

# MPD Tech Note

## MICROPOWER DIRECT

# Acronyms, Abbreviations & Symbols



MicroPower Direct

MPD, a leading worldwide provider of power conversion products, was founded by a group of industry veterans in 1999. Located in Stoughton, MA, we are committed to delivering innovative, high quality power converters at the lowest possible prices.

We currently offer over 5,000 low cost standard "off-the-shelf" high performance power converters. Our product lines include DC/DC converters, AC/DC power supplies, high brightness LED drivers, IGBT drivers & controllers, and switching POL regulators.

Component selection and layout are carefully considered at the design stage to optimize product reliability. All manufacturing is in ISO9000 registered factories under strict quality control system guidelines. All products are supported worldwide, and carry a standard three year warranty.

MPD power products have been designed into a wide variety of products and systems by a very diverse customer base. End products range from computer peripherals to test instrumentation to telecommunications equipment to process/industrial controls to medical devices and more.

### — A —

#### A

- Symbol for:
  - ampere
  - amplitude
  - anode
  - area (m<sup>2</sup>)
  - current density (linear A/m)

#### a

- Symbol for:
  - atto (quintillionth), 10<sup>-18</sup>
  - acceleration (m/s<sup>2</sup>)

#### a

- Subscript for:
  - alternating
  - axial
  - absolute
  - anode

#### AC (ac)

- Abbreviation of:
  - alternating current
  - activated carbon

#### AEA

- Abbreviation of:
  - American Engineering Association
  - American Electronic Association

#### AF

- Abbreviation of:
  - audio frequency

#### AFE

- Abbreviation of:
  - analog front end

#### AFC

- Abbreviation of:
  - automatic frequency control

#### AGC

- Abbreviation of:
  - automatic gain control

#### Ah

- Abbreviation of:
  - ampere hour (amp hr also used)

#### AI

- Abbreviation of:
  - artificial intelligence

#### AIEE

- Abbreviation of:
  - American Institute of Electrical Engineers

#### ALVT

- Abbreviation of:
  - advanced low voltage technology

#### AM

- Abbreviation of:
  - amplitude modulation

#### amb

- Subscript for:
  - ambient

#### amp

- Abbreviation of:
  - ampere

#### AMT

- Abbreviation of:
  - advanced manufacturing technology

#### ANSI

- Abbreviation of:
  - American National Standards Institute

#### APEC

- Abbreviation of:
  - advanced process equipment control

#### APM

- Abbreviation of:
  - advanced power management

#### AQL

- Abbreviation of:
  - acceptable quality level

#### as

- Subscript for:
  - asynchronous

#### ASCII

- Abbreviation of:
  - American Standard Code for Information Interchange

#### ASIC

- Abbreviation of:
  - all purpose symbolic instruction code application specific integrated circuit

#### ASME

- Abbreviation of:
  - American Society of Mechanical Engineers

#### ASQ

- Abbreviation of:
  - American Society for Quality

#### ASSP

- Abbreviation of:
  - application specific standard product

## ASTM

- Abbreviation of:
  - American Society for Testing and Materials

## AT

- Abbreviation of:
  - ampere turn

## ATC

- Abbreviation of:
  - automatic temperature control

## ATE

- Abbreviation of:
  - automatic test equipment

## ATG

- Abbreviation of:
  - automatic test generation

## atm

- Symbol for:
  - Atmosphere (1 atm = 101.325 kPa)

## av

- Subscript for:
  - average

## AWG

- Abbreviation of:
  - American wire gauge
  - arbitrary waveform generator

# — B —

## B

- Symbol For:
  - susceptance (Siemens)
  - magnetic field (Tesla's)
  - bel (10 dB)
  - base (of a transistor)
  - byte
  - bandwidth

## B

- Symbol For:
  - susceptance (Siemens)

## b

- Symbol For:
  - bit

## b

- Subscript for:
  - base

## BABT

- Abbreviation of:
  - British Approvals Board for Telecommunications

## BBM

- Abbreviation of:
  - break-before-make

## BCD

- Abbreviation of:
  - binary coded decimal

## BCI

- Abbreviation of:
  - Battery Council International

## Bd

- Symbol for:
  - baud

## BGA

- Abbreviation of:
  - ball grid array

## BI

- Abbreviation of:
  - backplane interconnect
  - bus interconnect
  - burn in

## BIPM

- Abbreviation of:
  - Bureau International des Poids et Mesures (International Bureau of Weights and Measures)

## br

- Subscript for:
  - breakdown

## BSI

- Abbreviation of:
  - British Standards Institute

## BTU

- Abbreviation of:
  - British thermal unit

## BV

- Abbreviation of:
  - breakdown voltage

## BW

- Abbreviation of:
  - bandwidth

# — C —

## C

- Symbol for:
  - coulomb
  - capacitance (Farads)
  - collector (of a transistor)
  - Celsius
  - heat capacity (J°C<sup>-1</sup>)

## c

- Symbol for:
  - centi (hundreth), 10<sup>-2</sup>

## c

- Symbol for:
  - speed of light in a vacuum (m/s)
  - speed of sound (m/s)

- Subscript for:

- case
- collector
- cathode

## CAD

- Abbreviation of:
  - computer aided design

## Cal

- Symbol for:
  - calorie (large - kilogram calorie)

## cal

- Symbol for:
  - calorie (small - gram calorie)

## CAM

- Abbreviation of:
  - computer aided manufacturing

## CAT

- Abbreviation of:
  - computer aided test

## CB

- Abbreviation of:
  - circuit breaker

## CC

- Abbreviation of:
  - constant current

## cd

- Symbol For:
  - candela (luminous intensity)

## CE

- Abbreviation of:
  - Certified Europe

## CEI

- Abbreviation of:
  - conducted electromagnetic interference

## CEN

- Abbreviation of:
  - Comité Européen de Normalisation (European Committee for Standardization)

## CFA

- Abbreviation of:
  - component failure analysis

## CID

- Abbreviation of:
  - computer integrated design

## CIE

- Abbreviation of:
  - computer integrated engineering

## CIM

- Abbreviation of:
  - computer integrated manufacturing

## CIP

- Abbreviation of:
  - continuous improvement program

## CIPM

- Abbreviation of:
  - Comité International des Poids et Mesures (International Bureau of Weights and Measures)

## CISPR

- Abbreviation of:
  - Comité International Spécial des Perturbations Radioélectriques (International special committee on Radio Interference)

## CISTI

- Abbreviation of:
  - Canadian Institute for Scientific and Technical Information

## Cm

- Abbreviation of:
  - centimeter

## CMOS

- Abbreviation of:
  - complementary metal-oxide semiconductor

## CMRR

- Abbreviation of:
  - common-mode rejection ratio

## CMV

- Abbreviation of:
  - common mode voltage

## cos

- Abbreviation of:
  - cosine

## cot(A)

- Symbol for:
  - cotangent

## COTS

- Abbreviation of:
  - commercial off the shelf

## CP

- Abbreviation of:
- clock pulse

## CPS

- Abbreviation of:
- cycles per second
- characters per second

## CQI

- Abbreviation of:
- continuous quality improvement

## CRT

- Abbreviation of:
- cathode ray tube

## CSA

- Abbreviation of:
- Canadian Standards Association

## csc(A)

- Symbol for:
- cosecant (also cosec(A))

## CSIC

- Abbreviation of:
- customer specific integrated circuit

## CT

- Abbreviation of:
- cycle time

## CTE

- Abbreviation of:
- coefficient of thermal expansion

## CW

- Abbreviation of:
- continuous wave

# - D -

## D

- Symbol for:
- electric displacement field (C/m<sup>2</sup>)

## D

- Symbol for:
- density (m/V)

## d

- Symbol for:
- deci (tenth), 10<sup>-1</sup>
- differential

## d

- Subscript for:
- delay
- diameter
- deviation

## dA

- Abbreviation of:
- differential of area

## da

- Symbol for:
- deca (10) Sometimes spelled deka.

## dB

- Symbol for:
- decibel

## DC

- Abbreviation of:
- direct current
- direct coupled

## DC/DC

- Abbreviation of:
- DC/DC converter

## DCL

- Abbreviation of:
- dynamic load characteristic

## dE

- Abbreviation of:
- differential of voltage

## Dec

- Abbreviation of:
- decimal

## Deg

- Abbreviation of:
- degree

## Dem

- Abbreviation of:
- demodulation

## DF

- Symbol for:
- dissipation factor

## DFM

- Abbreviation of:
- design for manufacturability

## DFR

- Abbreviation of:
- design for reliability

## DFT

- Abbreviation of:
- design for test

## di

- Abbreviation of:
- differential of current

## DIA

- Abbreviation of:
- diameter

## DIL

- Abbreviation of:
- dual in line (see DIP below)

## DIN

- Abbreviation of:
- Deutsches Institut für Normung e. V. (German Institute for Standardization)

## DIP

- Abbreviation of:
- dual-inline-package

## DK

- Abbreviation of:
- dielectric constant

## DMM

- Abbreviation of:
- digital multimeter

## dP

- Abbreviation of:
- differential of power

## DPM

- Abbreviation of:
- digital panel meter

## DT

- Abbreviation of:
- dynamic test

## dT

- Abbreviation of:
- differential of temperature

## DUT

- Abbreviation of:
- device under test

## dV

- Abbreviation of:
- differential of voltage

## DVM

- Abbreviation of:
- digital voltmeter

## dZ

- Abbreviation of:
- differential of impedance

# - E -

## E

- Symbol for:
- voltage
- emitter (of transistor)
- exa (quintillion), 10<sup>18</sup>

## E

- Symbol for:
- Energy (Joule)
- Electromotive Force (Volt)
- Electric Field Strength (Volt per coulomb)

## e

- Symbol for:
- electron charge
- Napier's constant

## e

- Subscript for:
- error
- effective
- emitter
- equivalent

## ECO

- Abbreviation of:
- engineering change order

## EIA

- Abbreviation of:
- Electronic Industries Alliance

## EDI

- Abbreviation of:
- electronic data interchange

## EDP

- Abbreviation of:
- electronic data processing

## EFI

- Abbreviation of:
- electromechanical frequency interference

## EHF

- Abbreviation of:
- extremely high frequency

## EHV

- Abbreviation of:
- extra high voltage

## ELF

- Abbreviation of:
- extremely low frequency

## EMC

- Abbreviation of:
- electromagnetic compatibility

## EMF

- Abbreviation of:
- electromotive force

## EMI

- Abbreviation of:
- electromagnetic interference

## EMP

- Abbreviation of:
  - electromagnetic power

## EMU

- Abbreviation of:
  - electromagnetic unit

## EN

- Abbreviation of:
  - enable

## EOL

- Abbreviation of:
  - end of life

## ESD

- Abbreviation of:
  - electrostatic discharge

## ESI

- Abbreviation of:
  - electrostatic interference

## ESL

- Abbreviation of:
  - equivalent series inductance

## ESR

- Abbreviation of:
  - equivalent series resistance

## ESS

- Abbreviation of:
  - environmental stress screening
  - electronic switched systems

## eV

- Abbreviation of:
  - electron volt

# — F —

## F

- Symbol for:
  - Fahrenheit
  - Farad
  - Faraday Constant (C/mol)

- Abbreviation of:
  - fan
  - Fuse
  - Function

## F

- Symbol for:
  - Force (in Newtons)

## f

- Symbol for:
  - femto (quadrillionth),  $10^{-15}$

- Subscript for:
  - field
  - forward
  - filament

## f

- Symbol for:
  - frequency

## FA

- Abbreviation of:
  - failure analysis

## fc

- Abbreviation of:
  - foot candle

## FCS

- Abbreviation of:
  - factory control system

## FCC

- Abbreviation of:
  - Federal Communications Commission

## FE

- Abbreviation of:
  - ferroelectric

## FET

- Abbreviation of:
  - field effect transistor

## FIFO

- Abbreviation of:
  - first in first out

## FI

- Abbreviation of:
  - filter

## Fp

- Abbreviation of:
  - freezing point

## FPM

- Abbreviation of:
  - feet per minute

## FPS

- Abbreviation of:
  - feet per second
  - foot-pound-second (British)

## FRACA

- Abbreviation of:
  - failure reporting, analysis and corrective action

## FS

- Abbreviation of:
  - full scale

## Ft

- Abbreviation of:
  - foot

## FW

- Abbreviation of:
  - full wave
  - field winding

# — G —

## G

- Symbol for:
  - giga (Billion),  $10^9$
  - gauss (magnetic flux density)
  - conductance
  - ground
  - gate (of a semiconductor)

## G

- Symbol for:
  - gravitational constant
  - gain (dB)

## g

- Symbol for:
  - gram
  - gravitational acceleration

- Subscript for:
  - gate

## g

- Symbol for:
  - gravitational field strength
  - gravitational acceleration

## gen

- Abbreviation of:
  - generator (sometimes G)
  - generate

## GFI

- Abbreviation of:
  - ground fault interrupter

## Gnd

- Abbreviation of:
  - ground

## Gm

- Abbreviation of:
  - gram

## Gr

- Abbreviation of:
  - grain

## GPIB

- Abbreviation of:
  - general purpose interface bus

## GUI

- Abbreviation of:
  - graphical user interface

# — H —

## H

- Symbol for:
  - henry
  - magnetic field strength (A/m)
  - hydrogen
  - transfer function

- Abbreviation of:
  - Heater

## h

- Symbol for:
  - hecto (hundred),  $10^2$

- Abbreviation of:
  - hour
  - hybrid

- Subscript for:
  - height
  - hysteresis

## h

- Symbol for:
  - Planck's constant
  - height

## HALT

- Abbreviation of:
  - highly accelerated life testing

## HASS

- Abbreviation of:
  - highly accelerated stress screening

## HAST

- Abbreviation of:
  - highly accelerated stress testing

## Hex

- Abbreviation of:
  - hexadecimal

## HC

- Abbreviation of:
  - heat coil

## HF

- Abbreviation of:
  - high frequency

## hipot

- Abbreviation of:
  - high potential test

## Hr

- Abbreviation of:
  - hour

## HV

- Abbreviation of:
  - high voltage

## Hz

- Abbreviation of:
  - Hertz



## I

- Symbol for:
  - current
  - Input

## i

- Symbol for:
  - instantaneous value
- Abbreviation of:
  - ideal
  - induced
- Subscript for:
  - induced
  - internal
  - input
  - intrinsic

## IC

- Abbreviation of:
  - integrated circuit
  - internal connection

## ICE

- Abbreviation of:
  - in circuit Emulator

## ICT

- Abbreviation of:
  - in circuit test

## ID

- Abbreviation of:
  - inside diameter

## IEC

- Abbreviation of:
  - International Electrotechnical Commission

## IEEE

- Abbreviation of:
  - Institute of Electrical and Electronic Engineers

## IF

- Abbreviation of:
  - intermediate frequency

## In

- Abbreviation of:
  - input
  - inches

## Ind

- Abbreviation of:
  - indirect

## INH

- Abbreviation of:
  - Inhibit

## INT

- Abbreviation of:
  - Interrupt

## INV

- Abbreviation of:
  - inverter

## I/O

- Abbreviation of:
  - input/output

MicroPower Direct

## IPMC

- Abbreviation of:
  - industrial process measurement and control

## IR

- Abbreviation of:
  - insulation resistance
  - induction regulator

## ISL

- Abbreviation of:
  - isolator

## ISO

- Abbreviation of:
  - International Organization for Standards

## Iv

- Symbol for:
  - luminous intensity (in candelas)



## J

- Symbol for:
  - joule
  - emissive power
  - jack

## j

- Subscript for:
  - junction

## JEDEC

- Abbreviation of:
  - Joint Electron Device Engineering Council

## JIT

- Abbreviation of:
  - just in time



## K

- Symbol for:
  - kelvin
  - general symbol for constant

## K

- Symbol for:
  - kinetic energy

## k

- Symbol for:
  - dielectric constant
- Abbreviation of:
  - kilo (thousand), 10<sup>3</sup>
  - key

## k

- Symbol for:
  - Boltzmann constant
  - wavenumber



## L

- Symbol for:
  - Inductance (Henries)
  - Lambert
  - Load
- Abbreviation of:
  - Load
  - inductor

- Subscript for:
  - Inductance
  - Line
  - Load
  - Leakage

## l

- Symbol for:
  - length

## lb

- Symbol for:
  - pound

## LCD

- Abbreviation of:
  - liquid-crystal display

## LED

- Abbreviation of:
  - light-emitting diode

## LFM

- Abbreviation of:
  - linear feet per minute

## LIF

- Abbreviation of:
  - low insertion force

## lm

- Symbol for:
  - lumen

## log

- Abbreviation of:
  - logarithm

## LSI

- Abbreviation of:
  - large scale integration

## Lv

- Symbol for:
  - luminosity (Joules per Second)



## M

- Abbreviation of:
  - Mega (Million), 10<sup>6</sup>
  - motor

## M

- Symbol for:
  - Moment of force (torque)
  - Mutual inductance

## m

- Symbol for:
  - mass
  - modulation coefficient
- Abbreviation of:
  - milli (thousandth), 10<sup>-3</sup>
  - meter
  - mile (mi also used)
  - minute

## MA

- Abbreviation of:
  - magnetic amplifier

## Max

- Abbreviation of:
  - maximum

## Med

- Abbreviation of:
  - median
  - medical

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- min**
- Abbreviation of:
    - minimum
- ML**
- Abbreviation of:
    - module
- MLB**
- Abbreviation of:
    - multi layer board
- mol**
- Symbol for:
    - mole
- MOS**
- Abbreviation of:
    - metal-oxide semiconductor

- MSB**
- Abbreviation of:
    - most significant bit
- MTBF**
- Abbreviation of:
    - mean time between failure
- MTTF**
- Abbreviation of:
    - mean time to failure

- MTTR**
- Abbreviation of:
    - mean time to repair

## — N —

- N**
- Symbol for:
    - Newton
    - Nitrogen
    - Normal Distribution
    - Negative
  - Abbreviation of:
    - number
  - Subscript for:
    - noise
    - nominal
    - refractive index

- N**
- Symbol for:
    - normal

- n**
- Symbol for:
    - neutron
    - nano (billionth),  $10^{-9}$

- NA (N/A)**
- Abbreviation of:
    - not available
    - not applicable

- NC (N/C)**
- Abbreviation of:
    - no connection
    - normally closed

- ND**
- Abbreviation of:
    - non destructive test

- NEC**
- Abbreviation of:
    - National Electrical Code

- NEG**
- Abbreviation of:
    - negative

- NEMA**
- Abbreviation of:
    - National Electrical Manufacturers Association

- NG**
- Abbreviation of:
    - no good

- NO**
- Abbreviation of:
    - normally open
    - number (N also used)

- NP (N/P)**
- Abbreviation of:
    - no pin

- Np**
- Symbol for:
    - neper

- NRE**
- Abbreviation of:
    - nonrecurring engineering

- NTC**
- Abbreviation of:
    - negative temperature coefficient

## — O —

- O**
- Symbol for:
    - oxygen
    - output

- O**
- Subscript for:
    - output

- o**
- Symbol for:
    - origin

- OAT**
- Abbreviation of:
    - operating ambient temperature

- OC**
- Abbreviation of:
    - open circuit

- OCV**
- Abbreviation of:
    - open circuit voltage

- OD**
- Abbreviation of:
    - oven dry

- OEM**
- Abbreviation of:
    - original equipment manufacturer

- Od**
- Abbreviation of:
    - outside diameter

- OI**
- Abbreviation of:
    - opto isolator

- Op**
- Abbreviation of:
    - operation

- Opt**
- Abbreviation of:
    - optical

- OTS**
- Abbreviation of:
    - off the shelf

- OV**
- Abbreviation of:
    - overload

- OVP**
- Abbreviation of:
    - over voltage protection

- Oz**
- Abbreviation of:
    - ounce

## — P —

- P**
- Symbol for:
    - power
    - positive
  - Abbreviation of:
    - pressure
    - primary
    - peta (quadrillion),  $10^{15}$
    - pulse
    - pole
  - Subscript for:
    - parasitic
    - primary

- P**
- Symbol for:
    - permeance

- p**
- Symbol for:
    - pico (trillionth),  $10^{-12}$
    - pound

- p**
- Symbol for:
    - momentum (in Columbs)

- Pa**
- Symbol for:
    - Pascal (pressure)

- par**
- Abbreviation of:
    - parallel

- PARD**
- Abbreviation of:
    - periodic and random deviation

- PCB**
- Abbreviation of:
    - printed circuit board

- PD**
- Abbreviation of:
    - pull down

- PF**
- Abbreviation of:
    - power factor

- PFC**
- Abbreviation of:
    - power factor correction

- PH**
- Abbreviation of:
    - phase

- PIV**
- Abbreviation of:
    - peak inverse voltage

- Pk**
- Abbreviation of:
    - peak

## Pk - Pk

- Abbreviation of:
  - peak to peak

## Pos

- Abbreviation of:
  - positive

## Pot

- Abbreviation of:
  - potentiometer
  - potential

## ppb

- Abbreviation of:
  - parts per billion

## ppm

- Abbreviation of:
  - parts per million
  - pulses per minute

## ppt

- Abbreviation of:
  - parts per thousand

## Pri

- Abbreviation of:
  - primary

## PU

- Abbreviation of:
  - pull up

## PS

- Abbreviation of:
  - power supply

## PSRR

- Abbreviation of:
  - power supply rejection ratio

## PT

- Abbreviation of:
  - punch through

## PTC

- Abbreviation of:
  - positive temperature coefficient

## PWM

- Abbreviation of:
  - pulse width modulation
  - pulse width modulator

## Pwr

- Abbreviation of:
  - power

## — Q —

## Q

- Symbol for:
  - electrical charge
  - quit (turn off)
  - heat (energy)
  - flow rate
- Subscript for:
  - quiescent

## q

- Symbol for:
  - electrical charge
  - deceleration

## QA

- Abbreviation of:
  - quality assurance

## QC

- Abbreviation of:
  - quality control

## QCL

- Abbreviation of:
  - qualified component list

## QIS

- Abbreviation of:
  - quality information system

## QCL

- Abbreviation of:
  - qualified component list

## QoS

- Abbreviation of:
  - quality of service

## QPL

- Abbreviation of:
  - qualified product list

## QTY

- Abbreviation of:
  - quantity

## Qv

- Symbol for:
  - luminous energy

## QVL

- Abbreviation of:
  - qualified vendor list

## — R —

## R

- Symbol for:
  - resistance (in ohms)
- Subscript for:
  - resistance
  - rated
  - reverse
  - residual

## R

- Symbol for:
  - reluctance

## r

- Symbol for:
  - radius
  - rotor
  - location vector

## rac

- Abbreviation of:
  - rectified alternating current

## rad

- Symbol for:
  - radian

## RC

- Abbreviation of:
  - remote control
  - resistance capacitance

## R&D

- Abbreviation of:
  - research and development

## Rect

- Abbreviation of:
  - rectifier (rectification)

## Ref

- Abbreviation of:
  - reference

## Res

- Abbreviation of:
  - resistance

## REQ

- Abbreviation of:
  - required

## RF

- Abbreviation of:
  - radio frequency

## RFQ

- Abbreviation of:
  - request for quote

## RFI

- Abbreviation of:
  - radio frequency interference

## RFQ

- Abbreviation of:
  - request for quote

## rh

- Abbreviation of:
  - relative humidity

## RMA

- Abbreviation of:
  - returned material authorization

## rms

- Abbreviation of:
  - root mean square

## RoHS

- Abbreviation of:
  - Restriction of Hazardous Substances

## ROW

- Abbreviation of:
  - rest of the world

## rpm

- Abbreviation of:
  - revolutions per minute

## rps

- Abbreviation of:
  - revolutions per second

## RS

- Abbreviation of:
  - recommended standard

## RT

- Abbreviation of:
  - room temperature

## RY

- Abbreviation of:
  - relay

## — S —

## S

- Symbol for:
  - switch
  - secondary
  - signal
  - Siemens (conductance)
- Abbreviation of:
  - sine
- Subscript for:
  - signal
  - secondary
  - series

## s

- Abbreviation of:
  - second
  - stator

- Symbol for:
  - distance (or displacement)
  - standard deviation

**sat**

- Abbreviation of:
  - saturate

**sc**

- Abbreviation of:
  - short circuit

**SCR**

- Abbreviation of:
  - silicon controlled rectifier

**SD**

- Abbreviation of:
  - surge diverter

**sec**

- Abbreviation of:
  - second
  - secondary

**SELV**

- Abbreviation of:
  - safety extra low voltage

**ser**

- Abbreviation of:
  - series
  - serial

**SHW**

- Abbreviation of:
  - shunt winding

**SIC**

- Abbreviation of:
  - Standard Industrial Classification

**sig**

- Abbreviation of:
  - signal

**sin**

- Abbreviation of:
  - sinusoidal

**SIP**

- Abbreviation of:
  - single inline package

**SMC**

- Abbreviation of:
  - surface-mount components

**SMD**

- Abbreviation of:
  - surface-mount devices

**SMPS**

- Abbreviation of:
  - switch-mode power supply

**SMT**

- Abbreviation of:
  - surface-mount technology

**SNR**

- Abbreviation of:
  - signal to noise ratio

**SPC**

- Abbreviation of:
  - statistical process control

**SPS**

- Abbreviation of:
  - samples per second

**spec**

- Abbreviation of:
  - specification

**SQC**

- Abbreviation of:
  - statistical quality control

**std**

- Abbreviation of:
  - standard

**STP**

- Abbreviation of:
  - shielded twisted pair

**STR**

- Abbreviation of:
  - Storage

**STRIFE**

- Abbreviation of:
  - stress and life (testing)

**SVP**

- Abbreviation of:
  - surge voltage protector

**SW**

- Abbreviation of:
  - series winding

**SWR**

- Abbreviation of:
  - standing wave ratio

**sync**

- Abbreviation of:
  - synchronization
  - synchronizing signal

**sym**

- Abbreviation of:
  - symmetrical

**sys**

- Abbreviation of:
  - system

**— T —**

**T**

- Symbol for:
  - transformer
  - temperature
  - tesla
  - Tera (trillion), 10<sup>12</sup>
  - lumen second (Talbot)
- Abbreviation of:
  - ton (also t and tn)

**T**

- Symbol for:
  - transmittance
  - time constant
  - torque
  - period

**t**

- Symbol for:
  - time
  - tension

**Ta**

- Abbreviation of:
  - tantalum

**TCE**

- Abbreviation of:
  - temperature coefficient of expansion
  - thermal coefficient of expansion

**Term**

- Abbreviation of:
  - terminate

**THD**

- Abbreviation of:
  - total harmonic distortion

**THE**

- Abbreviation of:
  - Technical Help to Exporters

**TP**

- Abbreviation of:
  - time pulse

**TQ**

- Abbreviation of:
  - total quality

**TQC**

- Abbreviation of:
  - total quality control

**TRIG**

- Abbreviation of:
  - trigger

**TUV**

- Abbreviation of:
  - Technischer Überwachungsverein (Technical Inspection Association)

**— U —**

**U**

- Symbol for:
  - universal set
- Abbreviation of:
  - unit

**UL**

- Symbol for:
  - Underwriters Laboratories

**UPS**

- Abbreviation of:
  - uninterruptible power supply

**UTP**

- Abbreviation of:
  - unshielded twisted pair

**— V —**

**V**

- Symbol for:
  - volt

**v**

- Abbreviation of:
  - vector

**v**

- Symbol for:
  - velocity

**VA**

- Abbreviation of:
  - volt-ampere

**VAC**

- Abbreviation of:
  - vacuum
  - volts alternating current

**VCO**

- Abbreviation of:
  - voltage controlled oscillator

**VD**

- Abbreviation of:
  - voltage drop

**VDC**

- Abbreviation of:
  - volts direct current



## VDE

- Abbreviation of:
  - Verband der Elektrotechnik, Elektronik und Informationstechnik (Association for Electrical, Electronic & Information Technologies)

## VFO

- Abbreviation of:
  - variable-frequency oscillator

## VHF

- Abbreviation of:
  - very high frequency

## VHR

- Abbreviation of:
  - very high resistance

## VHSIC

- Abbreviation of:
  - very high speed IC

## VLSI

- Abbreviation of:
  - very-large-scale integration

— W —

## W

- Symbol for:
  - energy
  - work

## • Abbreviation of:

- watt
- width

## w

- Abbreviation of:
  - weight (wt also used)

## WG

- Abbreviation of:
  - wire gauge

## WH

- Abbreviation of:
  - watt-hour

## WIP

- Abbreviation of:
  - work in progress

## wdg

- Abbreviation of:
  - winding

## ww

- Abbreviation of:
  - wirewound

— X —

## X

- Symbol for:
  - reactance

## • Abbreviation of:

- no connection
- unknown quantity

## Xc

- Symbol for:
  - capacitive reactance

## XI

- Symbol for:
  - inductive reactance

— Y —

## Y

- Symbol for:
  - admittance

## y

- Abbreviation of:
  - year (yr also used)
  - yard (yd also used)

— Z —

## Z

- Symbol for:
  - impedance

## z

- Abbreviation of:
  - zero
  - zone

# SYMBOLS

## A alpha (upper case)

- Symbol for:
  - Ampere

## α alpha (lower case)

- Symbol for:
  - current gain of a common base bipolar transistor stage

## β beta (lower case)

- Symbol for:
  - current gain of a common emitter bipolar transistor stage

## Δ delta (upper case)

- Symbol for:
  - A change or differential in measured values

## δ delta (lower case)

- Symbol for:
  - deflection

## E epsilon (upper case)

- Symbol for:
  - voltage

## ε epsilon (lower case)

- Symbol for:
  - electromotive force

## η eta (lower case)

- Symbol for:
  - efficiency

## Γ gamma (upper case)

- Symbol for:
  - gamma function

## Υ gamma (lower case)

- Symbol for:
  - angle

## I iota (upper case)

- Symbol for:
  - current

## Λ lambda (upper case)

- Symbol for:
  - equivalent conductivity

## λ lambda (lower case)

- Symbol for:
  - wavelength

## ν nu (lower case)

- Symbol for:
  - reluctance

## μ mu (lowercase)

- Symbol for:
  - micro

## Ω omega (uppercase)

- Symbol for:
  - ohms

## ω omega (lowercase)

- Symbol for:
  - angular velocity

## Φ phi (uppercase)

- Symbol for:
  - magnetic flux

## φ phi

- Symbol for:
  - phi (lowercase) angle

## π Pi (lower case)

- Symbol for:
  - mathematical constant Pi

## Ψ psi (lower case)

- Symbol for:
  - phase difference

## ρ rho (lower case)

- Symbol for:
  - thermal resistivity

## σ sigma (lower case)

- Symbol for:
  - conductivity

## τ Tau (lower case)

- Symbol for:
  - torque
  - time constant in an RC circuit

## Θ theta (upper case)

- Symbol for:
  - phase angle

## θ theta (lower case)

- Symbol for:
  - thermal resistance

## W

- Symbol for:
  - watt

## χ Chi (lower case)

- Symbol for:
  - electric susceptibility,
  - magnetic susceptibility

## Z

- Symbol for:
  - impedance