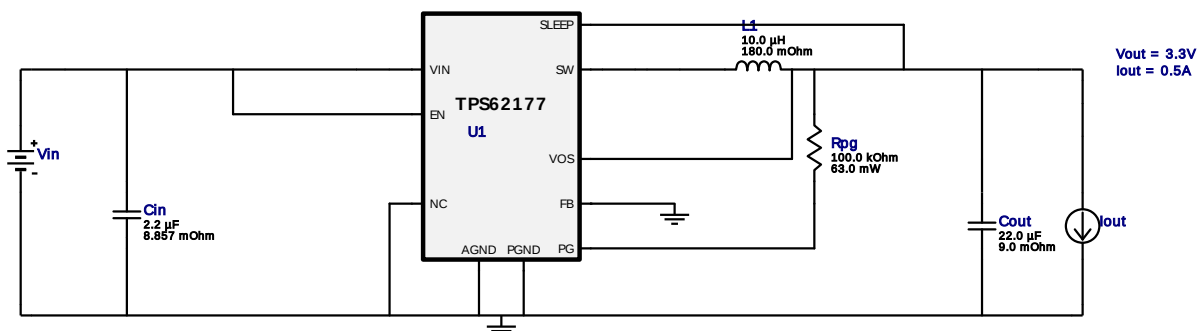


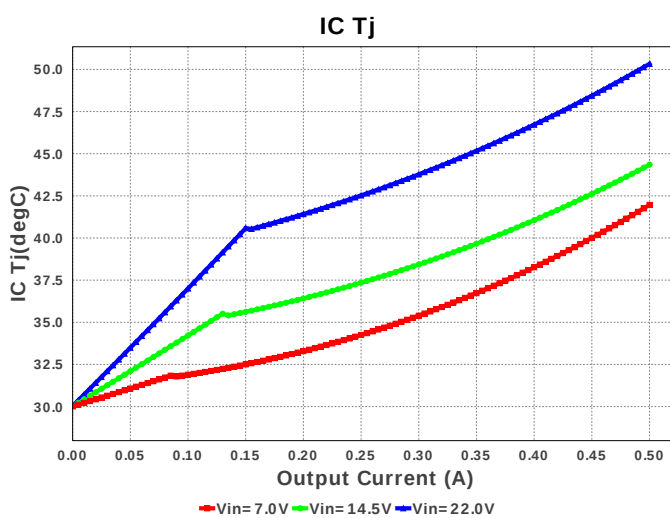
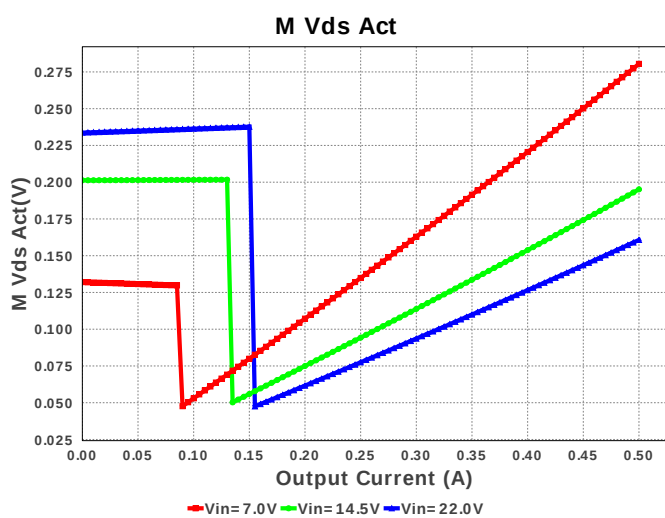
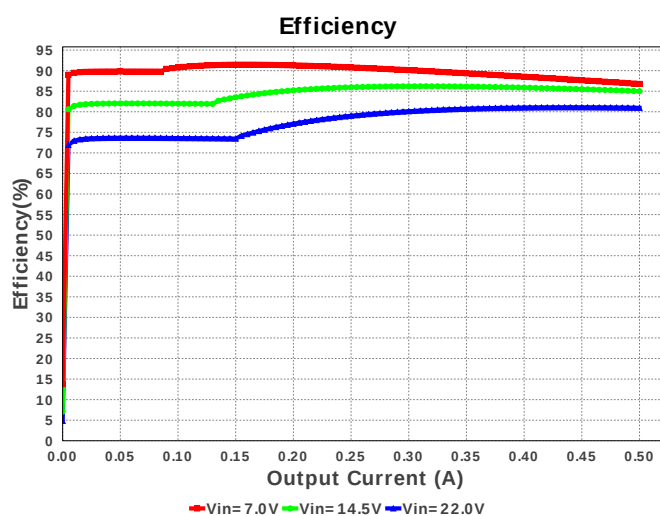
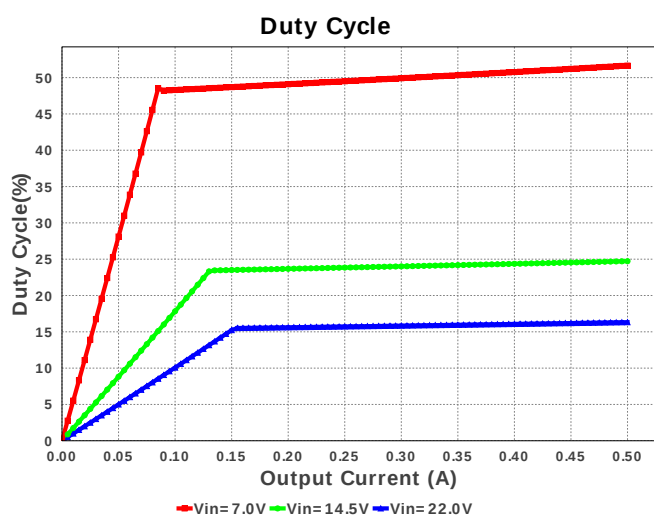
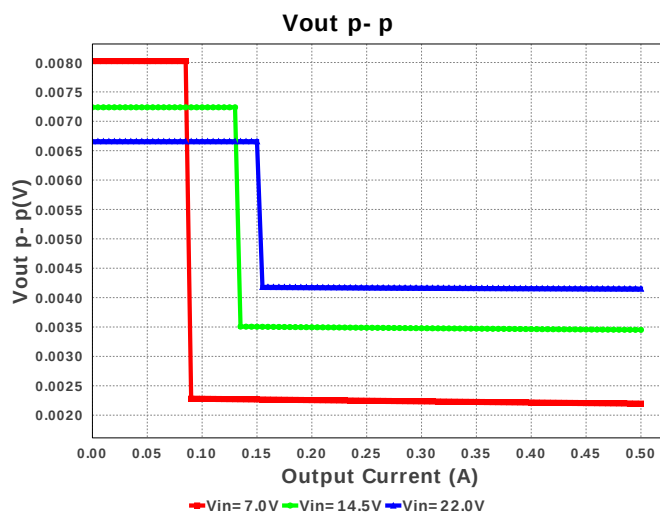
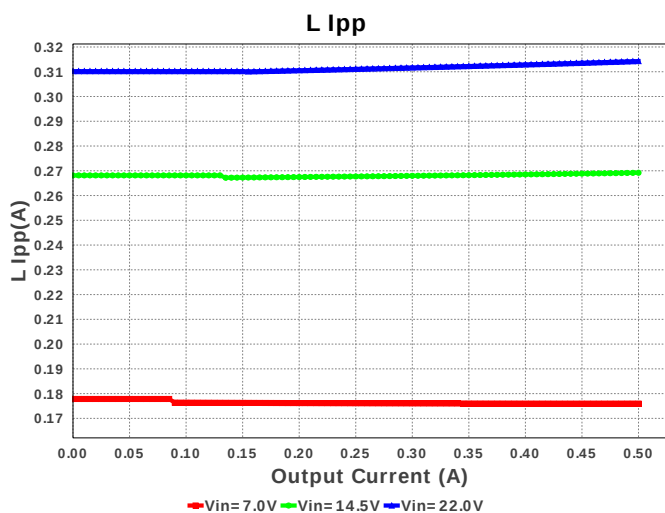
WEBENCH® Design Report

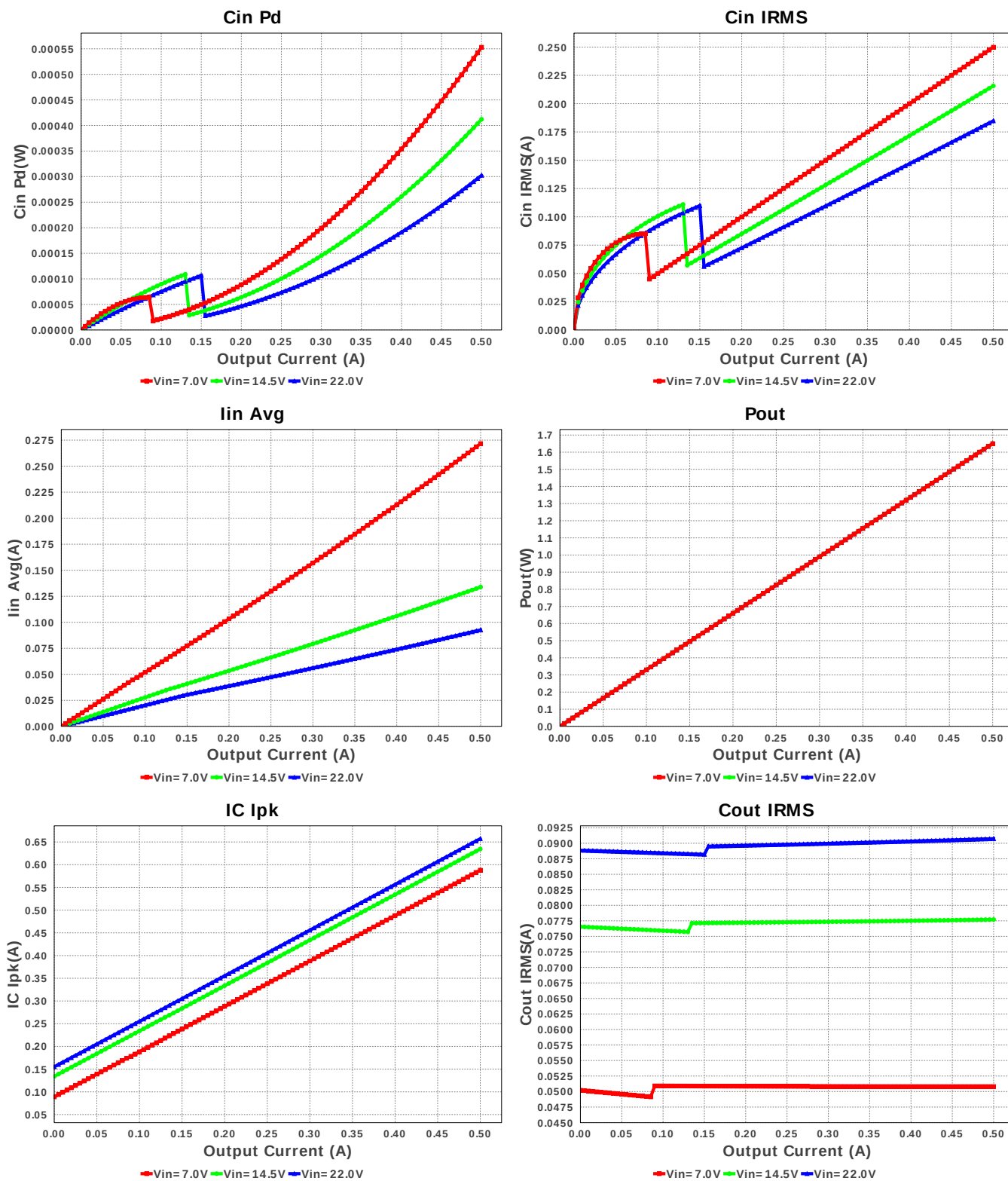
Design : 4744944/1 TPS62177DQCR
TPS62177DQCR 7.0V-22.0V to 3.30V @ 0.5A

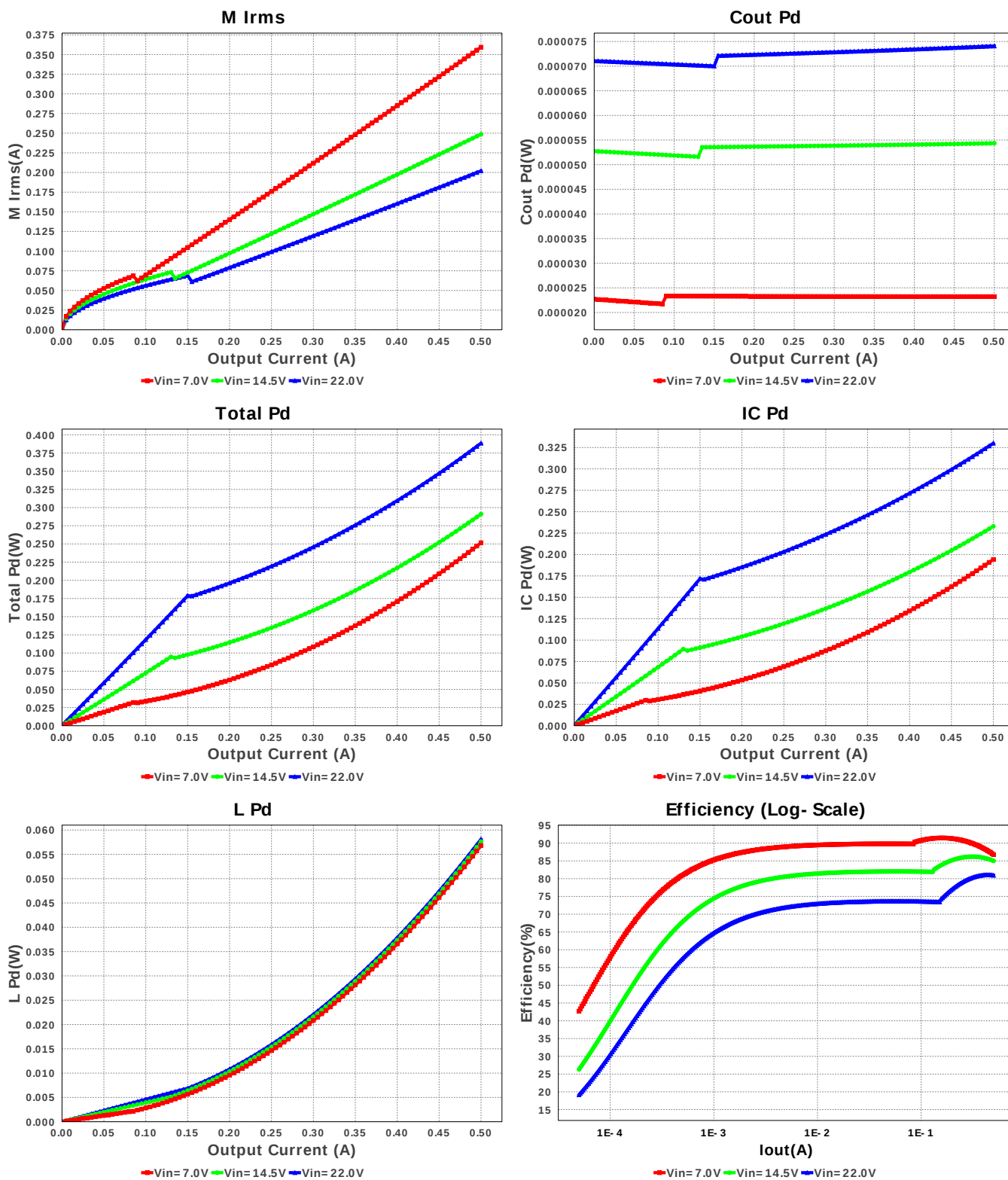


Electrical BOM

#	Name	Manufacturer	Part Number	Properties	Qty	Price	Footprint
1.	Cin	MuRata	GRM21BR61E225KA12L Series= X5R	Cap= 2.2 uF ESR= 8.857 mOhm VDC= 25.0 V IRMS= 1.3111 A	1	\$0.04	0805 7 mm ²
2.	Cout	MuRata	GRM21BR60J226ME39L Series= X5R	Cap= 22.0 uF ESR= 9.0 mOhm VDC= 6.3 V IRMS= 3.5 A	1	\$0.04	0805 7 mm ²
3.	L1	Coilcraft	LPS4018-103MRB	L= 10.0 uH DCR= 180.0 mOhm	1	\$0.35	LPS4018 24 mm ²
4.	Rpg	Vishay-Dale	CRCW0402100KFKED Series= CRCW..e3	Res= 100.0 kOhm Power= 63.0 mW Tolerance= 1.0%	1	\$0.01	0402 3 mm ²
5.	U1	Texas Instruments	TPS62177DQCR	Switcher	1	\$0.58	R-PWSON-N10 12 mm ²







Operating Values

#	Name	Value	Category	Description
1.	Cin IRMS	184.791 mA	Current	Input capacitor RMS ripple current
2.	Cout IRMS	90.73 mA	Current	Output capacitor RMS ripple current
3.	IC IpK	657.149 mA	Current	Peak switch current in IC
4.	Iin Avg	92.658 mA	Current	Average input current
5.	L Ipp	314.3 mA	Current	Peak-to-peak inductor ripple current
6.	M1 Irms	202.013 mA	Current	Q lavg
7.	BOM Count	5	General	Total Design BOM count
8.	FootPrint	53.0 mm ²	General	Total Foot Print Area of BOM components
9.	Frequency	971.224 kHz	General	Switching frequency
10.	IC Tolerance	24.0 mV	General	IC Feedback Tolerance
11.	M Vds Act	160.714 mV	General	Voltage drop across the MosFET

#	Name	Value	Category	Description
12.	Pout	1.65 W	General	Total output power
13.	Total BOM	\$1.02	General	Total BOM Cost
14.	Vout OP	3.3 V	Op_Point	Operational Output Voltage
15.	Duty Cycle	16.324 %	Op_point	Duty cycle
16.	Efficiency	80.943 %	Op_point	Steady state efficiency
17.	IC Tj	50.328 degC	Op_point	IC junction temperature
18.	ICThetaJA	61.6 degC/W	Op_point	IC junction-to-ambient thermal resistance
19.	IOUT_OP	500.0 mA	Op_point	Iout operating point
20.	VIN_OP	22.0 V	Op_point	Vin operating point
21.	Vout p-p	4.152 mV	Op_point	Peak-to-peak output ripple voltage
22.	Cin Pd	302.446 μ W	Power	Input capacitor power dissipation
23.	Cout Pd	74.087 μ W	Power	Output capacitor power dissipation
24.	IC Pd	330.004 mW	Power	IC power dissipation
25.	L Pd	58.102 mW	Power	Inductor power dissipation
26.	Total Pd	388.472 mW	Power	Total Power Dissipation
27.	Vout Tolerance	727.27 m%		Vout Tolerance based on IC Tolerance (no load) and voltage divider resistors if applicable

Design Inputs

#	Name	Value	Description
1.	Iout	500.0 m	Maximum Output Current
2.	VinMax	22.0	Maximum input voltage
3.	VinMin	7.0	Minimum input voltage
4.	Vout	3.3	Output Voltage
5.	base_pn	TPS62177	Base Product Number
6.	source	DC	Input Source Type
7.	Ta	30.0	Ambient temperature

Design Assistance

1. [TPS62177 Product Folder](http://www.ti.com/product/TPS62177) : <http://www.ti.com/product/TPS62177> : contains the data sheet and other resources.

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