typical Capacitance @ 1 MHz	Typical Inductance
	$V_{M(DC)}$	$V_{N(DC)}$	V_c	C	L
	(V)	(V)	(V)	(pF)	(nH)
EPD02S180H300PT	2~18	22~32	50V@1A	30	0.8
EPD02S180H200PT	2~18	22~32	50V@1A	20	0.8
EPD02S180H100PT	2~18	22~32	55V@1A	10	0.8
EPD02S180H050PT	2~18	45~60	100V@1A	5	0.8
EPD02S180H020PT	2~18	320~360	520V@1A	2	0.8
EPD03S180H300PT	2~18	22~32	50V@1A	30	1.0
EPD03S180H200PT	2~18	22~32	50V@1A	20	1.0
EPD03S180H100PT	2~18	22~32	55V@1A	10	1.0
EPD03S180H050PT	2~18	45~60	100V@1A	5	1.0
EPD03S180H020PT	2~18	360~400	580V@1A	2	1.0