SGLS143B – DECEMBER 2002 – REVISED JUNE 2008

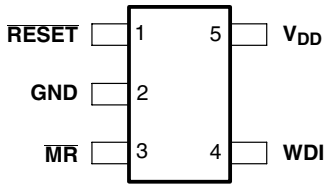
FEATURES

- Qualified for Automotive Applications
- ESD Protection Exceeds 2000 V Per MIL-STD-883, Method 3015; Using Human Body Model (C = 100 pF, R = 1500 Ω)
- Power-On Reset Generator With Fixed Delay Time of 200 ms (TPS3823/4/5/8) or 25 ms (TPS3820)
- Manual Reset Input (TPS3820/3/5/8)
- Reset Output Available in Active-Low (TPS3820/3/4/5), Active-High (TPS3824) and Open-Drain (TPS3828)
- Supply Voltage Supervision Range 2.5 V, 3 V, 3.3 V, 5 V
- Watchdog Timer (TPS3820/3/4/8)
- Supply Current of 15 μA (Typ)
- SOT23-5 Package

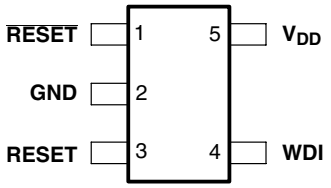
APPLICATIONS

- Applications Using Automotive DSPs, Microcontrollers, or Microprocessors
- Industrial Equipment
- Programmable Controls
- Automotive Systems
- Battery-Powered Equipment
- Intelligent Instruments
- Wireless Communications Systems

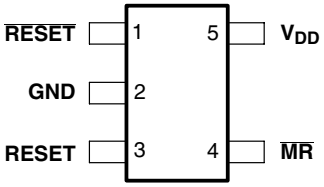
TPS3820, TPS3823, TPS3828 . . . DBV PACKAGE
(TOP VIEW)



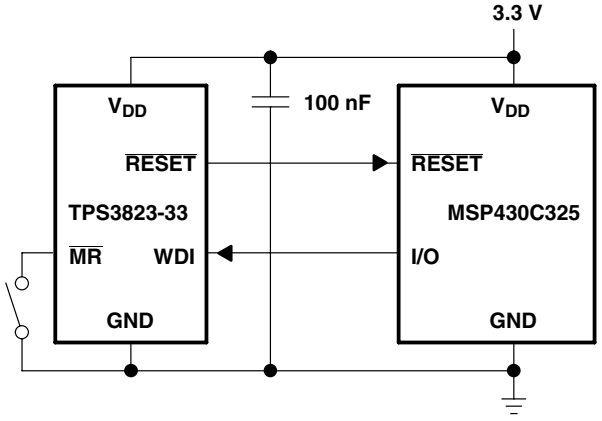
TPS3824 . . . DBV PACKAGE
(TOP VIEW)



TPS3825 . . . DBV PACKAGE
(TOP VIEW)



typical application



description

The TPS382x family of supervisors provides circuit initialization and timing supervision, primarily for DSP and processor-based systems.



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description (continued)

During power-on, $\overline{\text{RESET}}$ is asserted when supply voltage V_{DD} becomes higher than 1.1 V. Thereafter, the supply voltage supervisor monitors V_{DD} and keeps $\overline{\text{RESET}}$ active as long as V_{DD} remains below the threshold voltage V_{IT-}. An internal timer delays the return of the output to the inactive state (high) to ensure proper system reset. The delay time, t_d, starts after V_{DD} has risen above the threshold voltage V_{IT-}. When the supply voltage drops below the threshold voltage V_{IT-}, the output becomes active (low) again. No external components are required. All the devices of this family have a fixed-sense threshold voltage V_{IT-} set by an internal voltage divider.

The TPS3820/3/5/8 devices incorporate a manual reset input, $\overline{\text{MR}}$. A low level at $\overline{\text{MR}}$ causes $\overline{\text{RESET}}$ to become active. The TPS3824/5 devices include a high-level output RESET. TPS3820/3/4/8 have a watchdog timer that is periodically triggered by a positive or negative transition at WDI. When the supervising system fails to retrigger the watchdog circuit within the time-out interval, t_{tout}, $\overline{\text{RESET}}$ becomes active for the time period t_d. This event also reinitializes the watchdog timer. Leaving WDI unconnected disables the watchdog.

In applications where the input to the WDI pin may be active (transitioning high and low) when the TPS3820/3/4/8 is asserting $\overline{\text{RESET}}$, the TPS3820/3/4/8 does not return to a non-reset state when the input voltage is above Vt. If the application requires that input to WDI is active when $\overline{\text{RESET}}$ is asserted, WDI must be decoupled from the active signal. This can be accomplished by using an N-channel FET in series with the WDI pin, with the gate of the FET connected to the $\overline{\text{RESET}}$ output as shown in Figure 1.

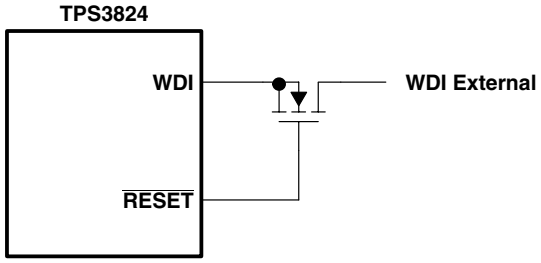


Figure 1

The product spectrum is designed for supply voltages of 2.5 V, 3 V, 3.3 V, and 5 V. The circuits are available in a 5-pin SOT23-5 package. The TPS382x-xxQ devices are characterized for operation over a temperature range of –40°C to 125°C, and are qualified in accordance with AEC-Q100 stress test qualification for integrated circuits.

PACKAGE INFORMATION†‡

DEVICE NAME	THRESHOLD VOLTAGE	MARKING
TPS3820-33QDBVRQ1§	2.93 V	PDEQ
TPS3820-50QDBVRQ1§	4.55 V	PDDQ
TPS3823-25QDBVRQ1§	2.25 V	PAPQ
TPS3823-30QDBVRQ1§	2.63 V	PAQQ
TPS3823-33QDBVRQ1§	2.93 V	PARQ
TPS3823-50QDBVRQ1§	4.55 V	PASQ
TPS3824-25QDBVRQ1§	2.25 V	PATQ
TPS3824-30QDBVRQ1§	2.63 V	PAUQ
TPS3824-33QDBVRQ1§	2.93 V	PAVQ
TPS3824-50QDBVRQ1§	4.55 V	PAWQ
TPS3825-33QDBVRQ1§	2.93 V	PDGQ
TPS3825-50QDBVRQ1§	4.55 V	PDFQ
TPS3828-33QDBVRQ1§	2.93 V	PDIQ
TPS3828-50QDBVRQ1§	4.55 V	PDHQ

† For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI web site at http://www.ti.com.

‡ Package drawings, thermal data, and symbolization are available at http://www.ti.com/packaging.

§ The DBVR package indicates tape and reel of 3000 parts.

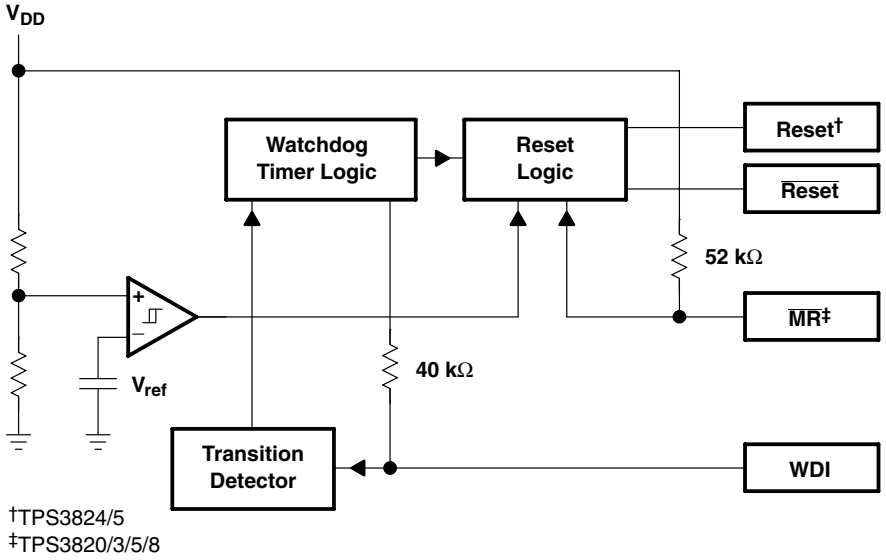
FUNCTION/TRUTH TABLE

INPUTS		OUTPUTS	
$\overline{MR}$‡	$V_{DD}>V_{IT}$	$\overline{RESET}$	RESET§
L	0	L	H
L	1	L	H
H	0	L	H
H	1	H	L

‡ TPS3820/3/5/8

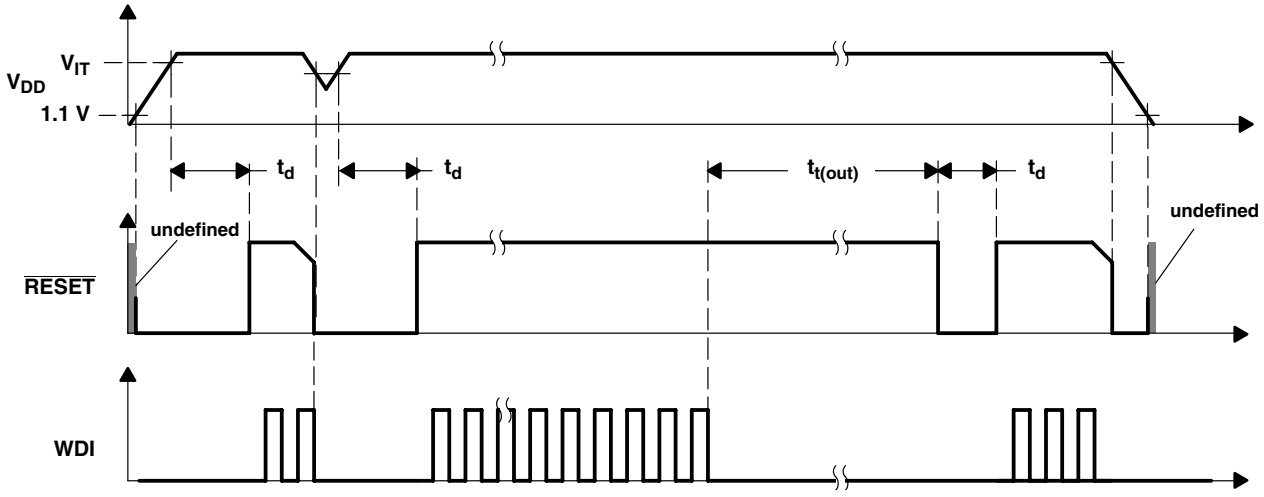
§ TPS3824/5

functional block diagram



†TPS3824/5
‡TPS3820/3/5/8

timing diagram



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage, V_{DD} (see Note 1) . . . . . 6 V
RESET, $\overline{\text{RESET}}$, $\overline{\text{MR}}$, WDI (see Note 1) . . . . . –0.3 V to (V_{DD} + 0.3 V)
Maximum low output current, I_{OL} . . . . . 5 mA
Maximum high output current, I_{OH} . . . . . –5 mA
Input clamp current range, I_{IK} ($V_I < 0$ or $V_I > V_{DD}$) . . . . . ±10 mA
Output clamp current range, I_{OK} ($V_O < 0$ or $V_O > V_{DD}$) . . . . . ±10 mA
Continuous total power dissipation . . . . . See Dissipation Rating Table
Operating free-air temperature range, T_A . . . . . –40°C to 125°C
Storage temperature range, T_{stg} . . . . . –65°C to 150°C
Soldering temperature . . . . . 260°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: All voltage values are with respect to GND.

DISSIPATION RATING TABLE

PACKAGE	$T_A \le 25°C$ POWER RATING	OPERATING FACTOR ABOVE $T_A = 25°C$	$T_A = 70°C$ POWER RATING	$T_A = 85°C$ POWER RATING	$T_A = 125°C$ POWER RATING
DBV	437 mW	3.5 mW/°C	280 mW	227 mW	87 mW

recommended operating conditions

	MIN	MAX	UNIT
Supply voltage, V_{DD}	1.1	5.5	V
Input voltage, V_I	0	V_{DD} + 0.3	V
High-level input voltage at $\overline{\text{MR}}$ and WDI, V_{IH}	0.7 × V_{DD}		V
Low-level input voltage, V_{IL}		0.3 × V_{DD}	V
Input transition rise and fall rate at $\overline{\text{MR}}$ or WDI, $\Delta t/\Delta V$		100	ns/V
Operating free-air temperature range, T_A	–40	125	°C

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER				TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{OH}	High-level output voltage	$\overline{\text{RESET}}$	TPS382x-25	$V_{DD} = V_{IT-} + 0.2$ V, $I_{OH} = -20$ µA	$0.8 \times V_{DD}$			V
			TPS382x-30 TPS382x-33	$V_{DD} = V_{IT-} + 0.2$ V, $I_{OH} = -30$ µA				
			TPS382x-50	$V_{DD} = V_{IT-} + 0.2$ V, $I_{OH} = -120$ µA	$V_{DD} - 1.5$ V			
		RESET	TPS3824-25 TPS3825-25	$V_{DD} \geq 1.8$ V, $I_{OH} = -100$ µA	$0.8 \times V_{DD}$			V
			TPS3824-30 TPS3825-30	$V_{DD} \geq 1.8$ V, $I_{OH} = -150$ µA				
			TPS3824-33 TPS3825-33					
			TPS3824-50 TPS3825-50					
V_{OL}	Low-level output voltage	RESET	TPS3824-25 TPS3825-25	$V_{DD} = V_{IT-} + 0.2$ V, $I_{OL} = 1$ mA			0.4	V
			TPS3824-30 TPS3825-30	$V_{DD} = V_{IT-} + 0.2$ V, $I_{OL} = 1.2$ mA				
			TPS3824-33 TPS3825-33					
			TPS3824-50 TPS3825-50	$V_{DD} = V_{IT-} + 0.2$ V, $I_{OL} = 3$ mA				
		$\overline{\text{RESET}}$	TPS382x-25	$V_{DD} = V_{IT-} - 0.2$ V, $I_{OL} = 1$ mA			0.45	V
			TPS382x-30 TPS382x-33	$V_{DD} = V_{IT-} - 0.2$ V, $I_{OL} = 1.2$ mA				
			TPS382x-50	$V_{DD} = V_{IT-} - 0.2$ V, $I_{OL} = 3$ mA				
	Power-up reset voltage (see Note 2)			$V_{DD} \geq 1.1$ V, $I_{OL} = 20$ µA			0.4	V
V_{IT-}	Negative-going input threshold voltage (see Note 3)		TPS382x-25	$T_A = 0°C$ to $85°C$	2.21	2.25	2.30	V
			TPS382x-30		2.59	2.63	2.69	
			TPS382x-33		2.88	2.93	3	
			TPS382x-50		4.49	4.55	4.64	
			TPS382x-25	$T_A = -40°C$ to $125°C$	2.19	2.25	2.30	V
			TPS382x-30		2.55	2.63	2.69	
			TPS382x-33		2.84	2.93	3	
			TPS382x-50		4.44	4.55	4.65	
V_{hys}	Hysteresis at V_{DD} input		TPS382x-25			30		mV
			TPS382x-30					
			TPS382x-33					
			TPS382x-50			50		

NOTES: 2. The lowest supply voltage at which $\overline{\text{RESET}}$ becomes active. $t_{r,\ VDD} \geq 15$ µs/V
3. To ensure best stability of the threshold voltage, a bypass capacitor (ceramic, 0.1 µF) should be placed near the supply terminals.

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted) (continued)

PARAMETER				TEST CONDITIONS	MIN	TYP	MAX	UNIT
$I_{IH(AV)}$	Average high-level input current		WDI	WDI = V_{DD}, time average (dc = 88%)		120		µA
$I_{IL(AV)}$	Average low-level input current		WDI	WDI = 0.3 V, V_{DD} = 5.5 V time average (dc = 12%)		–15		µA
I_{IH}	High-level input current		WDI	WDI = V_{DD}		140	190	µA
			$\overline{MR}$	$\overline{MR}$ = V_{DD} × 0.7, V_{DD} = 5.5 V		–40	–60	µA
I_{IL}	Low-level input current		WDI	WDI = 0.3 V, V_{DD} = 5.5 V		140	190	µA
			$\overline{MR}$	$\overline{MR}$ = 0.3 V, V_{DD} = 5.5 V		–110	–160	µA
I_{OS}	Output short-circuit current (see Note 4)	$\overline{RESET}$	TPS382x-25	V_{DD} = $V_{IT, max}$ + 0.2 V, V_O = 0 V			–400	µA
			TPS382x-30				–400	µA
			TPS382x-33				–400	µA
			TPS382x-50				–800	µA
I_{DD}	Supply current			WDI and $\overline{MR}$ unconnected, Outputs unconnected		15	25	µA
	Internal pullup resistor at $\overline{MR}$					52		kΩ
C_i	Input capacitance at $\overline{MR}$, WDI			V_I = 0 V to 5.5 V		5		pF

NOTE 4: The $\overline{RESET}$ short-circuit current is the maximum pullup current when $\overline{RESET}$ is driven low by a µP bidirectional reset pin.

timing requirements at R_L = 1 MΩ, C_L = 50 pF, T_A = 25°C

PARAMETER			TEST CONDITIONS	MIN	MAX	UNIT
t_w	Pulse width	at V_{DD}	V_{DD} = V_{IT-} + 0.2 V, V_{DD} = V_{IT-} - 0.2 V	6		µs
		at $\overline{MR}$	$V_{DD} \geq V_{IT-}$ + 0.2 V, V_{IL} = 0.3 x V_{DD}, V_{IH} = 0.7 x V_{DD}	1		µs
		at WDI	$V_{DD} \geq V_{IT-}$ + 0.2 V, V_{IL} = 0.3 x V_{DD}, V_{IH} = 0.7 x V_{DD}	100		ns

switching characteristics at R_L = 1 MΩ, C_L = 50 pF, T_A = 25°C

PARAMETER			TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{tout}	Watchdog time out	TPS3820	$V_{DD} \geq V_{IT-}$ + 0.2 V, See Timing Diagram	112	200	310	ms
		TPS3823/4/8		0.9	1.6	2.5	s
t_d	Delay time	TPS3820	$V_{DD} \geq V_{IT-}$ + 0.2 V, See timing diagram	15	25	37	ms
		TPS3823/4/5/8		120	200	300	ms
t_{PHL}	Propagation (delay) time, high-to-low-level output	$\overline{MR}$ to $\overline{RESET}$ delay (TPS3820/3/5/8)	$V_{DD} \geq V_{IT-}$ + 0.2 V, V_{IL} = 0.3 x V_{DD}, V_{IH} = 0.7 x V_{DD}			0.1	µs
		V_{DD} to $\overline{RESET}$ delay	V_{IL} = V_{IT-} - 0.2 V, V_{IH} = V_{IT-} + 0.2 V			25	µs
t_{PLH}	Propagation (delay) time, low-to-high-level output	$\overline{MR}$ to RESET delay (TPS3824/5)	$V_{DD} \geq V_{IT-}$ + 0.2 V, V_{IL} = 0.3 x V_{DD}, V_{IH} = 0.7 x V_{DD}			0.1	µs
		V_{DD} to RESET delay (TPS3824/5)	V_{IL} = V_{IT-} - 0.2 V, V_{IH} = V_{IT-} + 0.2 V			25	µs

TYPICAL CHARACTERISTICS

NORMALIZED INPUT THRESHOLD VOLTAGE vs FREE-AIR TEMPERATURE AT V_{DD}

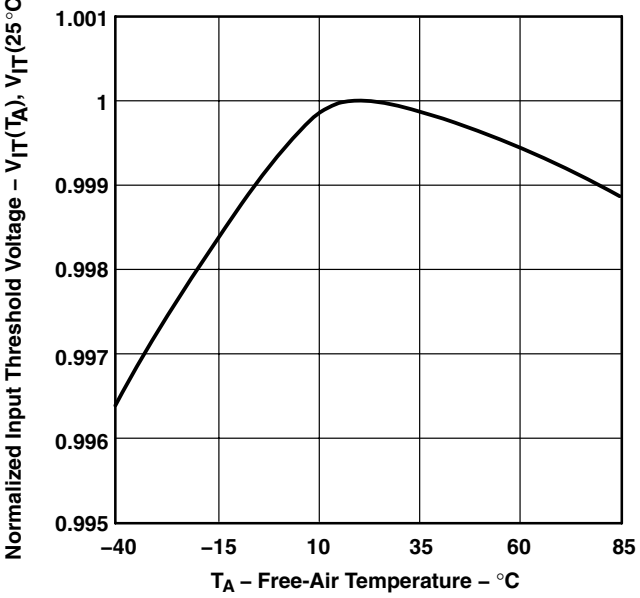


Figure 2

SUPPLY CURRENT vs SUPPLY VOLTAGE

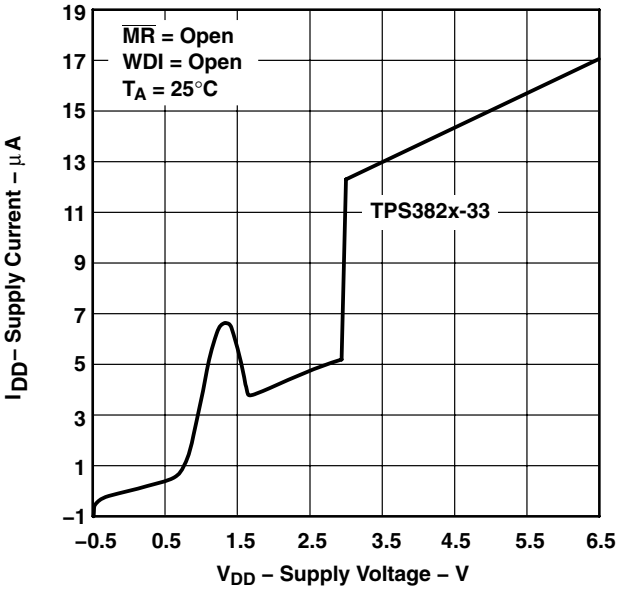


Figure 3

INPUT CURRENT vs INPUT VOLTAGE AT $\overline{MR}$

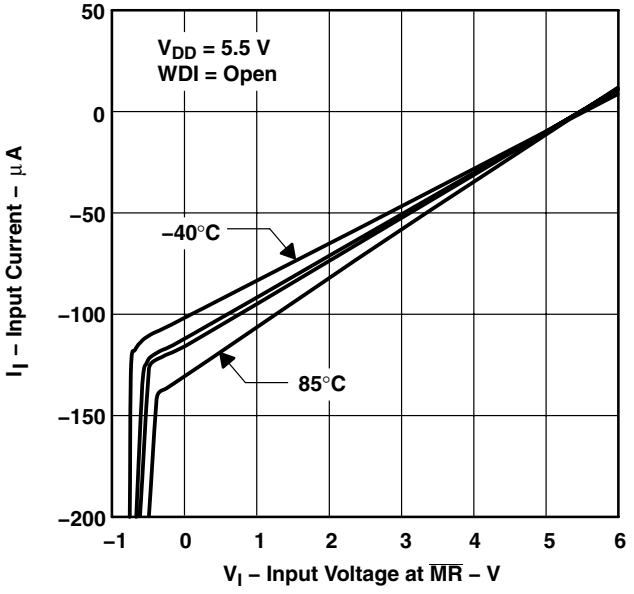


Figure 4

LOW-LEVEL OUTPUT VOLTAGE vs LOW-LEVEL OUTPUT CURRENT

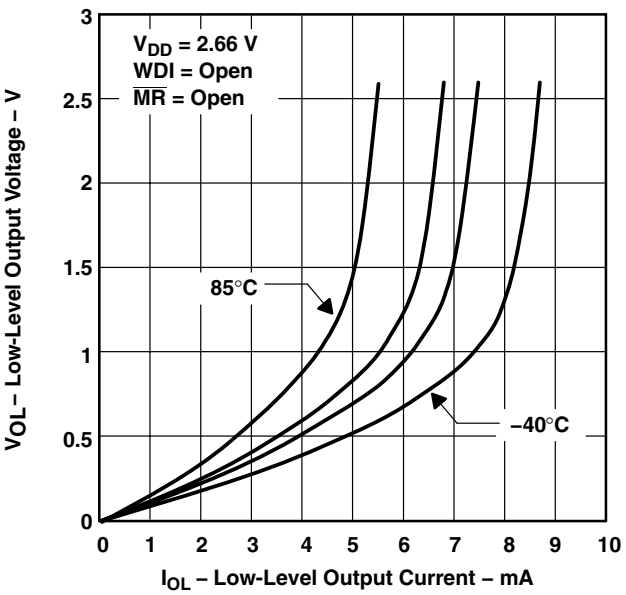


Figure 5

TYPICAL CHARACTERISTICS

HIGH-LEVEL OUTPUT VOLTAGE vs HIGH-LEVEL OUTPUT CURRENT

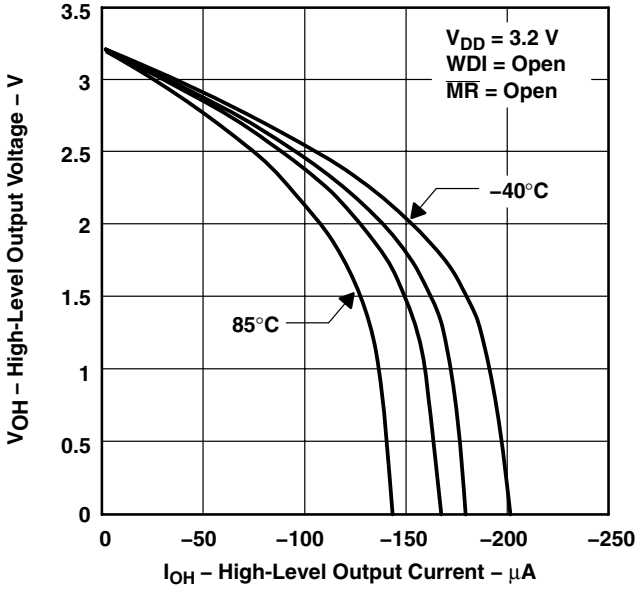


Figure 6

HIGH-LEVEL OUTPUT VOLTAGE vs HIGH-LEVEL OUTPUT CURRENT

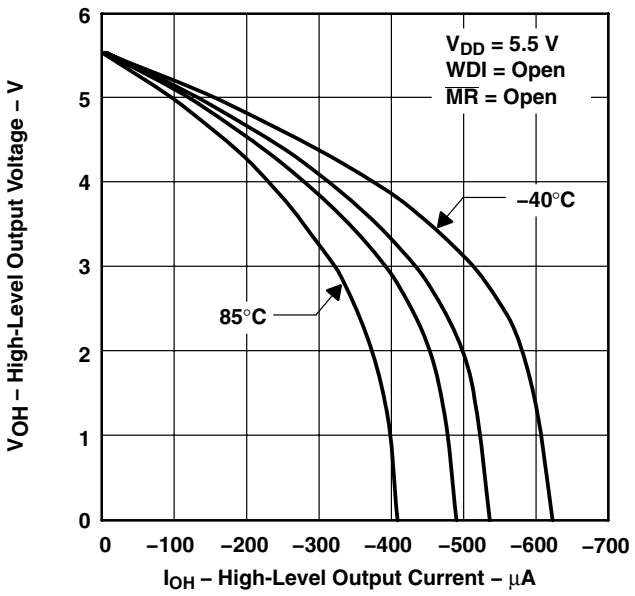


Figure 7

MINIMUM PULSE DURATION AT V_{DD} vs V_{DD} THRESHOLD OVERDRIVE

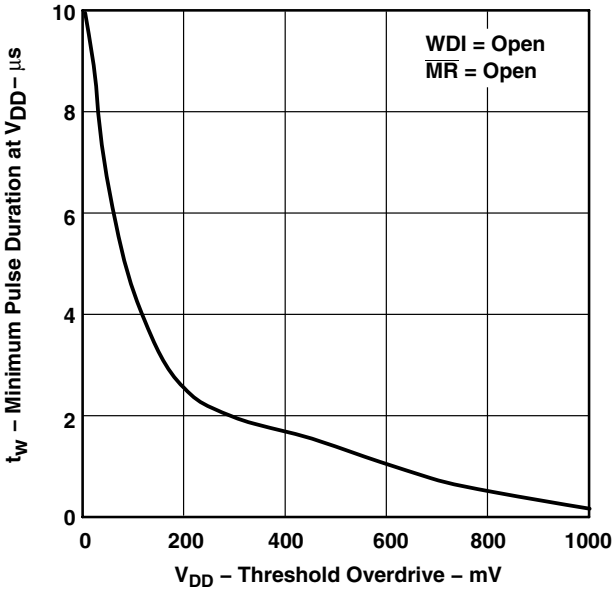


Figure 8

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Top-Side Markings (4)	Samples
2T25-50QFRG4Q1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PDFQ	Samples
2T28-33QDBVRG4Q1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PDIQ	Samples
2U3820-50QDBVRG4Q1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PDDQ	Samples
2U3823-25QDBVRG4Q1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PAPQ	Samples
2U3823-30QDBVRG4Q1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PAQQ	Samples
2U3823-33QDBVRG4Q1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PARQ	Samples
2U3823-50QDBVRG4Q1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PASQ	Samples
2U3824-25QDBVRG4Q1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PATQ	Samples
2U3824-33QDBVRG4Q1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PAVQ	Samples
2U3824-50QDBVRG4Q1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PAWQ	Samples
2U3825-33QDBVRG4Q1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PDGQ	Samples
TPS3820-33QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PDEQ	Samples
TPS3820-50DBVRQ1G4	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PKG4	Samples
TPS3820-50QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PDDQ	Samples
TPS3823-25QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PAPQ	Samples
TPS3823-30QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PAQQ	Samples
TPS3823-33QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PARQ	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Top-Side Markings (4)	Samples
TPS3823-50QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PASQ	Samples
TPS3824-25QDBVRQ1	OBSOLETE	SOT-23	DBV	5		TBD	Call TI	Call TI	-40 to 125		
TPS3824-30QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PAUQ	Samples
TPS3824-33QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PAVQ	Samples
TPS3824-50QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PAWQ	Samples
TPS3825-33QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PDGQ	Samples
TPS3825-50QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PDFQ	Samples
TPS3828-33QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PDIQ	Samples
TPS3828-50QDBVRG4Q	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PDHQ	Samples
TPS3828-50QDBVRQ1	ACTIVE	SOT-23	DBV	5	3000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 125	PDHQ	Samples

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) Only one of markings shown within the brackets will appear on the physical device.

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OTHER QUALIFIED VERSIONS OF TPS3820-33-Q1, TPS3820-50-Q1, TPS3823-25-Q1, TPS3823-30-Q1, TPS3823-33-Q1, TPS3823-50-Q1, TPS3824-25-Q1, TPS3824-30-Q1, TPS3824-33-Q1, TPS3824-50-Q1, TPS3825-33-Q1, TPS3825-50-Q1, TPS3828-33-Q1, TPS3828-50-Q1 :

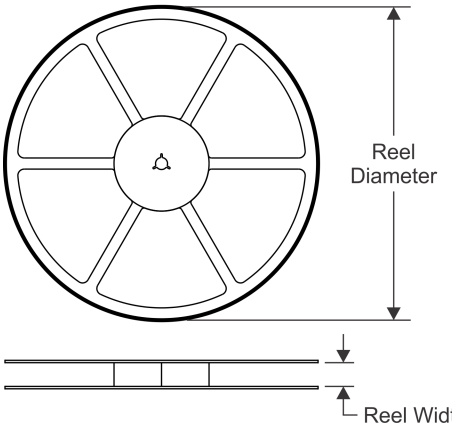
- Catalog: TPS3820-33, TPS3820-50, TPS3823-25, TPS3823-30, TPS3823-33, TPS3823-50, TPS3824-25, TPS3824-30, TPS3824-33, TPS3824-50, TPS3825-33, TPS3825-50, TPS3828-33, TPS3828-50

NOTE: Qualified Version Definitions:

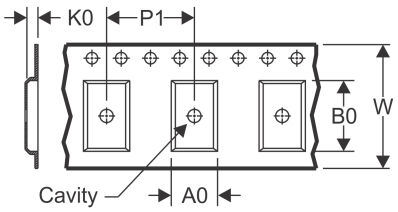
- Catalog - TI's standard catalog product

TAPE AND REEL INFORMATION

REEL DIMENSIONS

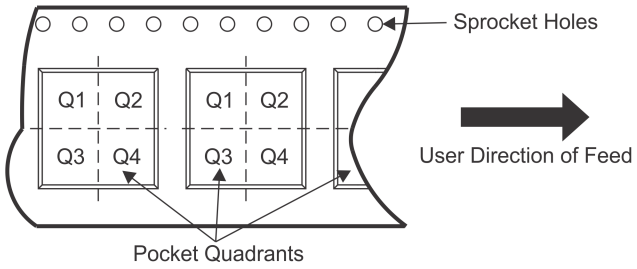


TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE

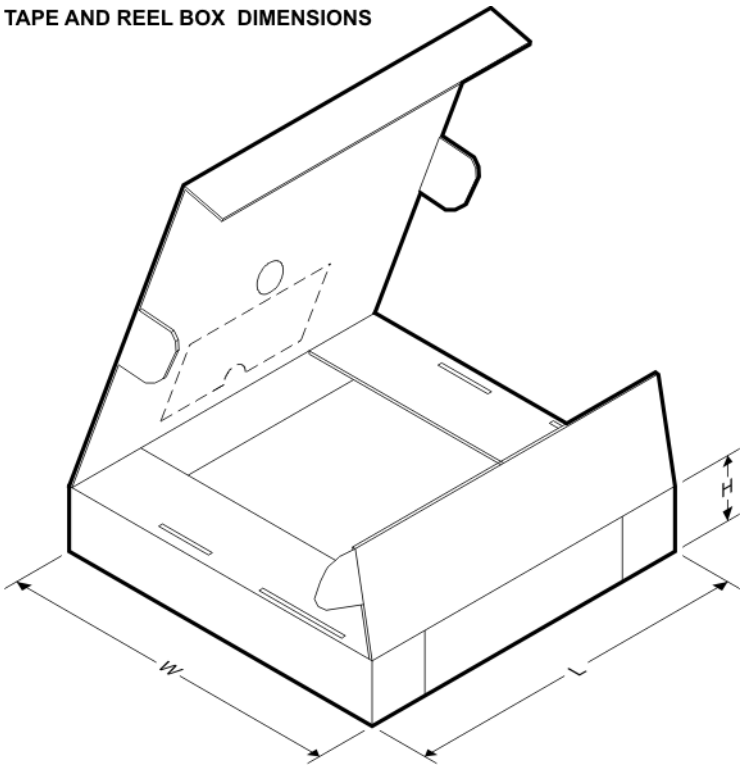


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
2T25-50QFRG4Q1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
2T28-33QDBVRG4Q1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
2U3820-50QDBVRG4Q1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
2U3823-25QDBVRG4Q1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
2U3823-30QDBVRG4Q1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
2U3823-33QDBVRG4Q1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
2U3823-50QDBVRG4Q1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
2U3824-25QDBVRG4Q1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
2U3824-33QDBVRG4Q1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
2U3824-50QDBVRG4Q1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
2U3825-33QDBVRG4Q1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3820-33QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3820-50DBVRQ1G4	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3820-50QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3823-25QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3823-30QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3823-33QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3823-50QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
TPS3824-30QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3824-33QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3824-50QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3825-33QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3825-50QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3828-33QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3828-50QDBVRG4Q	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3
TPS3828-50QDBVRQ1	SOT-23	DBV	5	3000	180.0	9.0	3.15	3.2	1.4	4.0	8.0	Q3

TAPE AND REEL BOX DIMENSIONS

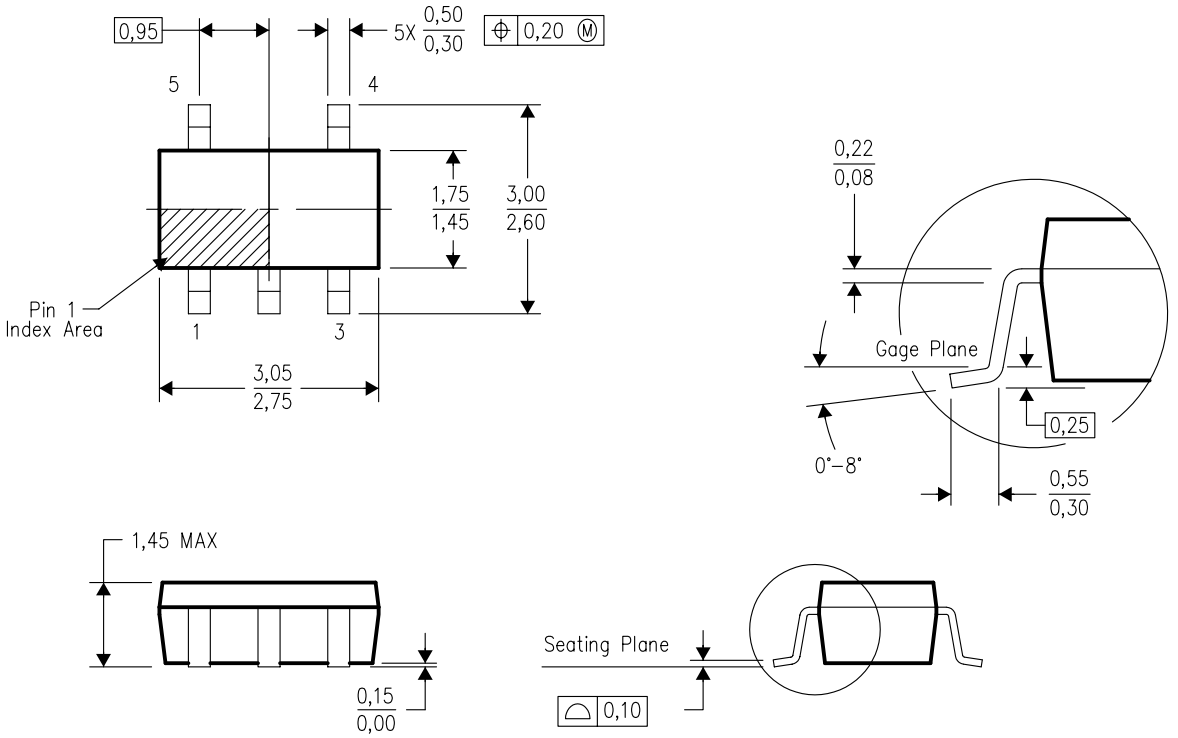


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
2T25-50QFRG4Q1	SOT-23	DBV	5	3000	182.0	182.0	20.0
2T28-33QDBVRG4Q1	SOT-23	DBV	5	3000	182.0	182.0	20.0
2U3820-50QDBVRG4Q1	SOT-23	DBV	5	3000	182.0	182.0	20.0
2U3823-25QDBVRG4Q1	SOT-23	DBV	5	3000	182.0	182.0	20.0
2U3823-30QDBVRG4Q1	SOT-23	DBV	5	3000	182.0	182.0	20.0
2U3823-33QDBVRG4Q1	SOT-23	DBV	5	3000	182.0	182.0	20.0
2U3823-50QDBVRG4Q1	SOT-23	DBV	5	3000	182.0	182.0	20.0
2U3824-25QDBVRG4Q1	SOT-23	DBV	5	3000	182.0	182.0	20.0
2U3824-33QDBVRG4Q1	SOT-23	DBV	5	3000	182.0	182.0	20.0

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
2U3824-50QDBVRG4Q1	SOT-23	DBV	5	3000	182.0	182.0	20.0
2U3825-33QDBVRG4Q1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3820-33QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3820-50DBVRQ1G4	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3820-50QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3823-25QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3823-30QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3823-33QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3823-50QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3824-30QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3824-33QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3824-50QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3825-33QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3825-50QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3828-33QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3828-50QDBVRG4Q	SOT-23	DBV	5	3000	182.0	182.0	20.0
TPS3828-50QDBVRQ1	SOT-23	DBV	5	3000	182.0	182.0	20.0

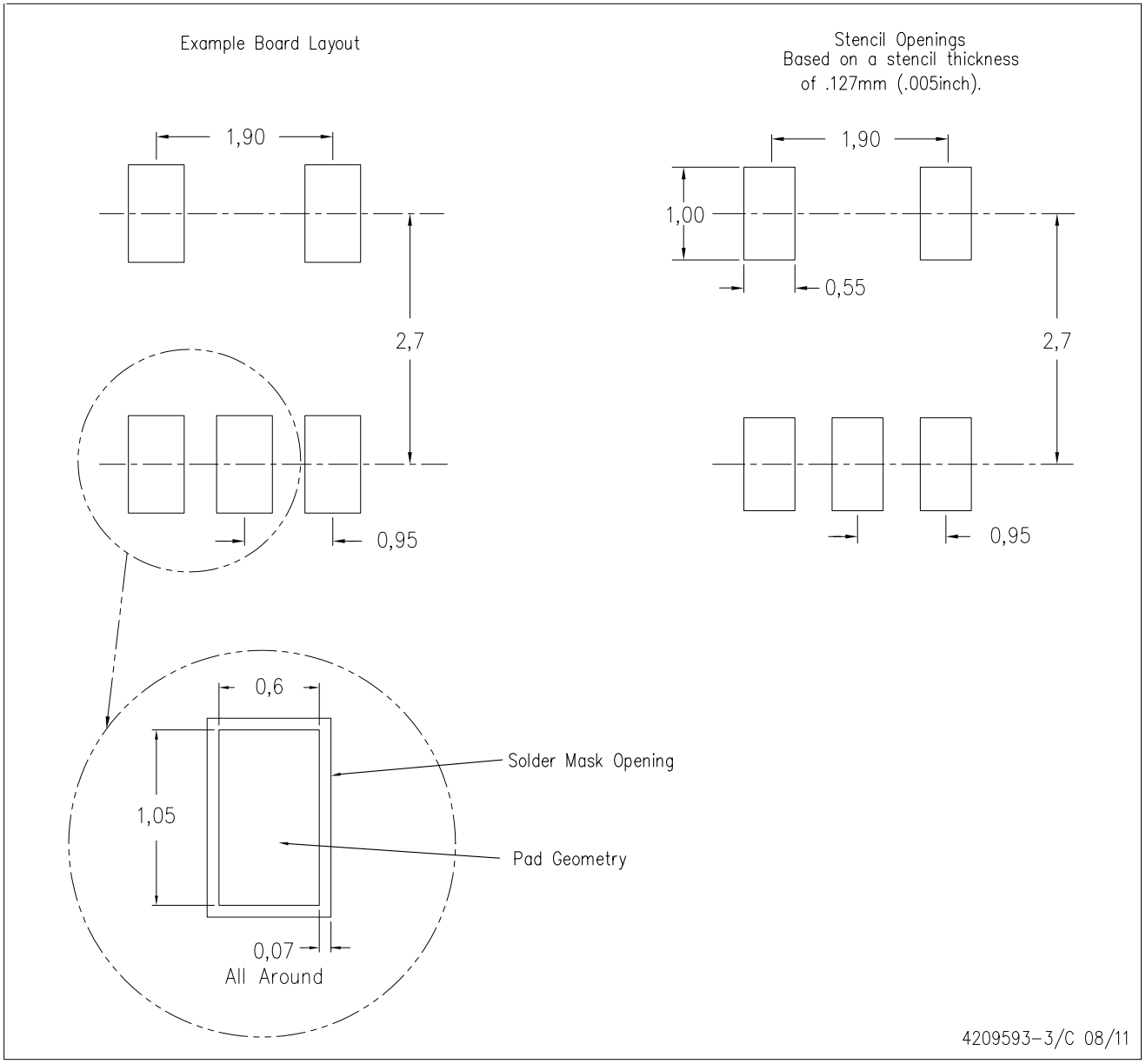
DBV (R–PDSO–G5) PLASTIC SMALL–OUTLINE PACKAGE



4073253–4/K 03/2006

NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion. Mold flash and protrusion shall not exceed 0.15 per side.
D. Falls within JEDEC MO–178 Variation AA.

DBV (R–PDSO–G5) PLASTIC SMALL OUTLINE



NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
D. Publication IPC–7351 is recommended for alternate designs.
E. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Example stencil design based on a 50% volumetric metal load solder paste. Refer to IPC–7525 for other stencil recommendations.

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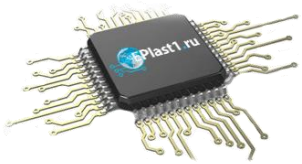
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- Поставка более 17-ти миллионов наименований электронных компонентов;
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