

PKM 4202NG series
Intermediate Bus Converters, Input 36-55 V, Output 27 A

EN/LZT 146 341 R1A February 2006

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Key Features

- Industry standard Quarter-brick
57.9 x 36.8 x 10.9mm (2.28 x 1.45 x 0.43in.)
- Single side design for low cost
- High efficiency, typ. 96 % at 12 Vout, 50% load & 48Vin
- 1500 Vdc input to output isolation
- Meets safety requirements according to IEC/EN/UL 60950
- More than 2.2 million hours MTBF



General Characteristics

- Input under voltage protection
- Input over voltage shutdown (OVP)
- Over temperature protection
- Output short-circuit protection
- Remote control
- Highly automated manufacturing ensures quality
- ISO 9001/14001 certified supplier

Safety Approvals



Design for Environment



Meets requirements in high-temperature lead-free soldering processes.

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Product Program	Ordering No.	
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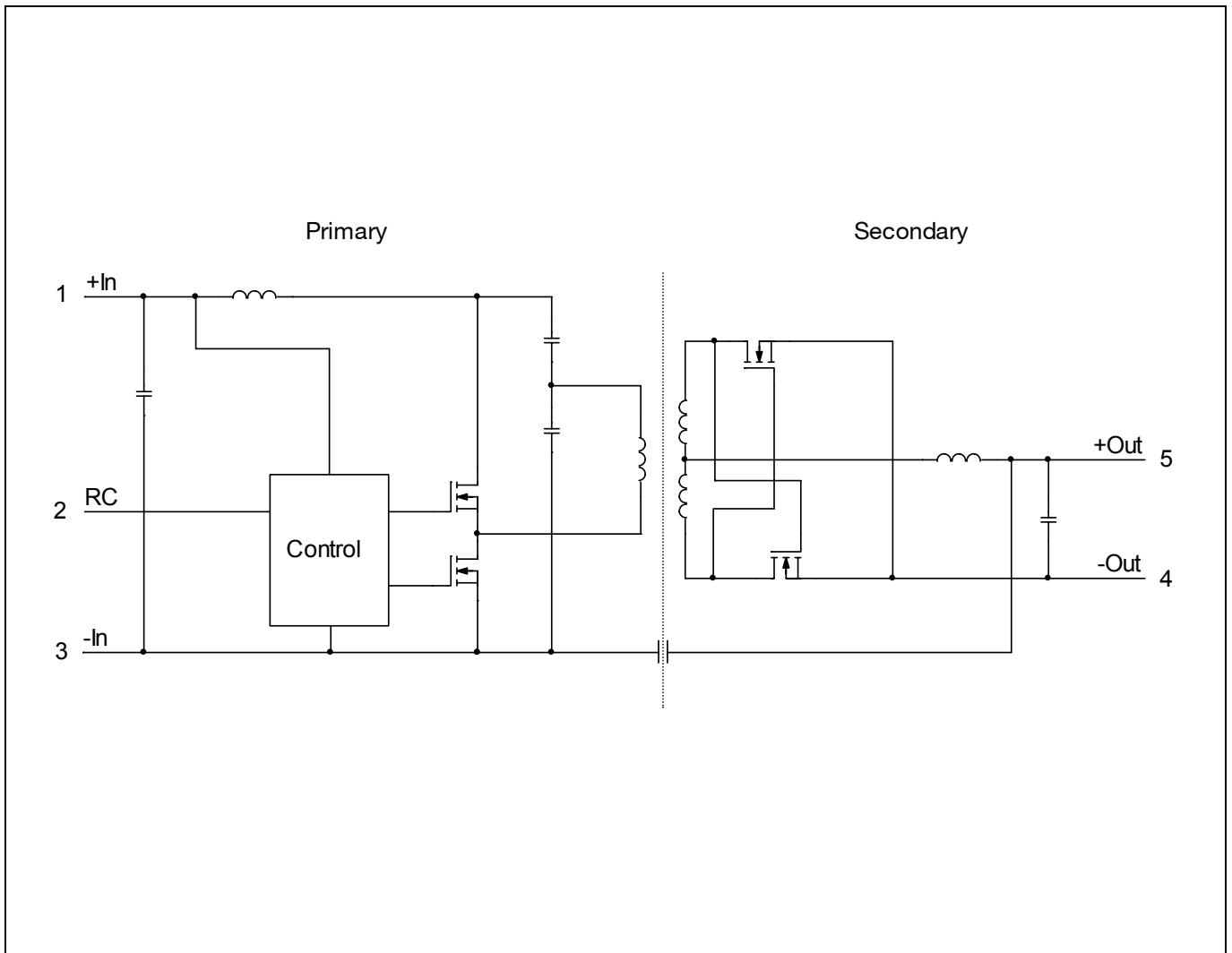
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Absolute Maximum Ratings

Characteristics		min	typ	max	Unit
T_{ref}	Operating Temperature (see Thermal Consideration section)	-40		+110	°C
T_s	Storage temperature	-55		+125	°C
V_I	Input voltage	-0.3		+60	V
V_{iso}	Isolation voltage (input to output test voltage)			1500	Vdc
V_{tr}	Input voltage transient (t_p 100 ms)			60	V
V_{RC}	Remote Control pin voltage (see Operating Information section)	Positive logic option		11	V
		Negative logic option	-0.5	18	V

Stress in excess of Absolute Maximum Ratings may cause permanent damage. Absolute Maximum Ratings, sometimes referred to as no destruction limits, are normally tested with one parameter at a time exceeding the limits of Output data or Electrical Characteristics. If exposed to stress above these limits, function and performance may degrade in an unspecified manner.

Fundamental Circuit Diagram



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9.6 V/27 A Electrical Specification
PKM 4202NG
 $T_{ref} = -40$ to $+90^{\circ}\text{C}$, $V_I = 36$ to 55 V, unless otherwise specified under Conditions.

 Typical values given at: $T_{ref} = +25^{\circ}\text{C}$, $V_I = 48$ V, max I_O , unless otherwise specified under Conditions.

Characteristics		Conditions	min	typ	max	Unit
V_I	Input voltage range		36		55	V
V_{loff}	Turn-off input voltage	Decreasing input voltage	31	32.5	34.5	V
V_{lon}	Turn-on input voltage	Increasing input voltage	32.5	34	35.5	V
C_I	Internal input capacitance			6.7		μF
P_O	Output power	$V_I = 36$ V	0		179	W
		$V_I = 48$ V	0		244	
		$V_I = 55$ V	0		282	
η	Efficiency	50 % of max I_O , $V_I = 48$ V		96.0		%
		max I_O , $V_I = 48$ V		95.0		
P_d	Power Dissipation	max I_O		13	16	W
P_{li}	Input idling power	$I_O = 0$ A, $V_I = 48$ V		3.5		W
P_{RC}	Input standby power	$V_I = 48$ V (turned off with RC)		0.2		W
f_s	Switching frequency	0-100 % of max I_O	150	170	188	kHz

V_{Oi}	Output voltage initial setting and accuracy	$T_{ref} = +25^{\circ}\text{C}$, $V_I = 48$ V, $I_O = 0$ A	9.5	9.6	9.7	V
V_O	Output voltage tolerance band	0-100 % of max I_O	6.4		11.2	V
	Idling voltage	$I_O = 0$ A	6.8		11.2	V
	Line regulation	See Note 1	$(V_{Imax} - V_{Imin})/4$			V
	Load regulation	$V_I = 48$ V, 0-100 % of max I_O	0.40	0.55	0.70	V
V_{tr}	Load transient voltage deviation	$V_I = 48$ V, Load step 25-75-25 % of max I_O , $di/dt = 1$ A/ μs		± 750		mV
t_{tr}	Load transient recovery time			25		μs
t_r	Ramp-up time (from 10-90 % of V_{Oi})	0-100 % of max I_O	0.5	4	5	ms
t_s	Start-up time (from V_I connection to 90 % of V_{Oi})		1.5	5	6	ms
t_f	V_I shut-down fall time (from V_I off to 10 % of V_O)	max I_O		0.1		ms
t_{RC}	RC start-up time	max I_O		5.5		ms
	RC shut-down fall time (from RC off to 10 % of V_O)	max I_O		0.1		ms
I_O	Output current		0		27	A
I_{lim}	Current limit threshold	$T_{ref} < \text{max } T_{ref}$	29	32	36	A
I_{sc}	Short circuit current	See Note 2				
V_{Oac}	Output ripple & noise	See ripple & noise section, max I_O		90	-	mVp-p
OVP	Over voltage protection	See Note 3			12	V

 Note 1: $V_O = V/5$ -load regulation. Example: at $V_I = 48$ V and max I_O , $V_O = 48/5 - 0.55 = 9.05$ V.

Note 2: See Operating Information section.

 Note 3: See Operating Information section. The internal OVP circuit detects the input voltage and is activated at an input voltage between 55.5 to 60 V and typically at 58 V. The OVP limits the output voltage to max 12 V, this will occur at $V_I = 60$ V and $I_O = 0$ A, given by the formula: $V_O = V/5$ -load regulation = $60/5 - 0 = 12$ V.

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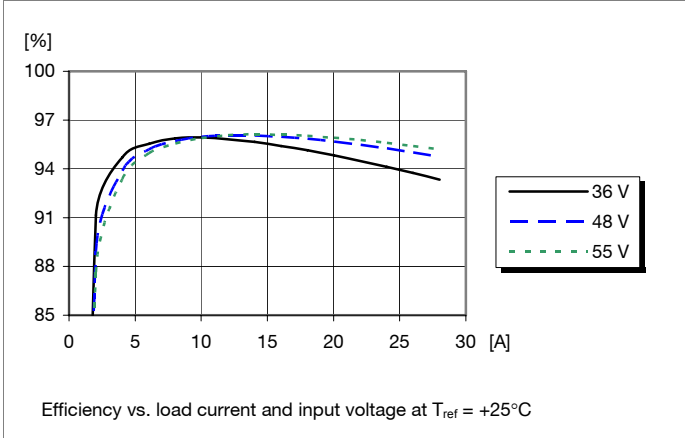
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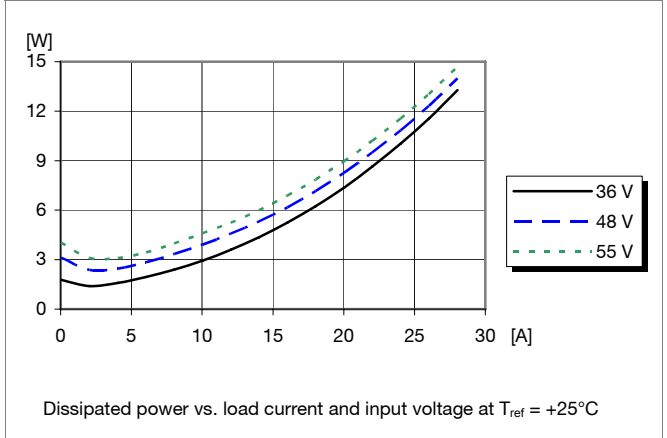
9.6 V/27 A Typical Characteristics

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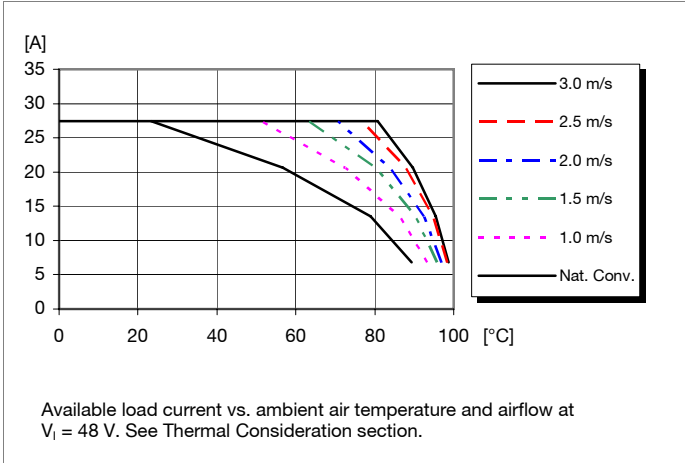
Efficiency



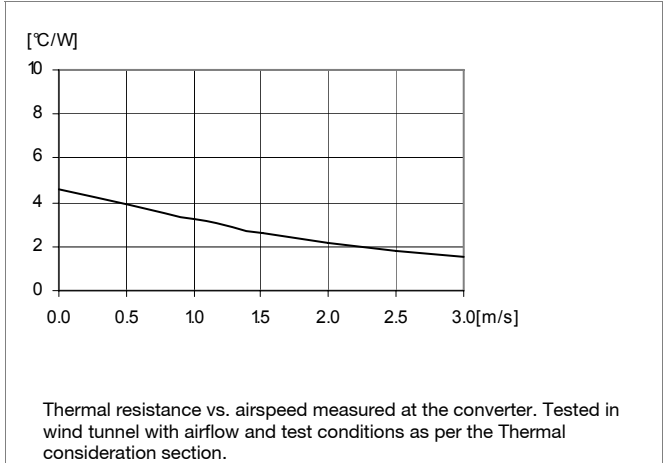
Power Dissipation



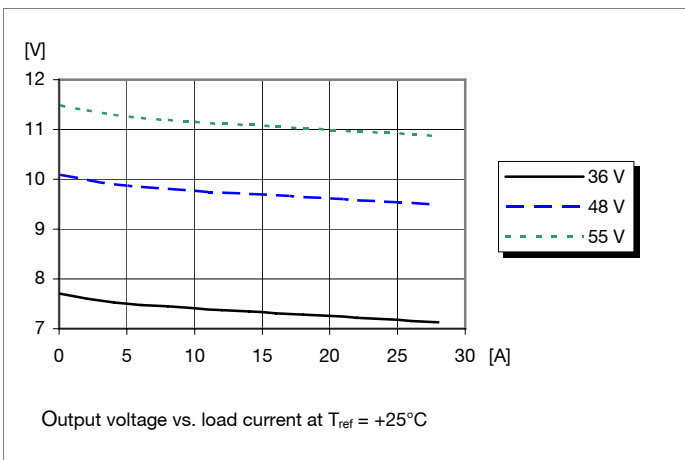
Output Current Derating



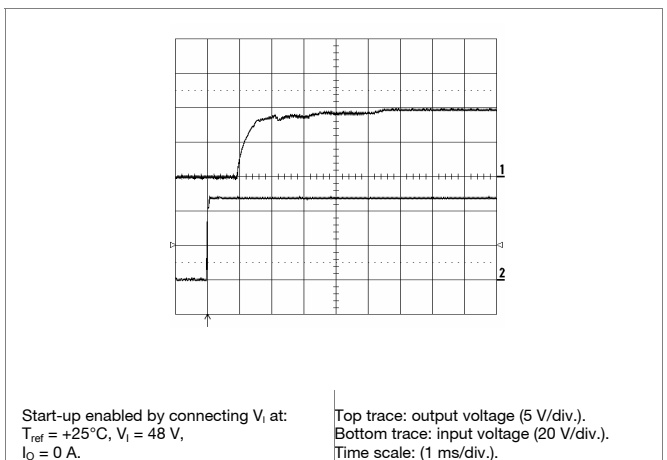
Thermal Resistance



Output Characteristics



Start-up at no load



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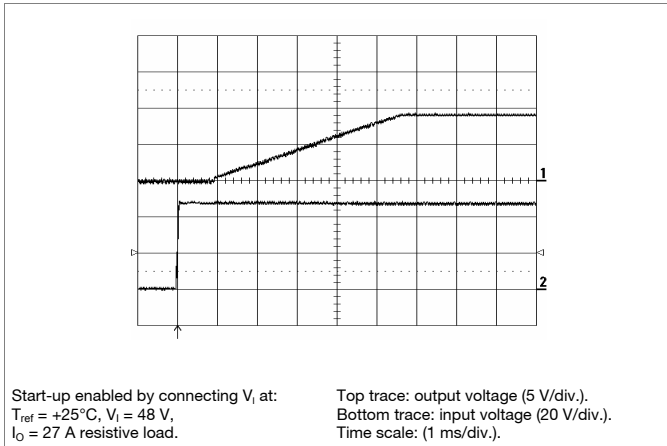
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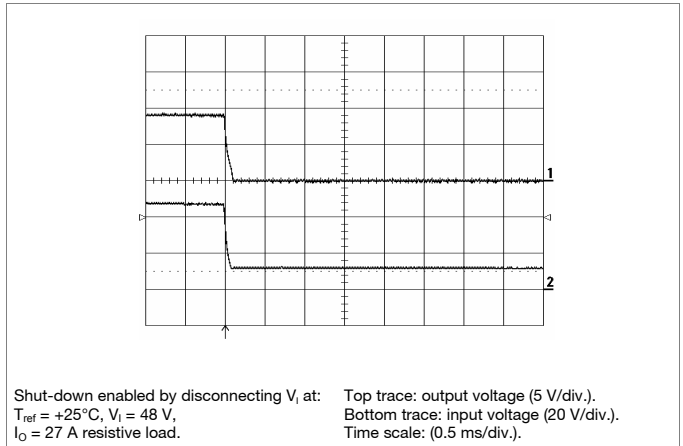
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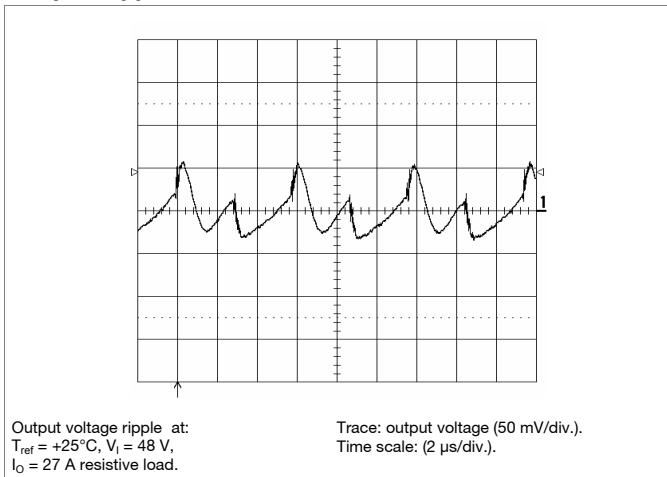
Start-up



Shut-down



Output Ripple & Noise



Output Load Transient Response

