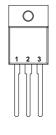


 $\begin{array}{l} \text{Pin 1} - \text{V}_{\text{IN}} \\ \text{Pin 2} - \text{V}_{\text{OUT}} \\ \text{Case} - \text{Ground} \end{array}$ 







V Package – TO–218

# POSITIVE VOLTAGE REGULATORS

**5 AMP** 

### **FEATURES**

- 0.01%/V LINE REGULATION
- 0.5% LOAD REGULATION
- 1% OUTPUT TOLERANCE (-A VERSIONS)
- AVAILABLE IN 5V, 12V AND 15V OPTIONS
- COMPLETE SERIES OF PROTECTIONS:
  - CURRENT LIMITING
  - THERMAL SHUTDOWN
  - SOA CONTROL

Order Information										
Part	Part K-Pack V-Pack Temp.									
Number	(TO–3)									
IP1R18Axx–zz ✔ -55 to +150°C										
IP1R18xx–zz	IP1R18xx−zz 🖌 "									
IP3R18Azz–xx ✔ ✔ 0 to +125°C										
IP3R18zz-xx	<b>v</b>	~	"							
Note:										
xx = Voltage Co (05, 12, 15		zz = Package Code (K, V)								
eg. IP1R18AK–05 IP3R18V–12										

### **ABSOLUTE MAXIMUM RATINGS** (T<sub>case</sub> = 25°C unless otherwise stated)

VI	DC Input Voltage	35V
PD	Power Dissipation	Internally limited
TJ	Operating Junction Temperature Range	See Table Above
T <sub>STG</sub>	Storage Temperature Range	–65°C to +150°C
TL	Lead Temperature (Soldering, 10 sec)	300°C



#### **ELECTRICAL CHARACTERISTICS** (T<sub>J</sub> = 25°C unless otherwise stated)

			IP1R18A–05 IP3R18A–05			IF IF					
Parameter Test Conditions <sup>2</sup>		ons <sup>2</sup>	Min.	Тур.	Max.	Min.	Тур.	Max.	Units		
				4.95	5	5.05	4.85		5.15	V	
V		$I_0 = 5mA$ to 5/	4								
Vo	Output Voltage	$P_{OUT} \le 50W$	$V_{IN} = 8V$ to 20V	4.85		5.15	4.75		5.25	V	
		T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>								
$\Delta V_{O}$	Line Degulation	V <sub>IN</sub> = 7.5V to 3	35V		3	15		6	30		
$\frac{\sigma}{\Delta V_{I}}$	Line Regulation	l <sub>O</sub> = 5mA <sup>3</sup>	T <sub>J</sub> = Over Temp. Range <sup>1</sup>		6	30		12	60	mV	
$\Delta V_{O}$	Lood Doculation	$I_0 = 5mA$ to 5/	ά 3		5 25			10	50		
$\overline{\Delta I_O}$	Load Regulation		T <sub>J</sub> = Over Temp. Range <sup>1</sup>		10	50		20	100	mV	
Ι <sub>Q</sub>	Quiescent Current	I <sub>O</sub> = 5mA	T <sub>J</sub> = Over Temp. Range <sup>1</sup>			7			7	mA	
		I <sub>O</sub> = 5mA to 5/	Α		10				10		
	Quiescent Current	T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>	10				10			
$\Delta I_Q$	Change	I <sub>O</sub> = 5mA	V <sub>IN</sub> = 7.5V to 35V		3				0	- mA	
		T <sub>J</sub> = Over Temp. Range <sup>1</sup>				3			3		
V	Dropout Voltage	I <sub>O</sub> = 5A	$\Delta V_{OUT} = 100 \text{mV}$		0.5	3		2.5	3	V	
VD		T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>		2.5	3					
	D:   D : /:	I <sub>O</sub> = 1A	f = 120Hz	60	80		60	80		dB	
	Ripple Rejection	T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>	60							
	Thermal Regulation	t <sub>p</sub> = 20ms	ΔP = 50W		0.002	0.01		0.002	0.02	%/W	
I <sub>PEAK</sub>	Peak Output Current	V <sub>IN</sub> = 10V	T <sub>J</sub> = Over Temp. Range <sup>1</sup>		8	12		8	12	Α	
		V <sub>IN</sub> = 10V		7 2				7			
I <sub>SC</sub>	Short Circuit Current	V <sub>IN</sub> = 35V					2		A		
e <sub>n</sub>	Output Noise Voltage	f = 10Hz to 100kHz			40			40		μV	
	Thermal Resistance	K Package			1.0	1.5		1.0	1.5	·~^^/	
$R_{\theta JC}$	Junction to Case	V Package			1.0	1.5		1.0	1.5	°C/W	

Notes

1) Applies over full temperature range:-

 $T_{J} = -55 \text{ to } +150^{\circ}\text{C} \text{ for IP1R18A} - 05 / \text{IP1R18} - 05$ 

 $T_J = 0$  to +125°C for IP3R18A-05 / IP3R18-05

All other specifications apply at  $T_{\rm J}$  = 25°C unless otherwise stated.

2) Test conditions unless otherwise stated:-

 $V_{IN} = 10V$ ,  $I_{OUT} = 2.5A$ .

Although Power Dissipation is internally limited, these specifications apply for Power Dissipation up to 50W.

3) Load and Line regulation are electrically independent and are measured using pulse techniques at low duty cycle in order to maintain constant junction temperature. To determine the effects on the output voltage due to device heating, refer to thermal regulation specification.



### **ELECTRICAL CHARACTERISTICS** ( $T_J = 25^{\circ}C$ unless otherwise stated)

					1R18A- 3R18A-		IP IP				
Parameter		Test Conditions <sup>2</sup>		Min.	Тур.	Max.	Min.	Тур.	Max.	Units	
				11.88	12	12.12	11.64	12	12.36	V	
V		I <sub>O</sub> = 5mA to 5/	4								
Vo	Output Voltage	P <sub>OUT</sub> ≤ 50W	$V_{IN} = 15V$ to 27V	11.64		12.36	11.40		12.60	V	
		T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>								
$\Delta V_{O}$	Liss Develotion	V <sub>IN</sub> = 14.5V to	35V		5	30		10	60		
$\overline{\Delta V_I}$	Line Regulation	I <sub>O</sub> = 5mA <sup>3</sup>	$T_J = Over Temp. Range ^1$		10	60		20	120	mV	
$\Delta V_{O}$	Lood Doculation	I <sub>O</sub> = 5mA to 5/	<b>Δ</b> 3	10 60		60		20	120		
$\overline{\Delta I_O}$	Load Regulation		T <sub>J</sub> = Over Temp. Range <sup>1</sup>		20	120		40	240	mV	
l <sub>Q</sub>	Quiescent Current	I <sub>O</sub> = 5mA	T <sub>J</sub> = Over Temp. Range <sup>1</sup>			7			7	mA	
		I <sub>O</sub> = 5mA to 5A							10		
	Quiescent Current	T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>	10				10			
∆l <sub>Q</sub>	Change	I <sub>O</sub> = 5mA	V <sub>IN</sub> = 14.5V to 35V			0			2	mA	
		T <sub>J</sub> = Over Temp. Range <sup>1</sup>				3		3			
V	Dropout Voltage	I <sub>O</sub> = 5A	$\Delta V_{OUT} = 250 mV$		0.5	0		2.5	3	V	
VD		T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>		2.5	3					
		I <sub>O</sub> = 1A	f = 120Hz	F 0	70		50	70			
	Ripple Rejection	T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>	52 72			52	72		dB	
	Thermal Regulation	t <sub>p</sub> = 20ms	$\Delta P = 50W$		0.002	0.01		0.002	0.02	%/W	
I <sub>PEAK</sub>	Peak Output Current	V <sub>IN</sub> = 17V	T <sub>J</sub> = Over Temp. Range <sup>1</sup>		8	12		8	12	А	
-	Short Circuit Current	V <sub>IN</sub> = 17V		4				4			
I <sub>SC</sub>		V <sub>IN</sub> = 35V			2			2		A	
e <sub>n</sub>	Output Noise Voltage				75			75		μV	
Р	Thermal Resistance	K Package			1.0	1.5		1.0	1.5	0000	
$R_{ extsf{ heta}JC}$	Junction to Case	V Package			1.0	1.5		1.0	1.5	°C/W	

Notes

1) Applies over full temperature range:-

 $T_{J} = -55$  to +150°C for IP1R18A-12 / IP1R18-12

 $T_J = 0$  to +125°C for IP3R18A–12 / IP3R18–12

All other specifications apply at  $T_J = 25^{\circ}C$  unless otherwise stated.

2) Test conditions unless otherwise stated:-

 $V_{IN} = 17V$ ,  $I_{OUT} = 2.5A$ .

Although Power Dissipation is internally limited, these specifications apply for Power Dissipation up to 50W.

3) Load and Line regulation are electrically independent and are measured using pulse techniques at low duty cycle in order to maintain constant junction temperature. To determine the effects on the output voltage due to device heating, refer to thermal regulation specification.



### **ELECTRICAL CHARACTERISTICS** ( $T_J = 25^{\circ}C$ unless otherwise stated)

		IP1R18A–15 IP3R18A–15			IP IP						
Parameter		Test Conditions <sup>2</sup>		Min.	Тур.	Max.	Min.	Тур.	Max.	Units	
				14.85	15	15.15	14.55	15	15.45	V	
V	Output Voltage	$I_0 = 5mA$ to 5A									
Vo		$P_{OUT} \le 50W$	$V_{IN} = 18V$ to $30V$	14.55		15.45	14.25		15.75	V	
		T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>								
$\Delta V_{O}$	Line Regulation	V <sub>IN</sub> = 17.5V to	35V		8	40		16	80	m\/	
$\overline{\Delta V_{I}}$	Line Regulation	I <sub>O</sub> = 5mA <sup>3</sup>	T <sub>J</sub> = Over Temp. Range <sup>1</sup>		16	80		32	160	mV	
$\Delta V_{O}$	Lood Degulation	I <sub>O</sub> = 5mA to 5/	A 3		16 8			32	160		
$\overline{\Delta I_0}$	Load Regulation		T <sub>J</sub> = Over Temp. Range <sup>1</sup>		32	160		64	320	mV	
Ι <sub>Q</sub>	Quiescent Current	I <sub>O</sub> = 5mA	T <sub>J</sub> = Over Temp. Range <sup>1</sup>			7			7	mA	
		I <sub>O</sub> = 5mA to 5/	4		10				10		
	Quiescent Current	T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>	10				10			
$\Delta I_Q$	Change	I <sub>O</sub> = 5mA	V <sub>IN</sub> = 17.5V to 35V			3			3	mA	
		T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>		3		3		3		
V	Dropout Voltage	I <sub>O</sub> = 5A	$\Delta V_{OUT} = 300 \text{mV}$		2.5	3		2.5	3	V	
V <sub>D</sub>		T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>		2.5						
		I <sub>O</sub> = 1A	f = 120Hz	50	70		50	70			
	Ripple Rejection	T <sub>J</sub> = Over Ten	np. Range <sup>1</sup>	50 70		50	70		dB		
	Thermal Regulation	t <sub>p</sub> = 20ms	ΔP = 50W		0.002	0.01		0.002	0.02	%/W	
I <sub>PEAK</sub>	Peak Output Current	V <sub>IN</sub> = 20V	T <sub>J</sub> = Over Temp. Range <sup>1</sup>		8	12		8	12	А	
	Short Circuit Current	V <sub>IN</sub> = 20V		3.5 2				3.5		Δ	
I <sub>SC</sub>		V <sub>IN</sub> = 35V						2		A	
e <sub>n</sub>	Output Noise Voltage				90			90		μV	
Б	Thermal Resistance	K Package			1.0	1.5		1.0	1.5	°C/W	
$R_{ extsf{ heta}JC}$	Junction to Case	V Package			1.0	1.5		1.0	1.5	C/W	

#### Notes

1) Applies over full temperature range:-

 $T_J = -55 \text{ to } +150^{\circ}\text{C} \text{ for } \text{IP1R18A} - 15 / \text{IP1R18} - 15$ 

 $T_{J} = 0$  to +125°C for IP3R18A-15 / IP3R18-15

All other specifications apply at  $T_{\rm J}$  = 25°C unless otherwise stated.

2) Test conditions unless otherwise stated:-

 $V_{IN} = 20V$ ,  $I_{OUT} = 2.5A$ .

Although Power Dissipation is internally limited, these specifications apply for Power Dissipation up to 50W.

3) Load and Line regulation are electrically independent and are measured using pulse techniques at low duty cycle in order to maintain constant junction temperature. To determine the effects on the output voltage due to device heating, refer to thermal regulation specification.