features

- Power-On Reset Generator with Fixed Delay Time of 200 ms, no External Capacitor Needed
- Precision Supply Voltage Monitor 2.5 V, 3 V, 3.3 V, and 5 V
- Pin-For-Pin Compatible with the MAX705 through MAX708 Series
- Integrated Watchdog Timer (TPS3705 only)
- Voltage Monitor for Power-Fail or Low-Battery Warning
- Maximum Supply Current of 50 μA
- MSOP-8 and SO-8 Packages
- Temperature Range . . . −40°C to 85°C

typical applications

- Designs Using DSPs, Microcontrollers or Microprocessors
- Industrial Equipment
- Programmable Controls
- Automotive Systems
- Portable/Battery Powered Equipment
- Intelligent Instruments
- Wireless Communication Systems
- Notebook/Desktop Computers

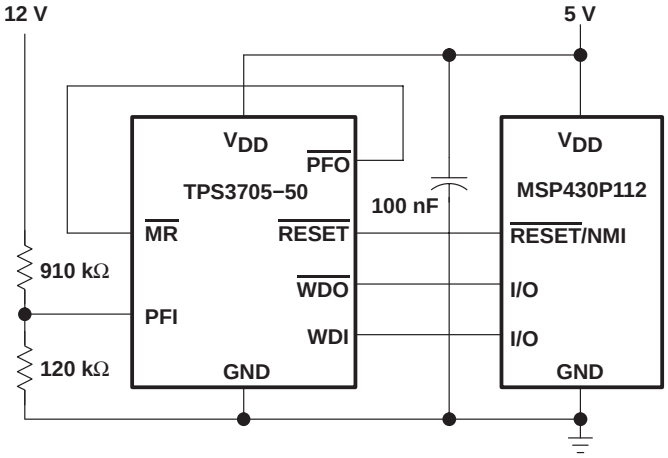
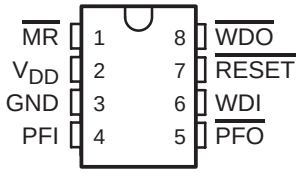
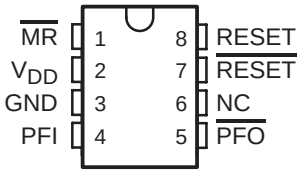


Figure 1. Typical MSP430 Application

TPS3705 . . . D PACKAGE
(TOP VIEW)

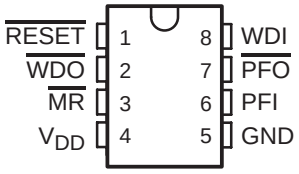


TPS3707 . . . D PACKAGE
(TOP VIEW)

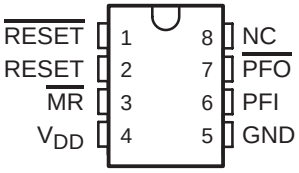


NC − No internal connection

TPS3705 . . . DGN PACKAGE
(TOP VIEW)



TPS3707 . . . DGN PACKAGE
(TOP VIEW)



NC − No internal connection

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description

The TPS3705, TPS3707 family of microprocessor supply-voltage supervisors provide circuit initialization and timing supervision, primarily for DSP and processor-based systems.

During power-on, $\overline{\text{RESET}}$ is asserted when the 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, $t_{d\,typ}$ = 200 ms, 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 TPS3705-xx and TPS3707-xx devices incorporate a manual reset input, $\overline{\text{MR}}$. A low level at $\overline{\text{MR}}$ causes $\overline{\text{RESET}}$ to become active.

The TPS370x-xx families integrate a power-fail comparator which can be used for low-battery detection, power-fail warning, or for monitoring a power supply other than the main supply.

The TPS3705-xx devices 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, $t_{t(out)}$ = 1.6 s, $\overline{\text{WDO}}$ becomes active. This event also reinitializes the watchdog timer. Leaving WDI unconnected disables the watchdog.

The TPS3707-xx devices do not have the Watchdog function, but include a high-level output RESET.

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 either 8-pin MSOP or standard SOIC packages. The TPS3705, TPS3707 devices are characterized for operation over a temperature range of −40°C to 85°C.

AVAILABLE OPTIONS

T_A	THRESHOLD VOLTAGE	PACKAGED DEVICES		MARKING DGN PACKAGE	CHIP FORM (Y)
		SMALL OUTLINE (D)	POWER−PAD™ μ-SMALL OUTLINE (DGN)		
−40°C to 85°C	2.63 V	TPS3705−30D	TPS3705−30DGN	TIAAT	TPS3705-30Y
	2.93 V	TPS3705−33D	TPS3705−33DGN	TIAAU	TPS3705−33Y
	4.55 V	TPS3705−50D	TPS3705−50DGN	TIAAV	TPS3705−50Y
	2.25 V	TPS3707−25D	TPS3707−25DGN	TIAAW	TPS3707−25Y
	2.63 V	TPS3707−30D	TPS3707−30DGN	TIAAX	TPS3707−30Y
	2.93 V	TPS3707−33D	TPS3707−33DGN	TIAAY	TPS3707−33Y
	4.55 V	TPS3707−50D	TPS3707−50DGN	TIAAZ	TPS3707−50Y

Function Tables

TRUTH TABLE, TPS3705

$\overline{MR}$	$V_{DD}>V_{IT}$	$\overline{RESET}$	TYPICAL DELAY
H→L	1	H→L	30 ns
L→H	1	L→H	200 ms
H	1→0	H→L	3 µs
H	0→1	L→H	200 ms

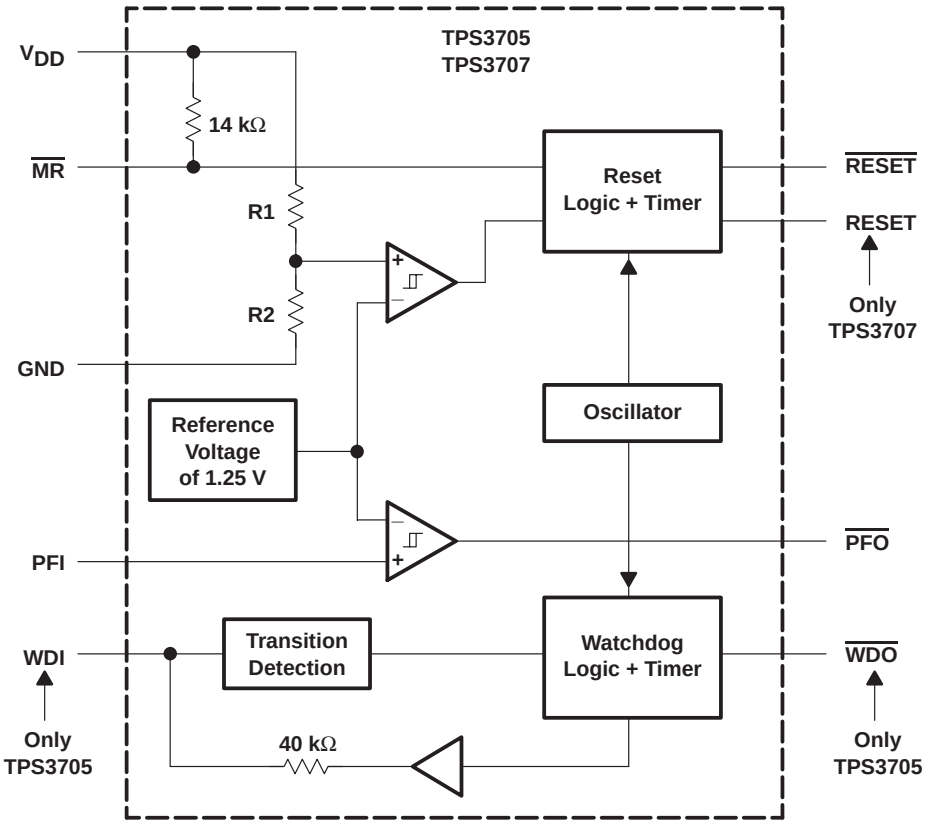
TRUTH TABLE, TPS3707

$\overline{MR}$	$V_{DD}>V_{IT}$	$\overline{RESET}$	RESET	TYPICAL DELAY
H→L	1	H→L	L→H	30 ns
L→H	1	L→H	H→L	200 ms
H	1→0	H→L	L→H	3 µs
H	0→1	L→H	H→L	200 ms

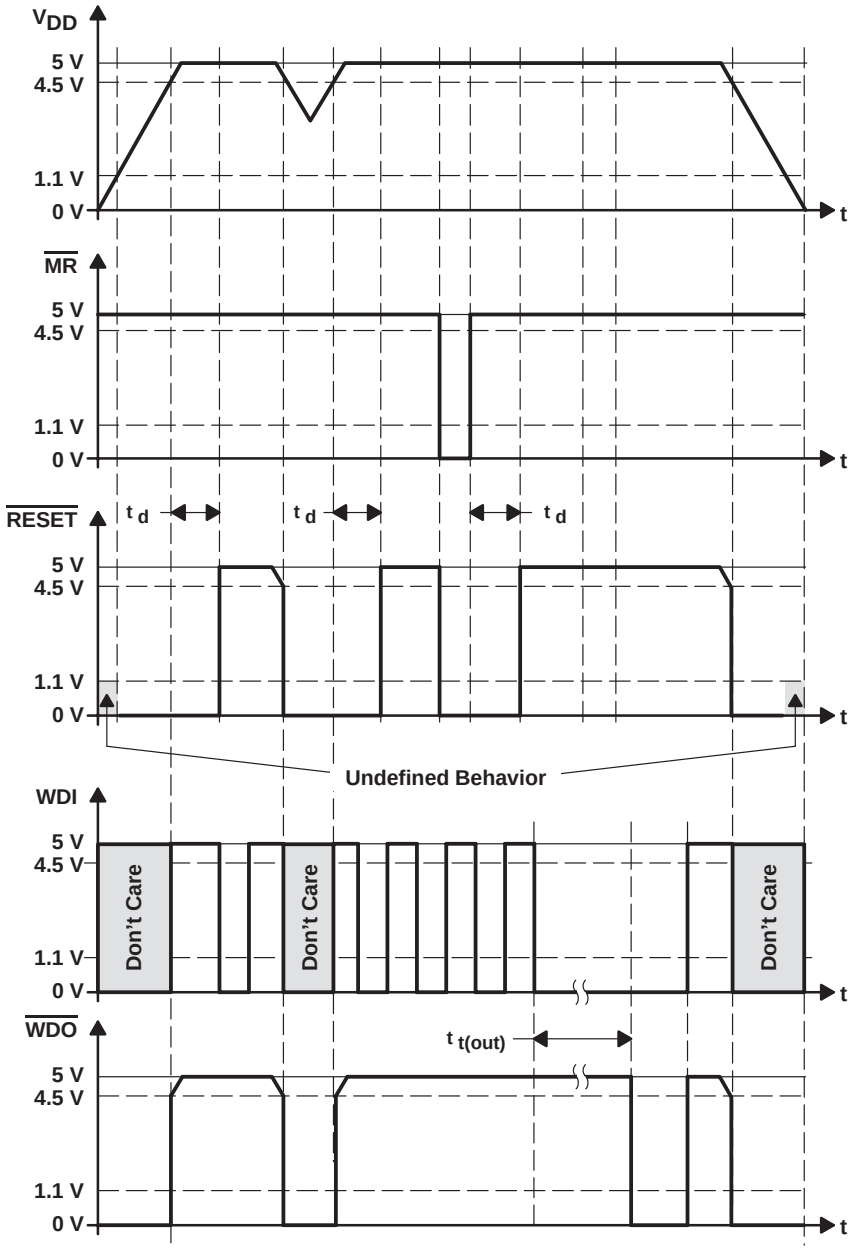
TRUTH TABLE, TPS370x

$PFI>V_{IT}$	$\overline{PFO}$	TYPICAL DELAY
0→1	L→H	0.5 µs
1→0	H→L	0.5 µs

functional block diagram



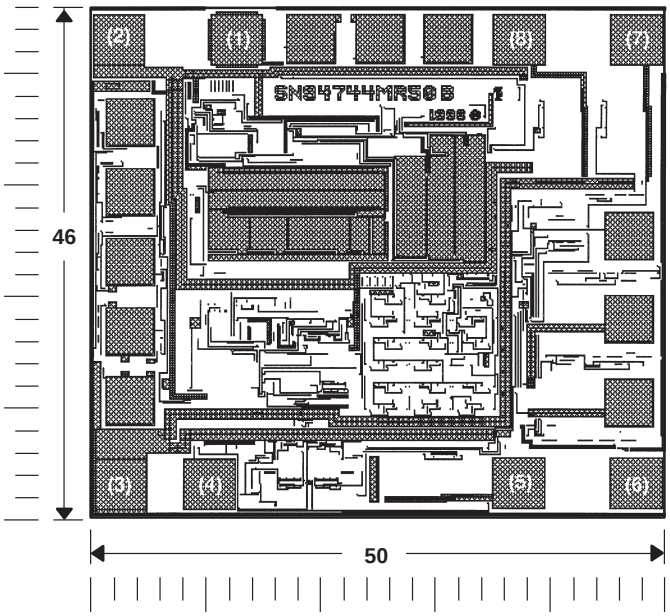
timing diagrams

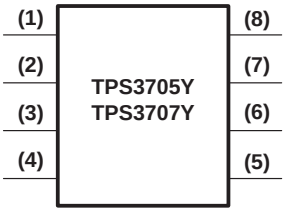


TPS370xY chip information

These chips, when properly assembled, display characteristics similar to those of the TPS370x. Thermal compression or ultrasonic bonding may be caused on the doped-aluminum bonding pads. The chips may be mounted with conductive epoxy or a gold-silicon preform.

BONDING PAD ASSIGNMENTS





CHIP THICKNESS: 10 MILS TYPICAL

BONDING PADS: 4 × 4 MINIMUM

T_J max = 150°C

TOLERANCES ARE ±10%

ALL DIMENSIONS ARE IN MILS

Terminal Functions

TERMINAL NAME		NO.	I/O	DESCRIPTION
$\overline{\text{MR}}$		1	I	Manual reset
VDD		2		Supply voltage
GND		3		Ground
PFI		4	I	Power-fail comparator input
$\overline{\text{PFO}}$		5	O	Power-fail comparator output
WDI	TPS3705	6	I	Watchdog timer input
NC	TPS3707			No internal connection
$\overline{\text{RESET}}$		7	O	Active-low reset output
$\overline{\text{WDO}}$	TPS3705	8	O	Watchdog timer output
RESET	TPS3707		O	Active-high reset output

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

Supply voltage, V_{DD} (see Note1) . . . . . 7 V
PFI voltage range, V_{PFI} . . . . . −0.3 V to V_{DD} + 0.3 V
All other pins (see Note 1) . . . . . −0.3 V to 7 V
Maximum low output current, I_{OL} . . . . . 5 mA
Maximum high output current, I_{OH} . . . . . −5 mA
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{DD}$) . . . . . ±20 mA
Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{DD}$) . . . . . ±20 mA
Continuous total power dissipation . . . . . See Dissipation Rating Table
Operating free-air temperature range, T_A . . . . . −40°C to 85°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. For reliable operation the device must not be operated at 7 V for more than t = 1000h continuously.

DISSIPATION RATING TABLE

PACKAGE	T_A <25°C POWER RATING	DERATING FACTOR ABOVE T_A = 25°C	T_A = 70°C POWER RATING	T_A = 85°C POWER RATING
DGN	2.14 W	17.1 mW/°C	1.37 W	1.11 W
D	725 mW	5.8 mW/°C	464 mW	377 mW

recommended operating conditions at specified temperature range

	MIN	MAX	UNIT
Supply voltage, V_{DD}	2	6	V
Input voltage, V_I	0	V_{DD}+0.3	V
High-level input voltage, 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 $\overline{MR}$ or WDI, $\Delta t/\Delta V$		100	ns/V
Operating free-air temperature range, T_A	−40	85	°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		TPS370x-xx	V_{DD} = 1.1 V, I_{OH} = −4 µA	0.8			V
			TPS3707-25	$V_{DD} = V_{IT+}$ + 0.2 V, I_{OH} = −500 µA	0.7×V_{DD}			
			TPS370x-30					
			TPS370x-33					
			TPS370x-50	$V_{DD} = V_{IT+}$ + 0.2 V, I_{OH} = −800 µA	V_{DD} −1.5 V			
			TPS370x-xx	V_{DD} = 6 V, I_{OH} = −800 µA				
V_{OL}	Low-level output voltage		TPS3707-25	$V_{DD} = V_{IT+}$+0.2 V, I_{OL} = 1 mA			0.3	V
			TPS370x-30					
			TPS370x-33					
			TPS370x-50	$V_{DD} = V_{IT+}$+0.2 V, I_{OL} = 2.5 mA			0.4	V
			TPS370x-xx	V_{DD} = 6 V, I_{OL} = 3 mA				
	Power-up reset voltage (see Note 2)			V_{DD} ≥ 1.1 V, I_{OL} = 50 µA			0.3	V
V_{IT-}	Negative-going input threshold voltage (see Note 3)		TPS3707-25	T_A = 0°C to 85°C	2.20	2.25	2.30	V
			TPS370x-30		2.57	2.63	2.68	
			TPS370x-33		2.87	2.93	2.98	
			TPS370x-50		4.45	4.55	4.63	
			TPS3707-25	T_A = −40°C to 85°C	2.20	2.25	2.32	V
			TPS370x-30		2.57	2.63	2.70	
			TPS370x-33		2.87	2.93	3.0	
			TPS370x-50		4.45	4.55	4.65	
		PFI	TPS370x-xx	V_{DD} ≥ 2 V, T_A = −40°C to 85°C	1.20	1.25	1.30	V
V_{hys}	Hysteresis	V_{DD}	TPS3707-25			40		mV
			TPS370x-30			50		
			TPS370x-33			50		
			TPS370x-50			70		
		PFI	TPS370x-xx			10		
$I_{IH(AV)}$	Average high-level input current	WDI		WDI = V_{DD} = 6 V, Time average (dc = 88%)		100	150	µA
$I_{IL(AV)}$	Average low-level input current			WDI = 0 V, V_{DD} = 6 V, Time average (dc = 12%)		−15	−20	µA
I_{IH}	High-level input current	WDI		WDI = V_{DD} = 6 V		120	170	µA
		$\overline{MR}$		$\overline{MR}$ = 0.7×V_{DD}, V_{DD} = 6 V		−130	−180	
I_{IL}	Low-level input current	WDI		WDI = 0 V, V_{DD} = 6 V		−120	−170	µA
		$\overline{MR}$		$\overline{MR}$ = 0 V, V_{DD} = 6 V		−430	−600	
I_I	Input current	PFI		V_{DD} = 6 V, 0 V ≤ V_I ≤ V_{DD}	−1	0	1	µA
I_{DD}	Supply current		TPS3707-xx	V_{DD} = 2 V to 6 V, $\overline{MR}$ = V_{DD}, $\overline{MR}$, WDI and outputs unconnected		20	50	µA
			TPS3705-xx	V_{DD} = 2 V to 6 V, $\overline{MR}$= V_{DD}, $\overline{MR}$, WDI and outputs unconnected		30	50	µA
C_i	Input capacitance			V_I = 0 V to V_{DD}		5		pF

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

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

PARAMETER			TEST CONDITIONS	MIN	TYP	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, $V_{IL} = 0.3 \times V_{DD}$, $V_{IH} = 0.7 \times V_{DD}$	100			ns
		at WDI	$V_{DD} \geq V_{IT+} + 0.2$ V, $V_{IL} = 0.3 \times V_{DD}$, $V_{IH} = 0.7 \times V_{DD}$	100			ns

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

PARAMETER			TEST CONDITIONS	MIN	TYP	MAX	UNIT
$t_{t(out)}$	Watchdog time out		$V_{DD} \geq V_{IT+} + 0.2$ V, See timing diagram	1.1	1.6	2.3	s
t_d	Delay time		$V_{DD} > V_{IT+} + 0.2$ V, See timing diagram	140	200	280	ms
t_{PHL}	Propagation (delay) time, high-to-low-level output	$\overline{MR}$ to $\overline{RESET}$ delay	$V_{DD} \geq V_{IT+} + 0.2$ V, $V_{IL} = 0.3 \times V_{DD}$ $V_{IH} = 0.7 \times V_{DD}$		50	250	ns
t_{PLH}	Propagation (delay) time, low-to-high-level output	$\overline{MR}$ to RESET delay (TPS3707−xx only)			50	250	
t_{PHL}	Propagation (delay) time, high-to-low-level output	V_{DD} to $\overline{RESET}$ delay			3	5	µs
t_{PLH}	Propagation (delay) time, low-to-high-level output	V_{DD} to RESET delay (TPS3707-xx only)			3	5	
t_{PHL}	Propagation (delay) time, high-to-low-level output	PFI to $\overline{PFO}$ delay	V_{DD} = 2 V to 6 V		0.5	1	µs
t_{PLH}	Propagation (delay) time, low-to-high-level output				0.5	1	

TYPICAL CHARACTERISTICS

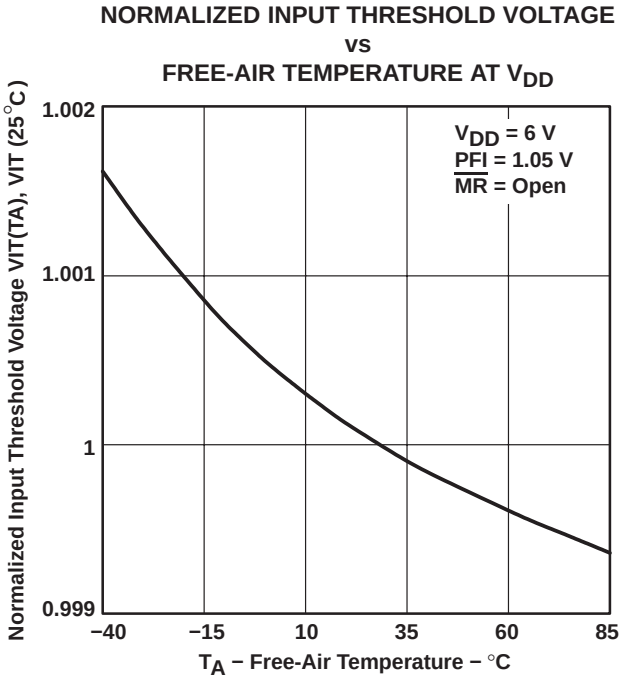


Figure 2

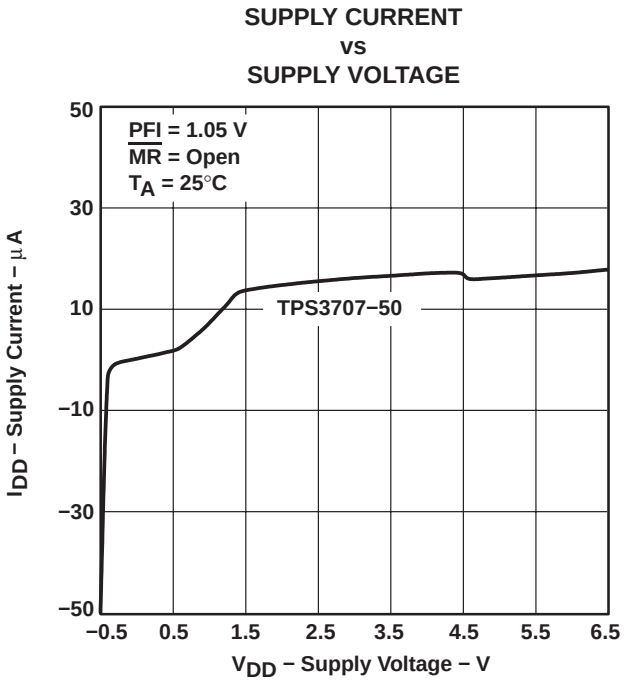


Figure 3

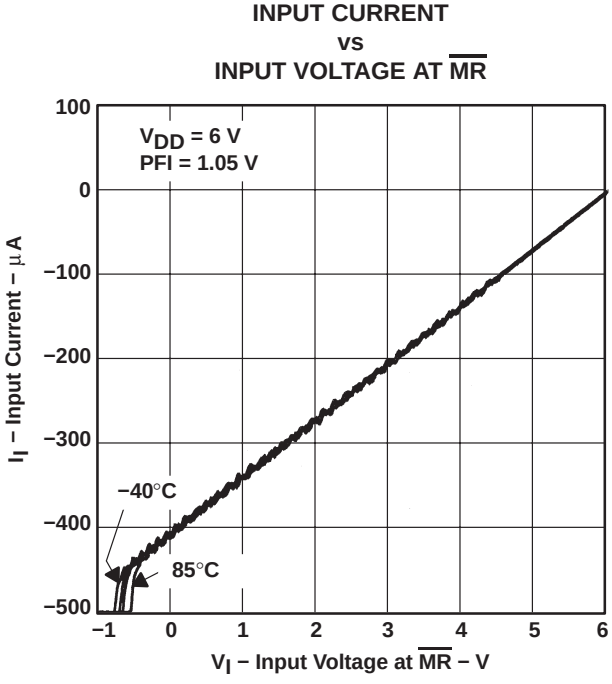


Figure 4

TYPICAL CHARACTERISTICS

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

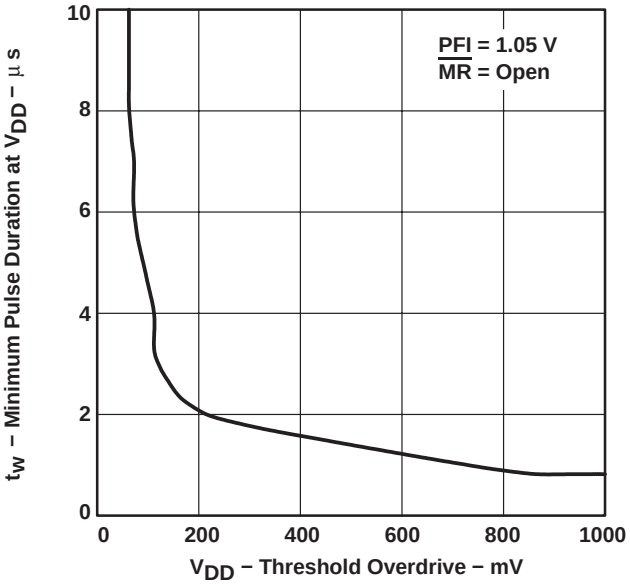


Figure 5

HIGH-LEVEL OUTPUT VOLTAGE vs HIGH-LEVEL OUTPUT CURRENT

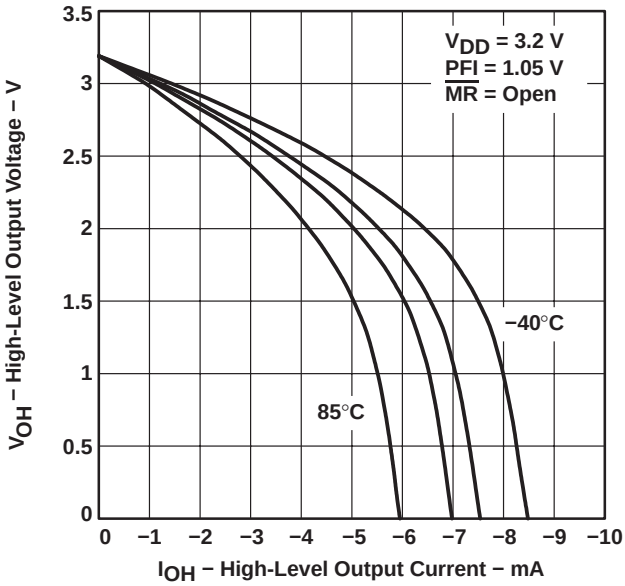


Figure 6

HIGH-LEVEL OUTPUT VOLTAGE vs HIGH-LEVEL OUTPUT CURRENT

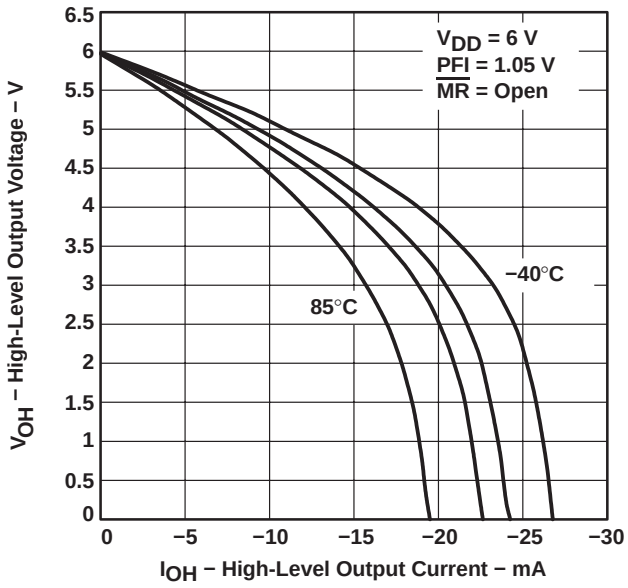


Figure 7

LOW-LEVEL OUTPUT VOLTAGE vs LOW-LEVEL OUTPUT CURRENT

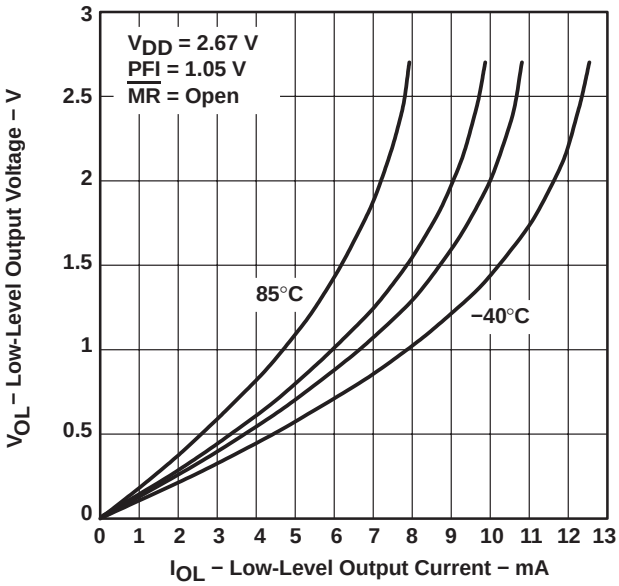


Figure 8

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
TPS3705-30D	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70530	Samples
TPS3705-30DG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70530	Samples
TPS3705-30DGN	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAT	Samples
TPS3705-30DGNG4	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAT	Samples
TPS3705-30DR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70530	Samples
TPS3705-30DRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70530	Samples
TPS3705-33D	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70533	Samples
TPS3705-33DG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70533	Samples
TPS3705-33DGN	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAU	Samples
TPS3705-33DGNG4	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAU	Samples
TPS3705-33DGNR	ACTIVE	MSOP-PowerPAD	DGN	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAU	Samples
TPS3705-33DGNRG4	ACTIVE	MSOP-PowerPAD	DGN	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAU	Samples
TPS3705-33DR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70533	Samples
TPS3705-33DRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70533	Samples
TPS3705-50D	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70550	Samples
TPS3705-50DG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70550	Samples
TPS3705-50DGN	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAV	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
TPS3705-50DGNG4	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAV	Samples
TPS3705-50DGNR	ACTIVE	MSOP-PowerPAD	DGN	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAV	Samples
TPS3705-50DGNRG4	ACTIVE	MSOP-PowerPAD	DGN	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAV	Samples
TPS3705-50DR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70550	Samples
TPS3705-50DRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70550	Samples
TPS3707-25D	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70725	Samples
TPS3707-25DG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70725	Samples
TPS3707-25DGN	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAW	Samples
TPS3707-25DGNG4	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAW	Samples
TPS3707-25DGNR	ACTIVE	MSOP-PowerPAD	DGN	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAW	Samples
TPS3707-25DGNRG4	ACTIVE	MSOP-PowerPAD	DGN	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAW	Samples
TPS3707-25DR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70725	Samples
TPS3707-25DRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70725	Samples
TPS3707-30D	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70730	Samples
TPS3707-30DG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70730	Samples
TPS3707-30DGN	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAX	Samples
TPS3707-30DGNG4	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAX	Samples
TPS3707-30DGNR	ACTIVE	MSOP-PowerPAD	DGN	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAX	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
TPS3707-30DGNRG4	ACTIVE	MSOP-PowerPAD	DGN	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAX	Samples
TPS3707-30DR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70730	Samples
TPS3707-30DRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70730	Samples
TPS3707-33D	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70733	Samples
TPS3707-33DG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70733	Samples
TPS3707-33DGN	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAY	Samples
TPS3707-33DGNG4	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAY	Samples
TPS3707-33DGNR	ACTIVE	MSOP-PowerPAD	DGN	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAY	Samples
TPS3707-33DGNRG4	ACTIVE	MSOP-PowerPAD	DGN	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAY	Samples
TPS3707-33DR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70733	Samples
TPS3707-33DRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70733	Samples
TPS3707-50D	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70750	Samples
TPS3707-50DG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70750	Samples
TPS3707-50DGN	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAZ	Samples
TPS3707-50DGNG4	ACTIVE	MSOP-PowerPAD	DGN	8	80	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAZ	Samples
TPS3707-50DGNR	ACTIVE	MSOP-PowerPAD	DGN	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAZ	Samples
TPS3707-50DGNRG4	ACTIVE	MSOP-PowerPAD	DGN	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	AAZ	Samples
TPS3707-50DR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70750	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
TPS3707-50DRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	70750	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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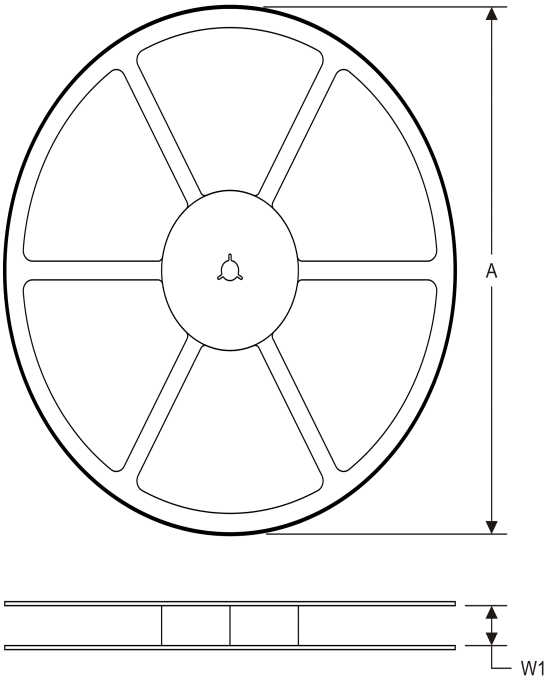
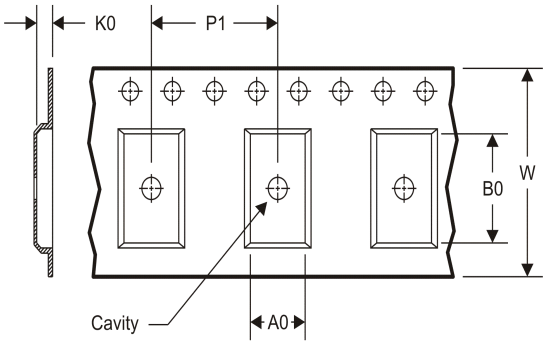
TAPE AND REEL INFORMATION

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

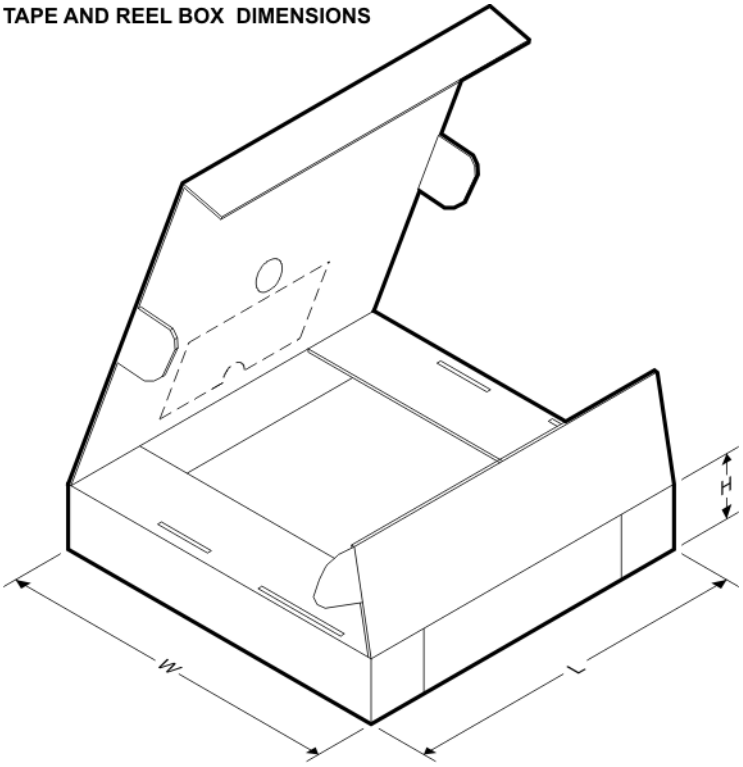
TAPE AND REEL INFORMATION

*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
TPS3705-30DR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TPS3705-33DGNR	MSOP-Power PAD	DGN	8	2500	330.0	12.4	5.3	3.4	1.4	8.0	12.0	Q1
TPS3705-33DR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TPS3705-50DGNR	MSOP-Power PAD	DGN	8	2500	330.0	12.4	5.3	3.4	1.4	8.0	12.0	Q1
TPS3705-50DR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TPS3707-25DGNR	MSOP-Power PAD	DGN	8	2500	330.0	12.4	5.3	3.4	1.4	8.0	12.0	Q1
TPS3707-25DR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TPS3707-30DGNR	MSOP-Power PAD	DGN	8	2500	330.0	12.4	5.3	3.4	1.4	8.0	12.0	Q1
TPS3707-30DR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TPS3707-30DR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TPS3707-33DGNR	MSOP-Power PAD	DGN	8	2500	330.0	12.4	5.3	3.4	1.4	8.0	12.0	Q1

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
TPS3707-33DR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TPS3707-50DGNR	MSOP-Power PAD	DGN	8	2500	330.0	12.4	5.3	3.4	1.4	8.0	12.0	Q1
TPS3707-50DR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1

TAPE AND REEL BOX DIMENSIONS

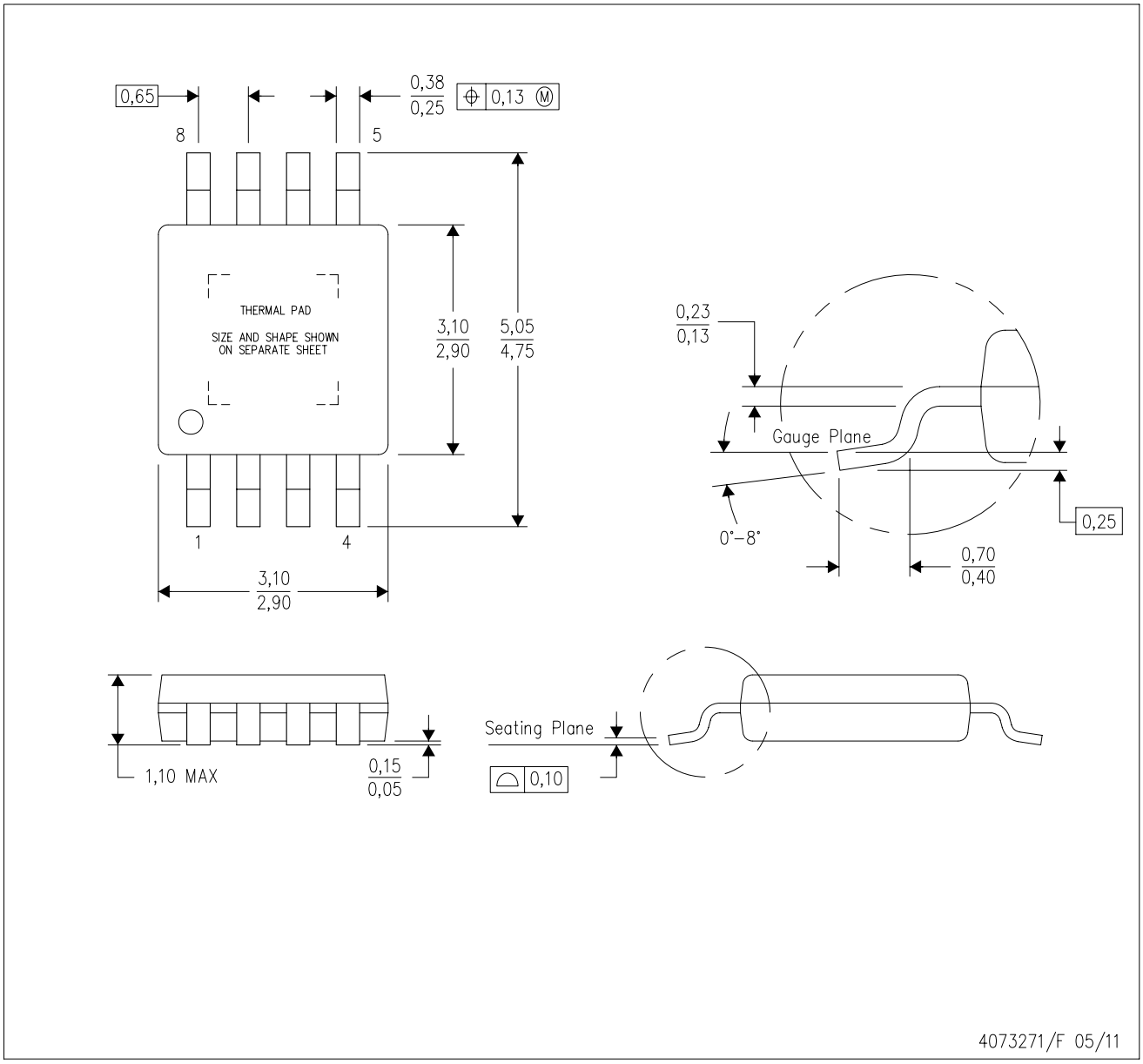


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TPS3705-30DR	SOIC	D	8	2500	367.0	367.0	35.0
TPS3705-33DGNR	MSOP-PowerPAD	DGN	8	2500	358.0	335.0	35.0
TPS3705-33DR	SOIC	D	8	2500	367.0	367.0	35.0
TPS3705-50DGNR	MSOP-PowerPAD	DGN	8	2500	358.0	335.0	35.0
TPS3705-50DR	SOIC	D	8	2500	367.0	367.0	35.0
TPS3707-25DGNR	MSOP-PowerPAD	DGN	8	2500	358.0	335.0	35.0
TPS3707-25DR	SOIC	D	8	2500	367.0	367.0	35.0
TPS3707-30DGNR	MSOP-PowerPAD	DGN	8	2500	358.0	335.0	35.0
TPS3707-30DR	SOIC	D	8	2500	367.0	367.0	35.0
TPS3707-30DR	SOIC	D	8	2500	367.0	367.0	35.0
TPS3707-33DGNR	MSOP-PowerPAD	DGN	8	2500	358.0	335.0	35.0
TPS3707-33DR	SOIC	D	8	2500	367.0	367.0	35.0

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TPS3707-50DGNR	MSOP-PowerPAD	DGN	8	2500	358.0	335.0	35.0
TPS3707-50DR	SOIC	D	8	2500	367.0	367.0	35.0

DGN (S–PDSO–G8) PowerPAD™ PLASTIC SMALL OUTLINE



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.
D. This package is designed to be soldered to a thermal pad on the board. Refer to Technical Brief, PowerPad Thermally Enhanced Package, Texas Instruments Literature No. SLMA002 for information regarding recommended board layout. This document is available at www.ti.com <http://www.ti.com>.
E. See the additional figure in the Product Data Sheet for details regarding the exposed thermal pad features and dimensions.
F. Falls within JEDEC MO–187 variation AA–T

PowerPAD is a trademark of Texas Instruments.

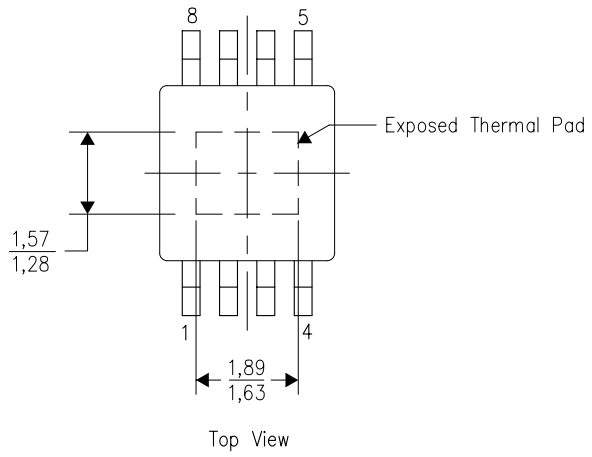
DGN (S–PDSO–G8) PowerPAD™ PLASTIC SMALL OUTLINE

THERMAL INFORMATION

This PowerPAD™ package incorporates an exposed thermal pad that is designed to be attached to a printed circuit board (PCB). The thermal pad must be soldered directly to the PCB. After soldering, the PCB can be used as a heatsink. In addition, through the use of thermal vias, the thermal pad can be attached directly to the appropriate copper plane shown in the electrical schematic for the device, or alternatively, can be attached to a special heatsink structure designed into the PCB. This design optimizes the heat transfer from the integrated circuit (IC).

For additional information on the PowerPAD package and how to take advantage of its heat dissipating abilities, refer to Technical Brief, PowerPAD Thermally Enhanced Package, Texas Instruments Literature No. SLMA002 and Application Brief, PowerPAD Made Easy, Texas Instruments Literature No. SLMA004. Both documents are available at www.ti.com.

The exposed thermal pad dimensions for this package are shown in the following illustration.



Top View

Exposed Thermal Pad Dimensions

4206323–2/I 12/11

NOTE: All linear dimensions are in millimeters

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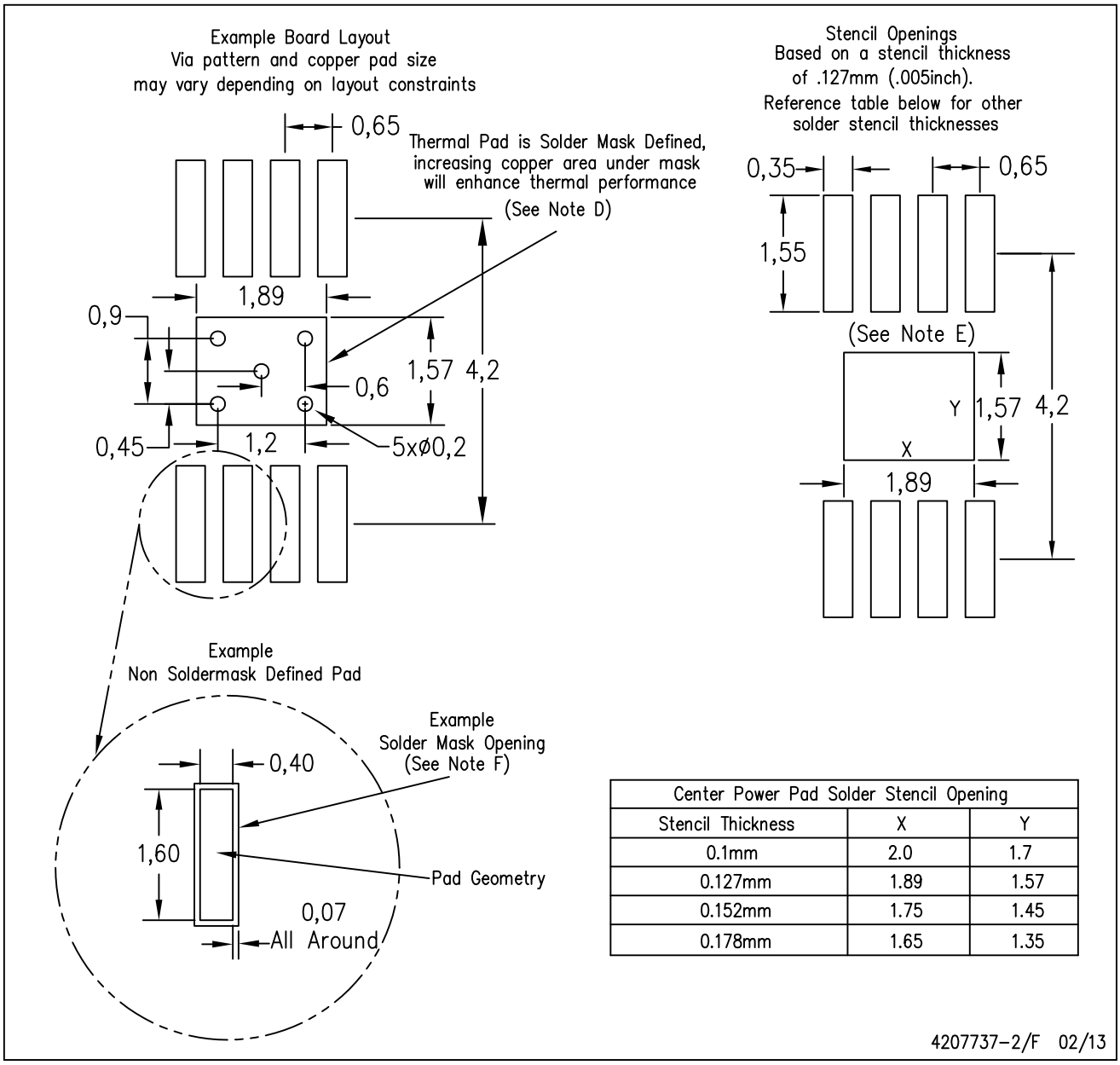
DGN (R–PDSO–G8) PowerPAD™ PLASTIC SMALL OUTLINE



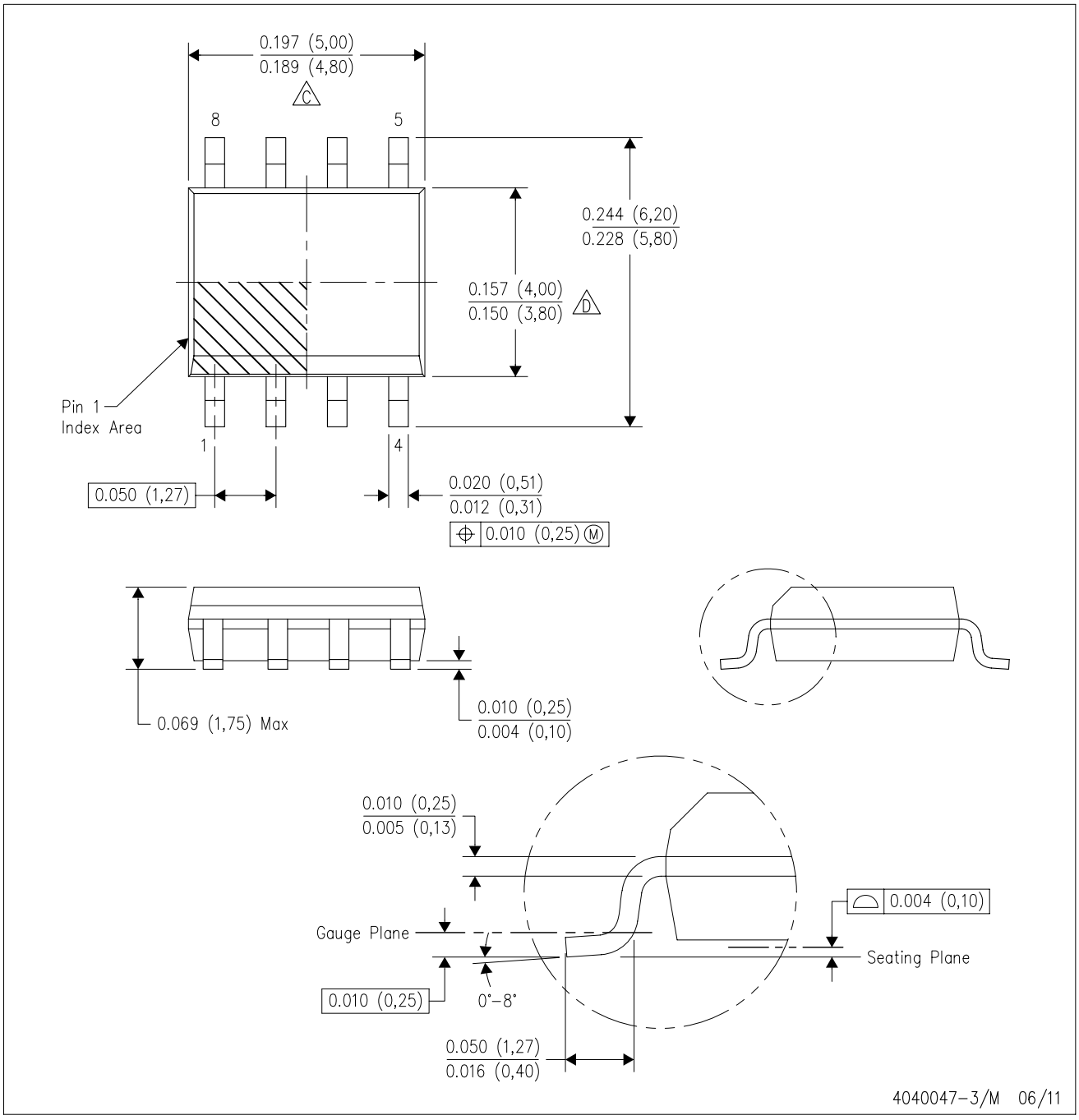
Center Power Pad Solder Stencil Opening		
Stencil Thickness	X	Y
0.1mm	2.0	1.7
0.127mm	1.89	1.57
0.152mm	1.75	1.45
0.178mm	1.65	1.35

4207737–2/F 02/13

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. This package is designed to be soldered to a thermal pad on the board. Refer to Technical Brief, PowerPad Thermally Enhanced Package, Texas Instruments Literature No. SLMA002, SLMA004, and also the Product Data Sheets for specific thermal information, via requirements, and recommended board layout. These documents are available at www.ti.com <http://www.ti.com>.
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.
F. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

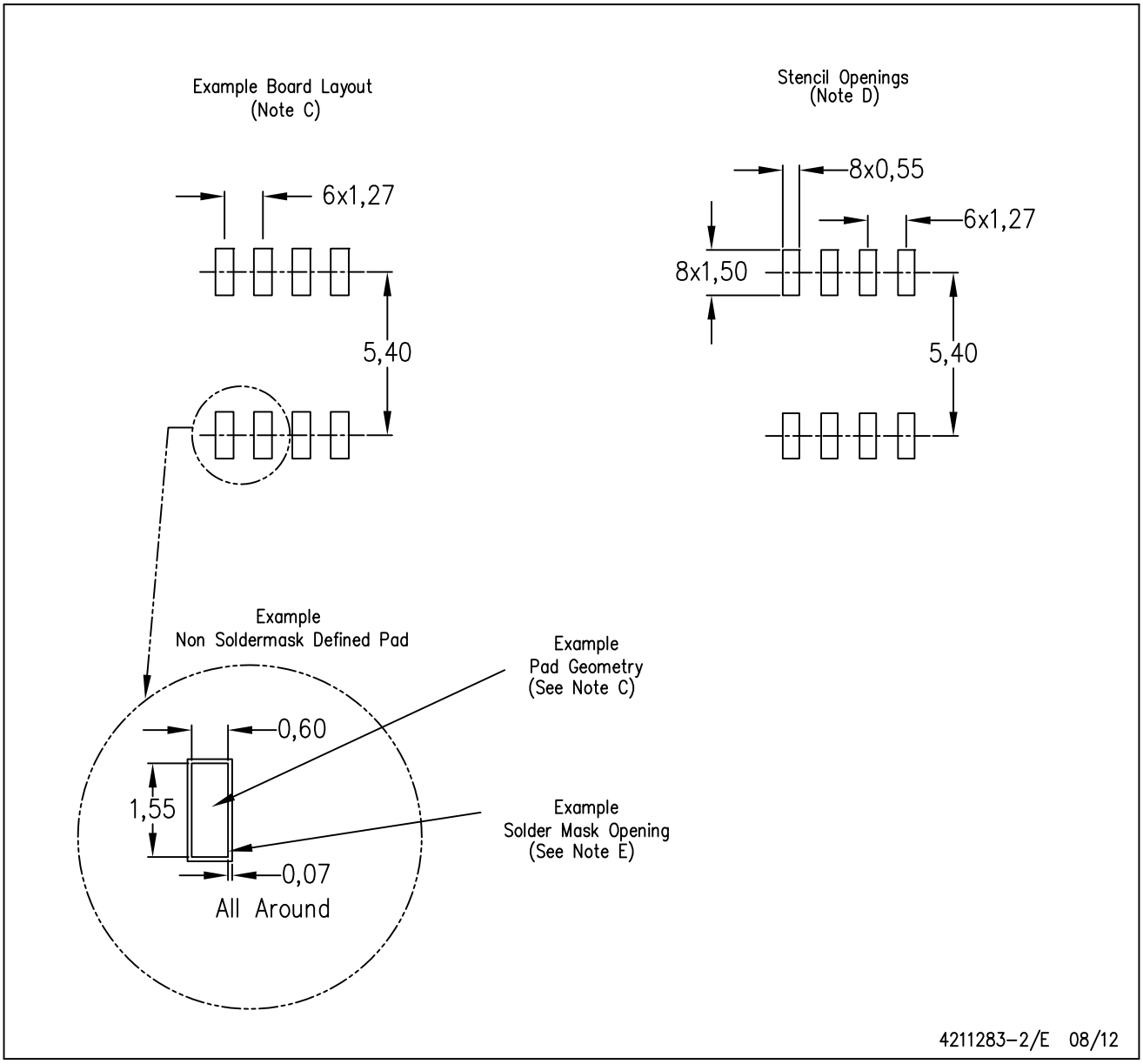
PowerPAD is a trademark of Texas Instruments

D (R–PDSO–G8) PLASTIC SMALL OUTLINE



NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
D. Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
E. Reference JEDEC MS–012 variation AA.

D (R–PDSO–G8) PLASTIC SMALL OUTLINE



NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Publication IPC–7351 is recommended for alternate designs.
D. 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. Refer to IPC–7525 for other stencil recommendations.
E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

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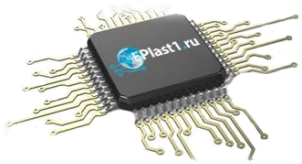
Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.