Fault Protected High-Speed CAN FD Transceiver with Silent Mode

Features

- Meets the ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5 Physical Layer Standards
- Supports CAN FD and Data Rating up to 5 Mbps
- Short Propagation Delay Times and Fast Loop Times
- 5-V Power Supply, I/O Voltage Range Supports 2.8-V to 5.5-V MCU Interface
- Common-Mode Input Voltage: ±30 V
- Protection Feature:
  - IEC 61000-4-2 ESD Protection up to ±15 kV
  - Bus Fault Protection: ±42 V
  - VCC and VIO (TPT1256 only) Under-voltage Protection
  - TXD Dominant Time-out Function and Bus-Dominant Time-out Function
  - Thermal Shutdown Protection
- Available in SOP8 Package and Leadless DFN3X3 Package

Applications

- All Devices Supporting Highly Loaded CAN Networks
- Field Industrial Automation, Sensors, and Drive Systems
- Building, Security Control Systems
- Energy Storage systems
- Telecom Base Station Status and Control

Description

The TPT125x device is a CAN transceiver that meets the ISO11898 High-speed CAN (Controller Area Network) physical layer standard. The device is designed to be used in CAN FD networks up to 5 Mbps, and to enhance timing margin and higher data rates in long and high-loading networks. As designed, the device features cross-wire, overvoltage, and loss of ground protection from −42 V to +42 V, overtemperature shutdown, and a −30 V to +30 V common-mode range. The TPT1256 has a secondary power supply input for I/O level shifting the input pin thresholds and RXD output level. The device comes with a silent mode which is also commonly referred to as listen-only mode, and it includes many protection features to enhance device and network robustness.

The TPT125x is available in SOP-8 and DFN3X3-8L packages and characterized from –40°C to +125°C.

Typical Application Circuit

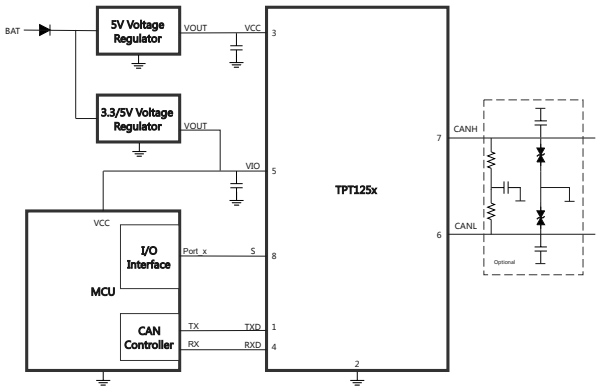


Table of Contents

Product Family Table

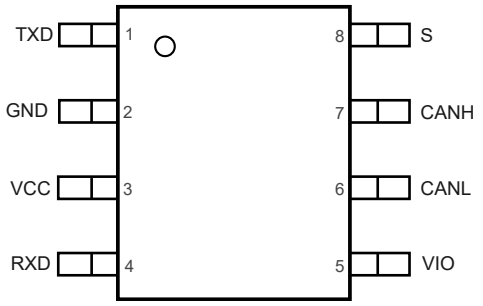
Order Number	VCC (V)	VIO (V)	BUS Protection (V)	Package
TPT1255-SO1R	4.5 to 5.5	NC	±42	SOP-8
TPT1256-SO1R	4.5 to 5.5	2.8 to 5.5	±42	SOP-8
TPT1255-DF6R	4.5 to 5.5	NC	±42	DFN3X3-8L
TPT1256-DF6R	4.5 to 5.5	2.8 to 5.5	±42	DFN3X3-8L

Revision History

Date	Revision	Notes
2021-06-18	Rev.Pre.0	Initial Version
2022-04-26	Rev.A.0	Released version
2022-05-26	Rev.A.1	Updated the notes of Order Information
2022-06-17	Rev.A.2	Updated the DFN package POD, tape and reel Information of the DFN
2022-08-05	Rev.A.3	Updated the description of TPT1256 pin VIO
2023-06-20	Rev.A.4	Updated the new format

Pin Configuration and Functions

TPT1256
SOP8 Package
Top View



TPT1256
DFN3X3-8 Package
Top View

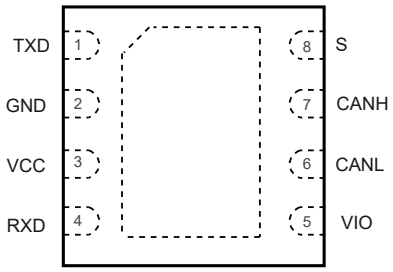
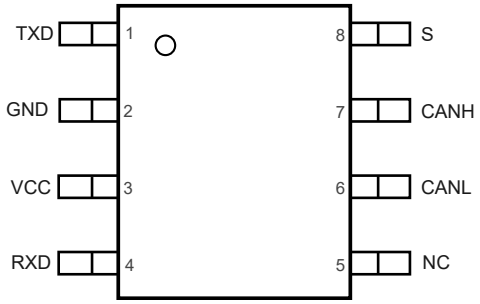


Table 1. Pin Functions: TPT1256

Pin		I/O	Description
No.	Name		
1	TXD	I	CAN transmit data input (LOW for dominant and HIGH for recessive bus states)
2	GND	GND	Ground
3	VCC	POWER	Transceiver 5 V supply voltage
4	RXD	O	CAN receive data output (LOW for dominant and HIGH for recessive bus states)
5	VIO	POWER	Transceiver I/O level shifting supply voltage
6	CANL	BUS I/O	Low level CAN bus input/output line
7	CANH	BUS I/O	High level CAN bus Input/output line
8	S	I	Silent (listen-only) mode , Mode control (Active High)

TPT1255
SOP8 Package
Top View



TPT1255
DFN3X3-8 Package
Top View

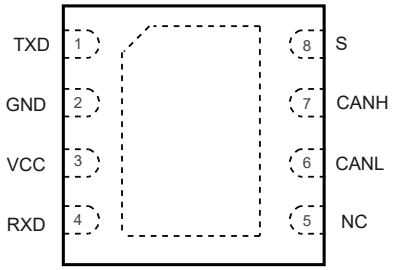


Table 2. Pin Functions: TPT1255

Pin		I/O	Description
No.	Name		
1	TXD	I	CAN transmit data input (Low for dominant and High for recessive bus states)
2	GND	GND	Ground
3	VCC	Power	Transceiver 5 V supply voltage
4	RXD	O	CAN receive data output (Low for dominant and High for recessive bus states)
5	NC	−	Not Connected
6	CANL	Bus I/O	Low-level CAN bus input/output line
7	CANH	Bus I/O	High-level CAN bus input/output line
8	S	I	Silent (listen-only) mode , Mode control (Active High)

Specifications

Absolute Maximum Ratings

Parameter		Min	Max	Unit
V_{CC}	5-V Bus Supply Voltage Range	−0.3	7	V
V_{IO}	I/O Level-Shifting Voltage Range	−0.3	7	V
V_{BUS}	Can Bus I/O Voltage Range (CANH, CANL)	−42	42	V
$V_{(Logic\_Input)}$	Logic Input Terminal Voltage Range (TXD, S)	−0.3	7	V
$V_{(Logic\_Output)}$	Logic Output Terminal Voltage Range (RXD)	−0.3	7	V
I_{O_RXD}	Rxd (Receiver) Output Current	−8	8	mA
T_J	Maximum Junction Temperature	−40	150	°C
T_{STG}	Storage Temperature Range	−65	150	°C

(1) Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to any Absolute Maximum Rating condition for extended periods may affect device reliability and lifetime.
(2) This data was taken with the JEDEC low effective thermal conductivity test board.
(3) This data was taken with the JEDEC standard multilayer test boards.

ESD(Electrostatic Discharge Protection)

Parameter		Condition	Minimum Level	Unit
IEC	IEC Contact Discharge	IEC-61000-4-2, Bus Pin	±15	kV
	IEC Air-Gap Discharge	IEC-61000-4-2, Bus Pin	±15	kV
HBM	Human Body Model ESD(1)	ANSI/ESDA/JEDEC JS-001, Bus Pin	±15	kV
		ANSI/ESDA/JEDEC JS-001, All Pin Except Bus Pin	±6	kV
CDM	Charged Device Model ESD(2)	ANSI/ESDA/JEDEC JS-002, All Pin	±1.5	kV
LU	Latch up	Latch up per JESD78, All Pin	±500	mA

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

Recommended Operating Conditions

	Parameter	Min	Max	Unit
V_{IO}	Input/output voltage, TXD, RXD,S of TPT1256	3.0	5.5	V
V_{CC}	Power Supply	4.5	5.5	V
$I_{OH(RXD)}$	RXD Terminal High-Level Output Current	−2	-	mA
$I_{OL(RXD)}$	RXD Terminal Low-Level Output Current	-	2	mA
T_A	Operating Ambient Temperature	−40	125	°C

Thermal Information

Package Type	θ_{JA}	θ_{JC}	Unit
SOP8	118	48	°C/W
DFN3x3-8	52	23	°C/W

Electrical Characteristics

All test conditions: V_{CC} = 4.5 V to 5.5 V, V_{IO} = 3.0 V to 5.5 V, T_A = −40°C to 125°C, unless otherwise noted.

Parameter		Test Conditions	Min	Typ	Max	Unit
I_{CC}	Normal Mode (dominant)	TXD = 0 V, R_L = 60 Ω, C_L = open, R_{CM} = open, S = 0 V		50	70	mA
		TXD = 0 V, R_L = 50 Ω, C_L = open, R_{CM} = open, S = 0 V		52	80	mA
	Normal Mode (dominant – bus fault)	TXD = 0 V, S = 0 V, CANH = CANL = -3 /+18V, R_L = open, C_L = open, R_{CM} = open		73	150	mA
	Normal Mode (recessive)	TXD = V_{IO}, R_L = 50 Ω, C_L = open, R_{CM} = open, S = 0 V		1.2	2.5	mA
	Silent Mode	TXD = V_{IO}, R_L = 50 Ω, C_L = open, R_{CM} = open, S = VCC		1.2	2.5	mA
I_{IO}	Normal and Silent Modes	RXD Floating, TXD = S = 0 or V_{IO}		73	200	μA
UV_{VCC}	Rising Undervoltage Detection on V_{CC} for Protected Mode			4	4.4	V
	Falling Undervoltage Detection on V_{CC} for Protected Mode		3.6	3.9	4.2	
$V_{HYS(UVVCC)}$	Hysteresis Voltage on U_{VVCC} (1)			200		mV
UV_{VIO}	Undervoltage Detection on V_{IO} for Protected Mode	V_{IH} and V_{IL}	1.3		2.75	V
$V_{HYS(UVVIO)}$	Hysteresis Voltage on U_{VVIO} for Protected Mode (1)			150		mV
Pin-S (mode select input)						
V_{IH}	High-level Input Voltage	TPT1256	0.7 x V_{IO}			V
		TPT1255	2			
V_{IL}	Low-level Input Voltage	TPT1256			0.3 x V_{IO}	
		TPT1255			0.8	
I_{IH}	High-level Input Leakage Current	S = V_{CC}or V_{IO}= 5.5 V			30	μA
I_{IL}	Low-level Input Leakage Current	S = 0 V, V_{CC}= V_{IO}= 5.5 V	−1	0	1	
$I_{lkg(OFF)}$	Unpowered Leakage Current	S = 5.5 V, V_{CC}= V_{IO}= 0 V	−1	0	1	
Pin-TXD (CAN transmit data input)						
V_{IH}	High-level Input Voltage	TPT1256	0.7 x V_{IO}			V
		TPT1255	2			

Parameter			Test Conditions	Min	Typ	Max	Unit
V_{IL}	Low-level Input Voltage		TPT1256			0.3 x V_{IO}	
			TPT1255			0.8	
I_{IH}	High-level Input Leakage Current		S = V_{CC}or V_{IO}= 5.5 V	−2.5	0	1	μA
I_{IL}	Low-level Input Leakage Current		S = 0 V, V_{CC}= V_{IO}= 5.5 V	−100	−63	−7	
$I_{lkg(OFF)}$	Unpowered Leakage Current		TXD = 5.5 V, V_{CC}= V_{IO}= 0 V	−1	0	1	
C_I	Input Capacitance (1)				5		pF
Pin- RXD (CAN Receive data output)							
V_{OH}	High-level Output Voltage		TPT1256, I_O= −2 mA	0.8 × V_{IO}			V
			TPT1255, I_O= −2 mA	4	4.6		
V_{OL}	Low-level Output Voltage		TPT1256, I_O= +2 mA			0.2 x V_{IO}	
			TPT1255, I_O= +2 mA		0.2	0.4	
$I_{lkg\ (OFF)}$	Unpowered Leakage Current		RXD = 5.5 V, V_{CC}= 0 V, V_{IO} = 0 V	−1	0	1	μA
Driver Electrical Characteristics							
$V_{O(DOM)}$	Bus Output Voltage (dominant)	CANH	TXD = 0 V, S = 0 V, 45 Ω ≤ R_L≤ 65 Ω, C_L= open, R_{CM}= open	2.75		4.5	V
		CANL		0.5		2.25	V
$V_{O(REC)}$	Bus Output Voltage (recessive)	CANH CANL	TXD = V_{CC}, V_{IO}= V_{CC}, S = V_{CC}or 0 V(2), R_L= open (no load), R_{CM} = open	2	0.5 x V_{CC}	3	V
$V_{OD(DOM)}$	Differential Output Voltage (dominant)	CANH CANL	TXD = 0 V, S = 0 V, 45 Ω ≤ R_L< 50 Ω, C_L= open, R_{CM}= open	1.4		3	V
			TXD = 0 V, S = 0 V, 50 Ω ≤ R_L≤ 65 Ω, C_L= open, R_{CM}= open	1.5		3	V
			TXD = 0 V, S =0 V, R_L = 2240 Ω, C_L = open, RCM = open, V_{CC} = 4.5 V~5.25 V	1.5		5	V
$V_{OD(REC)}$	$V_{OD(REC)}$	$V_{OD(REC)}$	TXD = V_{CC}, S = 0 V, R_L = 60 Ω, C_L = open, R_{CM} = open	−120		12	mV
			TXD = V_{CC}, S = 0 V, R_L = open (no load), C_L = open, R_{CM} = open	−50		50	mV
V_{SYM}	Transient Symmetry (dominant or recessive), ($V_{O(CANH)}$ + $V_{O(CANL)}$) / V_{CC} (2)		S at 0 V, R_{term}= 60 Ω, C_{split} = 4.7 nF, C_L= open,		1		V/V
			R_{CM}= open, T_{XD}= 250 kHz, 1 MHz				

Parameter		Test Conditions	Min	Typ	Max	Unit
V_{SYM_DC}	DC Output Symmetry (dominant or recessive), (V_{CC} – $V_{O(CANH)}$ – $V_{O(CANL)}$) (2)	S = 0 V, R_L= 60 Ω, C_L= open, R_{CM}= open	−0.4		0.4	V
$I_{OS(SS\_DOM)}$	Short-circuit Steady-State Output Current, dominant	S at 0 V, V_{CANH}= −5 V to 40 V, CANL = open, TXD = 0 V	−100			mA
		S at 0 V, V_{CANL}= −5 V to 40 V, CANH = open, TXD = 0 V			100	
$I_{OS(SS\_REC)}$	Short-circuit Steady-State Output Current, recessive	−27 V ≤ V_{BUS} ≤ 32 V, Where V_{BUS} = CANH = CANL, TXD = V_{CC}	−5		5	mA
Receiver Electrical Characteristics						
V_{CM}	Common Mode Range, normal mode	S = 0 or V_{CC} or V_{IO}	−30		30	V
V_{IT+}	Positive-going Input Threshold Voltage, all modes	S = 0 or V_{CC}or V_{IO},			900	mV
V_{IT-}	Negative-going Input Threshold Voltage, all modes	−20 V ≤ V_{CM}≤ +20 V	500			
V_{IT+}	Positive-going Input Threshold Voltage, all modes	S = 0 or V_{CC}or V_{IO},			1000	mV
V_{IT-}	Negative-going Input Threshold Voltage, all modes	−30 V ≤ V_{CM}≤ +30 V	400			
V_{HYS}	Hysteresis Voltage (V_{IT+}− V_{IT-}) (1)	S = 0 or V_{CC} or V_{IO}		120		mV
$I_{lkg(IOFF)}$	Power-off (unpowered) Bus Input Leakage Current	CANH = CANL = 5 V, V_{CC}= V_{IO} = 0 V			3	μA
C_I	Input Capacitance to Ground (CANH or CANL) (1)			25		pF
C_{ID}	Differential Input Capacitance (1)			2		pF
R_{ID}	Differential Input Resistance	TXD = V_{CC}= V_{IO}= 5 V,	30		80	kΩ
R_{IN}	Input Resistance (CANH or CANL)	S = 0 V, −30 V ≤ V_{CM}≤ +30 V	15		40	kΩ
$R_{IN(M)}$	Input Resistance Matching: [1 − $R_{IN(CANH)}$ / $R_{IN(CANL)}$] × 100%	V_{CANH} = V_{CANL} = 5 V	−1%		1%	

(1) The Test data is based on bench test and design simulation.
(2) Test data based on bench test and design simulation, V_{sym} = 0.9 ~ 1.1 V/V at 250 kbps

AC Timing Requirements

All test conditions: V_{CC} = 4.5 V to 5.5 V, V_{IO} = 3.0 V to 5.5 V, T_A = −40°C to 125°C, unless otherwise noted.

Parameter		Test Conditions	Min	Typ	Max	Unit
Device Switching Characteristics						
$t_{PROP(LOOP1)}$	Total loop delay, driver input (TXD) to receiver output (RXD), recessive to dominant	S = 0 V, R_L = 60 Ω, C_L = 100 pF, $C_{L(RXD)}$ = 15 pF	-	100	160	ns
$t_{PROP(LOOP2)}$	Total loop delay, driver input (TXD) to receiver output (RXD), dominant to recessive		-	110	175	
t_{MODE}	Mode change time, from Normal to Silent or from Silent to Normal		-	0.15	10	µs
Driver Switching Characteristics						
t_{pHR}	Propagation delay time, high TXD to driver recessive (dominant to recessive)(1)	S = 0 V, R_L= 60 Ω, C_L = 100 pF, R_{CM}= open	-	70	-	ns
t_{pLD}	Propagation delay time, low TXD to driver dominant (recessive to dominant)(1)		-	40	-	
$t_{sk(p)}$	Pulse skew ($\|t_{pHR}- t_{pLD}\|$) (1)		-	20	-	
t_R	Differential output signal rise time(1)		-	27	-	
t_F	Differential output signal fall time(1)		-	35	-	
t_{TXD_DTO}	Dominant timeout	S = 0 V, R_L= 60 Ω, C_L= open	1.2		3.8	ms
Receiver Switching Characteristics						
t_{pRH}	Propagation delay time, bus recessive input to high output (Dominant to Recessive)(1)	S = 0 V, $C_{L(RXD)}$= 15 pF	-	76	-	ns
t_{pDL}	Propagation delay time, bus dominant input to low output (Recessive to Dominant)(1)		-	59	-	
t_R	RXD Output signal rise time(1)		-	12	-	
t_F	RXD Output signal fall time(1)		-	7	-	
FD Timing Parameters						
$t_{BIT(BUS)}$	Bit time on CAN bus output pins with $t_{BIT(TXD)}$ = 500 ns, all devices	S = 0 V, R_L= 60 Ω, C_L = 100 pF, $C_{L(RXD)}$ = 15 pF, $\Delta t_{REC} = t_{BIT(RXD)} - t_{BIT(BUS)}$	435	-	530	ns
	Bit time on CAN bus output pins with $t_{BIT(TXD)}$ = 200 ns, G device variants only		155	-	210	

Parameter		Test Conditions	Min	Typ	Max	Unit
$t_{BIT(RXD)}$	Bit time on RXD output pins with $t_{BIT(TXD)}$ = 500 ns, all devices		400	-	550	
	Bit time on RXD output pins with $t_{BIT(TXD)}$ = 200 ns, G device variants only		120	-	220	
Δt_{REC}	Receiver timing symmetry with $t_{BIT(TXD)}$ = 500 ns, all devices		−65	-	40	
	Receiver timing symmetry with $t_{BIT(TXD)}$ = 200 ns, G device variants only		−45	-	15	

(1) The test data is based on bench test and design simulation.

Detailed Description

Overview

The TPT125x device is a CAN transceiver that meets the ISO11898 High-speed CAN (Controller Area Network) physical layer standard. The device is designed to be used in CAN FD networks up to 5 Mbps, and to enhance timing margin and higher data rates in long and high-loading networks. As designed, the device features cross-wire, overvoltage, and loss of ground protection from −42 V to +42 V, overtemperature shutdown, and a −30 V to +30 V common-mode range. The TPT1256 has a secondary power supply input for I/O level shifting the input pin thresholds and RXD output level. The device comes with a silent mode which is also commonly referred to as listen-only mode, and it includes many protection features to enhance device and network robustness.

Functional Block Diagram

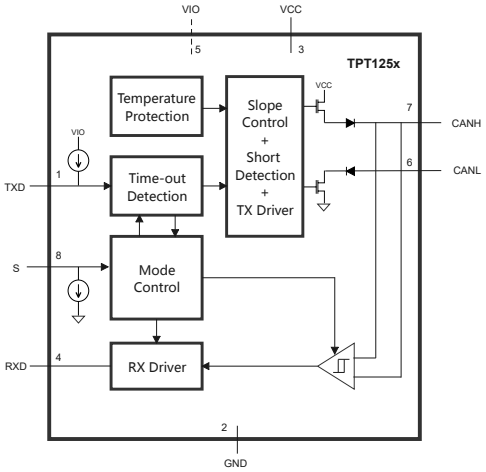


Figure 1. Functional Block Diagram

Feature Description

Under-voltage Lockout (UVLO)

The TPT1256 uses an under-voltage lockout circuit to keep the device in shutdown mode until the supply voltage is higher than the UVLO threshold.

Over Temperature Protection (OTP)

The TPT125x integrates foldback circuit and over-temperature protection to prevent device from over-heated and damage. When the junction temperature is higher than T_{OTP}, 150°C, a current thermal foldback circuit starts to work and decrease the device output charge current gradually with T_J rise. If T_J still rises and reaches 180°C, the device will shut down charging loop until T_J drops below 100°C.

Time-out Function in TXD Dominant Mode

When the TXD pin is set to low, the timer of 'TXD dominant time-out' is started. If the low state on TXD persists for longer than t_{TXD_DTO} , the transmitter is disabled and the bus lines are in recessive state. This function prevents a hardware

and/or software application failure from driving the bus lines to a permanent dominant state which will block all network communications. The TXD dominant time-out timer is reset as TXD is pulled to high.

Over-Temperature Protection (OTP)

The output drivers are protected against over-temperature conditions. If the virtual junction temperature exceeds the shutdown junction temperature T_{OTP} , the output drivers will be disabled until the virtual junction temperature falls below T_{OTP} and TXD becomes recessive again. Including the TXD condition to ensures output driver oscillation due to temperature drift is avoided.

Table 3. Driver Function Table

Device	Inputs		Outputs		Driven BUS State
	S	TXD	CANH	CANL	
All Devices	L or open	L	H	L	Dominant
		H or Open	Z	Z	Recessive
	H	X	Z	Z	Recessive

Table 4. Receiver Function Table

Device Mode	CAN Differential Inputs V_{ID} = V_{CANH} − V_{CANL}	Bus State	RXD Terminal
Normal or Silent	$V_{ID} \geq V_{IT+(MAX)}$	Dominant	L
	$V_{IT-(MIN)} < V_{ID} < V_{IT+(MAX)}$	Indeterminate	Indeterminate
	$V_{ID} \leq V_{IT-(MIN)}$	Recessive	H
	Open ($V_{ID} \approx 0$ V)	Open	H

Normal Mode

A low level on the S pin selects the normal mode. In this mode, the transceiver will transmit and receive data via the bus lines CANH and CANL. The differential receiver converts the analog data on the bus lines into digital data, which is output to the RXD pin. The slopes of the output signals on the bus lines are controlled internally and optimized to guarantee the lowest possibility for Electro Magnetic Emission (EME).

Silent Mode

A high level on the S pin selects the silent mode. In the silent mode, the transmitter is disabled, releasing the bus pins to the recessive state. All other IC functions, including the receiver, continue to operate as in the normal mode, just like the listen-only mode. Silent mode can be used to prevent a faulty CAN controller from disrupting all network communications.

Application and Implementation

> Note
>
> Information in the following application sections is not part of the 3PEAK's component specification and 3PEAK does not warrant its accuracy or completeness. 3PEAK's customers are responsible for determining suitability of components for their purposes. Customers should validate and test their design implementation to confirm system functionality.

Application Information

The TPT1256 device is a CAN transceiver to support CAN FD function up to 5 Mbps, with BUS protection voltage from –42 V to +42 V, overtemperature shutdown, and a −30 V to +30 V common-mode range. The VIO of TPT1256 can support the voltage level of TXD and RXD from 3.3 V to 5.0 V, and the pin 5 of TPT1255 is NC which means it can only support 5-V I/O voltage.

The following sections show typical applications of the TPT1256 and TPT1255.

Typical Application

Figure 2 shows the typical application schematic of the TPT125x.

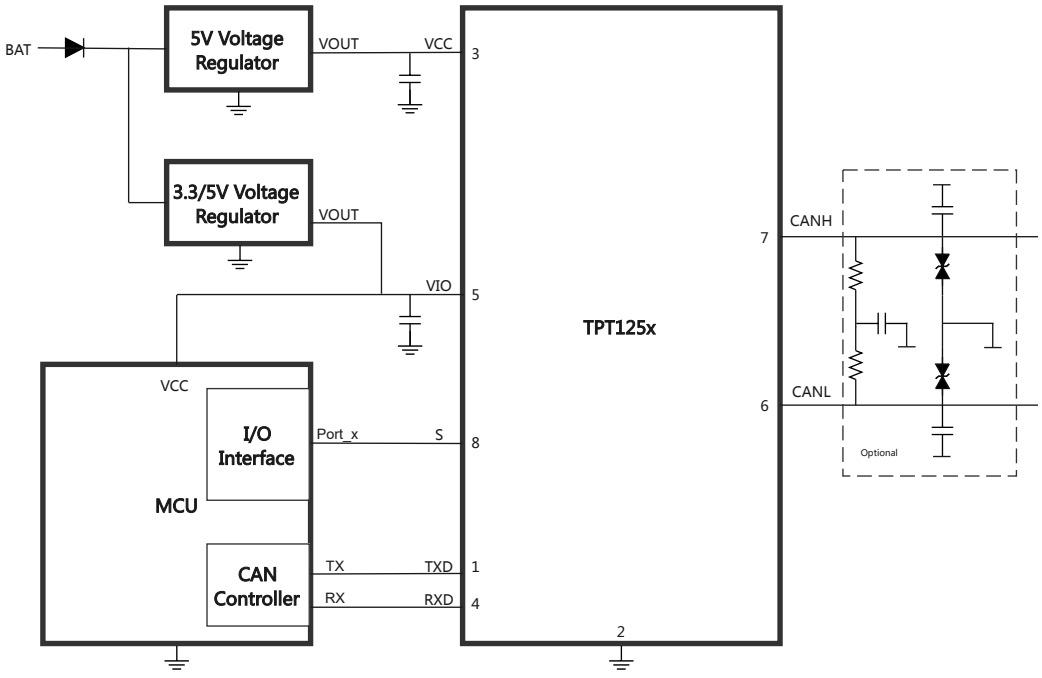
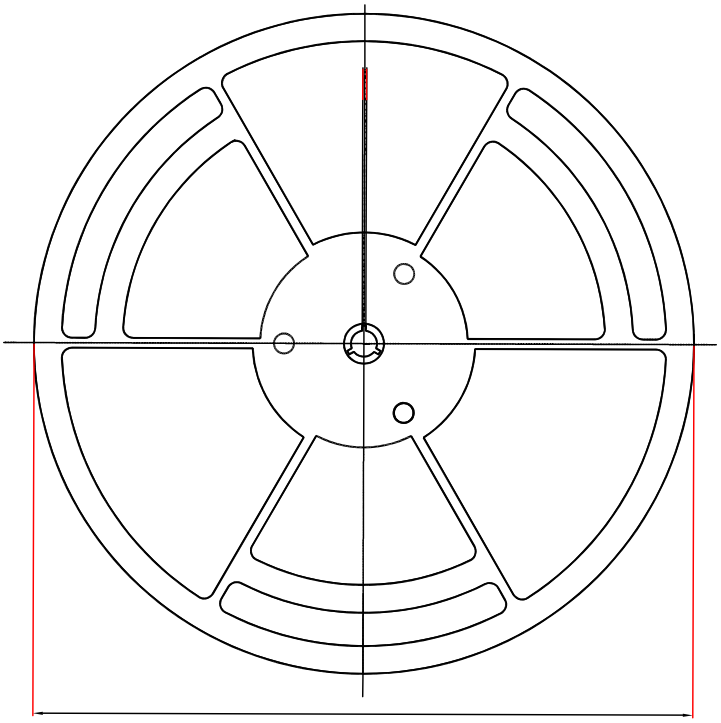
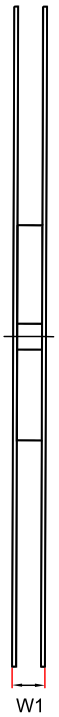
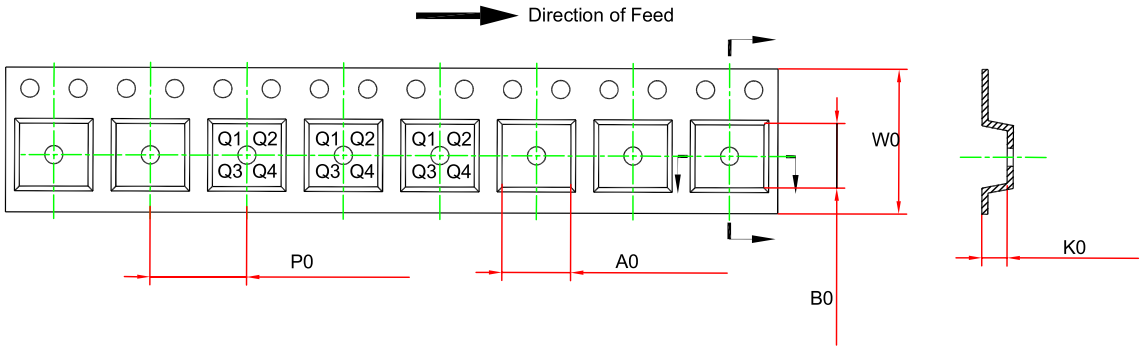


Figure 2. Typical Application Circuit

Tape and Reel Information





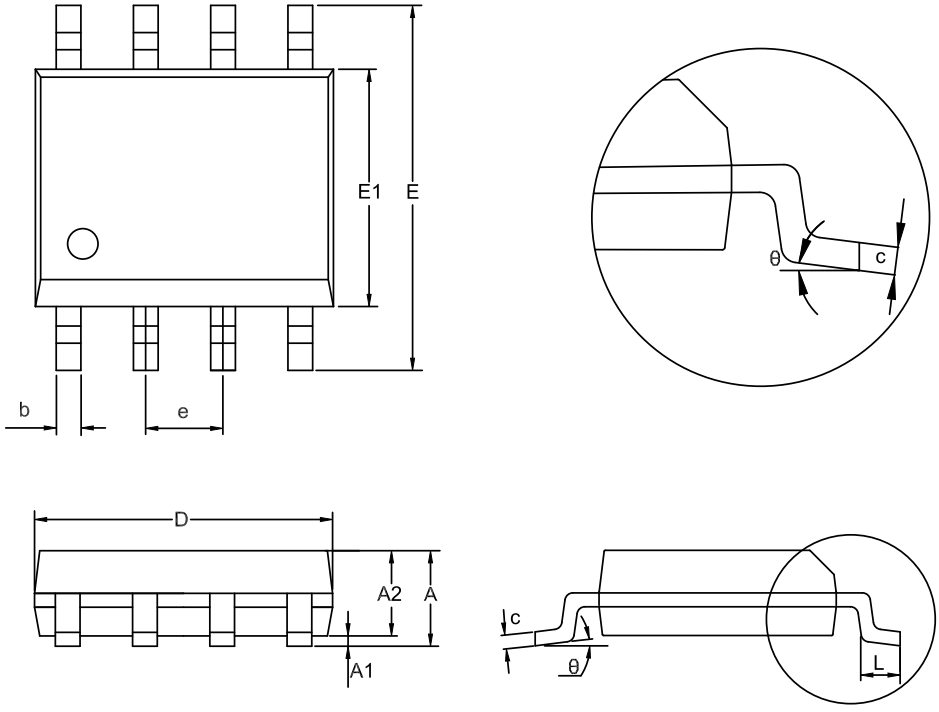


Order Number	Package	D1 (mm)	W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	W0 (mm)	Pin1 Quadrant
TPT1255-SO1R	SOP8	330.0	17.6	6.4	5.4	2.1	8.0	12.0	Q1
TPT1256-SO1R	SOP8	330.0	17.6	6.4	5.4	2.1	8.0	12.0	Q1
TPT1255-DF6R	DFN3X3-8	330.0	17.6	3.3	3.3	1.1	8.0	12.0	Q1
TPT1256-DF6R	DFN3X3-8	330.0	17.6	3.3	3.3	1.1	8.0	12.0	Q1

Package Outline Dimensions

SOP8

Package Outline Dimensions SO1(SOP-8-A)



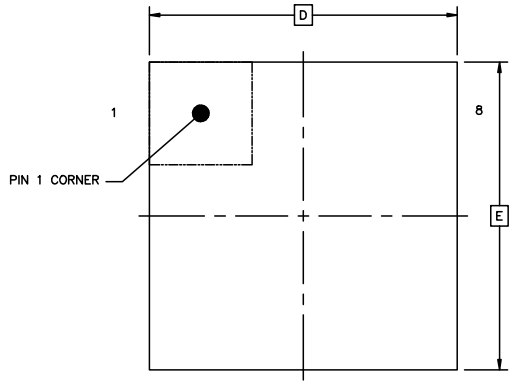
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.069
A1	0.050	0.250	0.002	0.010
A2	1.250	1.550	0.049	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
e	1.270 BSC		0.050 BSC	
L	0.400	1.000	0.016	0.039
θ	0	8°	0	8°

NOTES

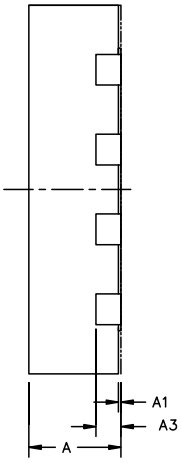
1. Do not include mold flash or protrusion.
2. This drawing is subject to change without notice.

DFN3X3-8

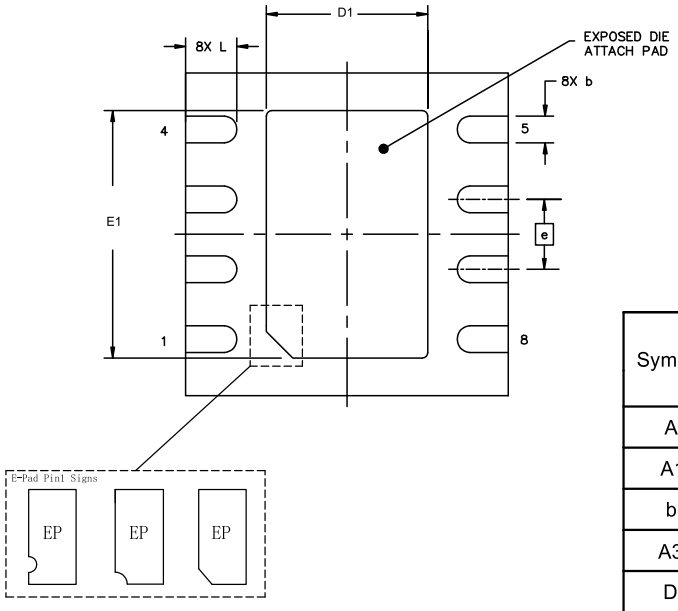
Package Outline Dimensions DF6(DFN3X3-8-A)



TOP VIEW



SIDE VIEW



BOTTOM VIEW

NOTES

1. Do not include mold flash or protrusion.
2. This drawing is subject to change without notice.
3. The many types of E-pad Pin1 signs may appear in the product.

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
b	0.200	0.350	0.008	0.014
A3	0.150	0.250	0.006	0.010
D	2.900	3.100	0.114	0.122
D1	1.400	1.600	0.055	0.063
E	2.900	3.100	0.114	0.122
E1	2.200	2.400	0.087	0.094
e	0.650 BSC		0.026 BSC	
L	0.224	0.575	0.009	0.023

Order Information

Order Number	Operating Temperature Range	Package	Marking Information	MSL	Transport Media, Quantity	Eco Plan
TPT1255-SO1R	−40 to 125°C	SOP8	T1255	MSL3	Tape and Reel, 4000	Green
TPT1256-SO1R	−40 to 125°C	SOP8	T1256	MSL3	Tape and Reel, 4000	Green
TPT1255-DF6R	−40 to 125°C	DFN8	1255	MSL3	Tape and Reel, 4000	Green
TPT1256-DF6R	−40 to 125°C	DFN8	1256	MSL3	Tape and Reel, 4000	Green

Green: 3PEAK defines "Green" to mean RoHS compatible and free of halogen substances.

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