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International **ICR** Rectifier

Data SheetNo. PD60190-C

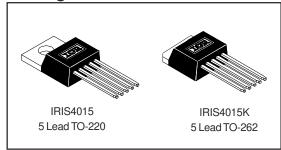
IRIS4015(K) INTEGRATED SWITCHER

Features

- Primary current mode control, and secondary voltage mode control
- Vcc Over-voltage protection (latched)
- Over-current & over-temperature protection
- Quasi resonant, variable frequency operation
- 5 pin TO-220 and TO-262 package
- 0.97Ω Rds(on) max/ 650V MOSFET
- Fully Characterized Avalanche Energy

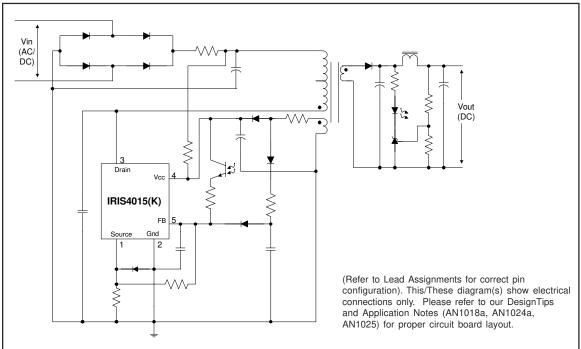
Descriptions

Packages



The IRIS4015(K) is a dual mode voltage and current controller combined with a MOSFET in a single package. The IRIS4015(K) is designed for use in AC/DC switching power supplies up to 230VAC nominal input, and is capable of 180W for a universal line input. The device operates on a quasi-resonant or Pulse Ratio Control (PRC) basis, and thereby variable frequency operation.

Typical Connection Diagram



Absolute Maximum Ratings

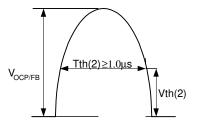
Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. All voltage parameters are absolute voltages referenced to terminals stated, all currents are defined positive into any lead. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions.

Symbol	Definition	Terminals	Max. Ratings	Units	Note
I _D peak	Peak drain current	3-1	21		Single pulse
I _D max	Maximum switching current	3-1	8	A	V ₂₋₃ = 0.78V Ta=-20 - +125°C
E _{AS}	Single pulse avalanche energy	3-1	325	mJ	single pulse I _I peak=5.7A
V _{CC}	Power supply voltage	4-3	35	v	
V _{TH}	OCP/FB terminal voltage	5-2	6	v	
P _{D1}	Power dissipation for MOSFET	3-1	235		With infinite heatsink
			1.2	W	Without heatsink
P _{D2}	Power dissipation for control part (MIC)	4-2	0.8	1	Specified by VIN x IIN
Rth _{JC}	Thermal resistance, junction to case	—	0.53	°C/W	
TJ	Junction temperature	—	-40-125		
T _S	Storage temperature	—	-40-125		
T _f	Internal frame temperature in operation	_	-20-125	°C	Refer to recommended operating temperature
T _{OP}	Ambient operating temperature	—	-20-125	1	
ΤL	Lead temp. (soldering, 10 seconds)	—	300		

Recommended Operating Conditions

Time for input of quasi resonant signals.

For the Quasi resonant signal inputted to the $V_{OCP/FB}$ terminal at the time of quasi resonant operation, the signal should be wider thant Tth(2)



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Electrical Characteristics (for Control Part (MIC)) V_{CC} = 18V, (T_A = 25°C) unless otherwise specified.

Symbol	Definition	Min.	Тур.	Max.	Units	Test Conditions
V _{CCUV+}	V _{CC} supply undervoltage positive going threshold	14.4	16	17.6	V	
V _{CCHYS}	V _{CC} supply undervoltage lockout hysteresis	5.4	6.0	6.6	v	
laccuv	UVLO mode quiescent current	_	_	100	μA V _{CC <} V _{CCUV-}	
lacc	Quiescent operating V _{CC} supply current	_	_	30	mA	
T _{OFF(MAX)}	Maximum OFF time	40	_	60		
T _{TH(2)}	Minimum input pulse width for quasi resonant signals	—	_	1.0	μsec	
T _{OFF(MIN)}	Minimum OFF time	_	_	1.5		
V _{TH(1)}	OCP/FB terminal threshold voltage 1	0.68	0.73	0.78	V	
V _{TH(2)}	OCP/FB terminal threshold voltage 2	1.3	1.45	1.6	v	
I _{OCP/FB}	OCP/FB terminal sink current	1.1	1.35	1.7	mA	
V _{CC(OVP)}	V _{CC} overvoltage protection limit	20.5	22.5	24.5	V	
I _{IN(H)}	Latch circuit sustaining current	—	—	400	μA	
V _{IN(LaOFF)}	Latch circuit reset voltage	6.6	_	8.4	V	
T _{J(TSD)}	Thermal shutdown activation temperature	140	—	—	°C	

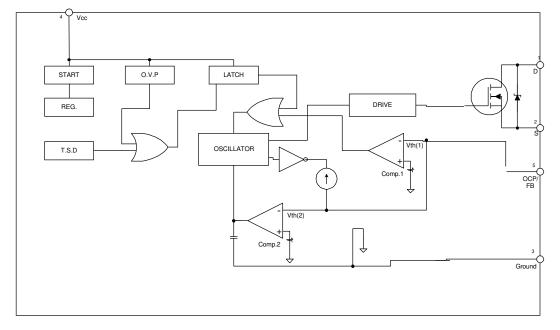
Electrical Characteristics (for MOSFET)

 $(T_A = 25^{\circ}C)$ unless otherwise specified.

Symbol	Definition	Min.	Тур.	Max.	Units	Test Conditions
V _{DSS}	Drain-to-source breakdown voltage	650	_	—	V	
I _{DSS}	Drain leakage current	—	_	25	μA	Vds=650V, V_{GS} =0V
R _{DS(ON)}	On-resistance	—	_	0.97	Ω	V ₃₋₁ =10V, I _D =8.8A
tr	Rise time (10% to 90%)	—	_	310	ns	
THj-C	Thermal resistance	—	—	0.53	°C/W	Between junction
						and case

International **IGR** Rectifier

Block Diagram



Lead Assignments	Pin #	Symbol	Description
	1	S	MOSFET Source terminal
	2	Ground	Ground terminal
	3	D	MOSFET Drain terminal
	4	Vcc	Control circuit supply voltage
1 2 3 4 5	5	OCP/FB	Overcurrent detection, and Voltage mode control feedback signal

Other Functions

O.V.P. – Overvoltage Protection Circuit T.S.D. – Thermal Shutdown Circuit

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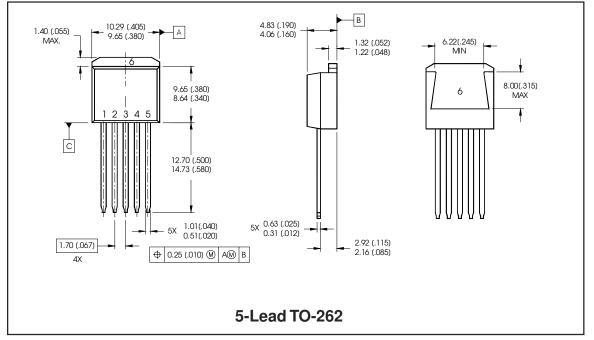
International

10.54 [.415] В Α 9.91 [.390] Ø 3.96 [.156] 3.53 [.139] 4.82 [.190] 2.94 [.116] 4.19 [.165] 2.54 [.100] 1,39 [.055] 1 0.89 [.035] 6.60 [.260] 6.00 [.236] I 15.87 [.625] T 14.48 [.570] С 1 2 3 4 5 14.09 [.555] 13.59 [.535] 5X 0.63 [.025] 0.31 [.012] 1.01 [.040] 5X 0,51 [.020] 1.70 [.067] 2.92 [.115] 2.16 [.085] 4X NOTES: 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994. 2. CONTROLLING DIMENSION: INCH. 3. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES]. 4. OUTLINE SIMILAR TO JEDEC OUTLINE SERIES TS-001. 01-6020 00 01-3042 01 (TS-001) 5-Lead TO-220

Case outline

International

Case outline



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