

## AUIPS6041(G)(R)(S)

### INTELLIGENT POWER HIGH SIDE SWITCH

#### Features

- Over temperature shutdown (with auto-restart)
- Short circuit protection (current limit)
- Reverse battery protection (turns On the MOSFET)
- Full diagnostic capability (short circuit to battery)
- Active clamp
- Open load detection in On and Off state
- Ground loss protection
- Logic ground isolated from power ground
- ESD protection
- Lead Free and RoHS compliant

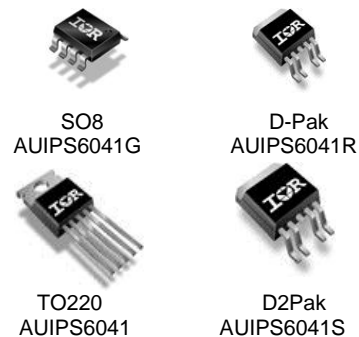
#### Description

The AUIPS6041(G)(R)(S) is a five terminal Intelligent Power Switch (IPS) for use in a high side configuration. It features short circuit, over-temperature, ESD protection, inductive load capability and diagnostic feedback. The output current is limited to the  $I_{lim}$  value. The current limitation is activated until the thermal protection acts. The over-temperature protection turns off the device if the junction temperature exceeds the  $T_{shutdown}$  value. It will automatically restart after the junction has cooled  $7^{\circ}\text{C}$  below the  $T_{shutdown}$  value. The reverse battery protection turns On the MOSFET. A diagnostic pin provides different voltage levels for each fault condition. The double level shifter circuitry will allow large offsets between the logic and load ground.

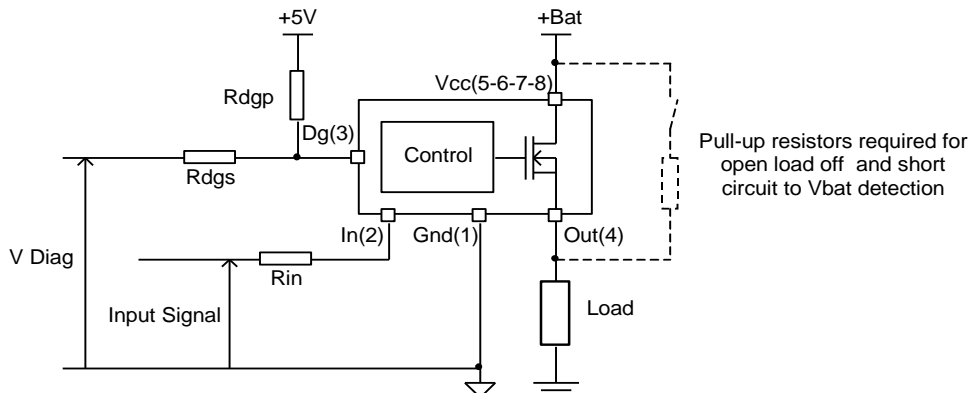
#### Product Summary

$R_{ds(on)}$	130m $\Omega$ max.
$V_{clamp}$	39V
$I_{Limit}$	7A
Open load	3V / 0.22A

#### Packages



#### Typical Connection



## Qualification Information<sup>†</sup>

Qualification Level		Automotive (per AEC-Q100 <sup>††</sup> )
		Comments: This family of ICs has passed an Automotive qualification. IR's Industrial and Consumer qualification level is granted by extension of the higher Automotive level.
Moisture Sensitivity Level	D2PAK-5L	MSL1, 260°C (per IPC/JEDEC J-STD-020)
	TO-220	Not applicable (non-surface mount package style)
	DPAK-5L	MSL1, 260°C (per IPC/JEDEC J-STD-020)
	SOIC-8L	MSL2, 260°C (per IPC/JEDEC J-STD-020)
ESD	Machine Model	Class M2 (+/-150V) <sup>†††</sup> (per AEC-Q100-003)
	Human Body Model	Class H1C (+/-1500V) <sup>†††</sup> (per AEC-Q100-002)
	Charged Device Model (SOIC, DPAK, D2PAK)	Class C4 (+/-900V) <sup>†††</sup> (per AEC-Q100-011)
	Charged Device Model (TO220)	Class C3B (+/-750V) <sup>†††</sup> (per AEC-Q100-011)
IC Latch-Up Test		Class II, Level A (per AEC-Q100-004)
RoHS Compliant		Yes

† Qualification standards can be found at International Rectifier's web site <http://www.irf.com/>

†† Exceptions to AEC-Q100 requirements are noted in the qualification report.

††† Passing voltage level

## Absolute Maximum Ratings

Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. All voltage parameters are referenced to Ground lead.  $T_j = -40^{\circ}\text{C}..150^{\circ}\text{C}$ ,  $V_{cc}=6..35\text{V}$  (unless otherwise specified).

Symbol	Parameter	Min.	Max.	Units
Vout	Maximum output voltage	$V_{cc}-35$	$V_{cc}+0.3$	V
Voffset	Maximum logic ground to load ground offset	$V_{cc}-35$	$V_{cc}+0.3$	
Vin	Maximum input voltage	-0.3	5.5	
Vcc max.	Maximum Vcc voltage	—	36	
Vcc cont.	Maximum continuous Vcc voltage	—	28	
Iin max.	Maximum IN current	-3	10	mA
I <sub>dg</sub> max.	Maximum diagnostic output current	-3	10	
V <sub>dg</sub>	Maximum diagnostic output voltage	-0.3	5.5	V
Pulse 2a max	Maximum voltage ISO pulse 2a x 500cy (ISO7637)	—	55	V
Pd	Maximum power dissipation (internally limited by thermal protection) R <sub>th</sub> =100°C/W AUIPS6041G	—	1.25	W
	R <sub>th</sub> =50°C/W AUIPS6041R 1" sqrt. footprint	—	2.5	
T <sub>j</sub> max.	Max. storage & operating temperature junction temperature	-40	150	°C

## Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Units
R <sub>th1</sub>	Thermal resistance junction to ambient AUIPS6041G	100	—	°C/W
R <sub>th1</sub>	Thermal resistance junction to ambient AUIPS6041R D-Pak std. footprint	70	—	
R <sub>th2</sub>	Thermal resistance junction to ambient AUIPS6041R D-Pak 1" sqrt. footprint	50	—	
R <sub>th3</sub>	Thermal resistance junction to case AUIPS6041(R)(S) D-Pak/D2pak/TO220	6	—	
R <sub>th1</sub>	Thermal resistance junction to ambient AUIPS6041(S) D2Pak/TO220 std. footprint	60	—	
R <sub>th2</sub>	Thermal resistance junction to ambient AUIPS6041S D2Pak 1" sqrt. footprint	40	—	

## Recommended Operating Conditions

These values are given for a quick design. For operation outside these conditions, please consult the application notes.

Symbol	Parameter	Min.	Max.	Units
V <sub>IH</sub>	High level input voltage	4	5.5	
V <sub>IL</sub>	Low level input voltage	0	0.9	
I <sub>out</sub>	Continuous drain current, T <sub>ambient</sub> =85°C, T <sub>j</sub> =125°C, V <sub>in</sub> =5V R <sub>th</sub> =100°C/W AUIPS6041G R <sub>th</sub> =50°C/W AUIPS6041R 1" sqrt. footprint	— —	1.6 2.3	A
R <sub>in</sub>	Recommended resistor in series with IN pin	4	10	
R <sub>dgs</sub>	Recommended resistor in series with DG pin for reverse battery protection	4	20	kΩ
R <sub>dgp</sub>	Recommended pull-up resistor for DG	4	20	
R <sub>ol</sub>	Recommended pull-up resistor for open load detection	5	100	
F max.	Max. switching frequency	—	3.5	kHz

## Static Electrical Characteristics

$T_j = -40^{\circ}\text{C}..150^{\circ}\text{C}$ ,  $V_{cc} = 6..28\text{V}$  (unless otherwise specified), typical values are given for  $V_{cc} = 14\text{V}$  and  $T_j = 25^{\circ}\text{C}$

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Rds(on)	ON state resistance $T_j = 25^{\circ}\text{C}$	—	110	130	mΩ	$V_{in} = 5\text{V}$ , $I_{out} = 2.5\text{A}$
	ON state resistance $T_j = 150^{\circ}\text{C}$	—	190	230		$V_{in} = 5\text{V}$ , $I_{out} = 2.5\text{A}$
	ON state resistance $T_j = 25^{\circ}\text{C}$ , $V_{cc} = 6\text{V}$	—	125	155		$V_{in} = 5\text{V}$ , $I_{out} = 1.5\text{A}$
	ON state resistance during reverse battery $T_j = 25^{\circ}\text{C}$	—	140	180		$V_{cc} - Gnd = -14\text{V}$
Vcc op.	Operating voltage range	6	—	28	V	
V clamp 1	Vcc to Out clamp voltage 1	37	39	43		$I_{out} = 20\text{mA}$
V clamp 2	Vcc to Out clamp voltage 2	—	40	—		$I_{out} = 2.5\text{A}$ (see Fig. 1)
Icc Off	Supply current when Off and with Vout connected to ground Rconnection <4Ω	—	4	9	μA	$V_{in} = 0\text{V}$ , $V_{out} = 0\text{V}$ , $T_j = 25^{\circ}\text{C}$ , $V_{cc} = 14\text{V}$
Icc On	Supply current when On	—	2.2	5	mA	$V_{in} = 5\text{V}$ , $V_{cc} = 14\text{V}$
Vih	Input high threshold voltage	—	2.5	3	V	
Vil	Input low threshold voltage	1.5	2	—		
In hyst.	Input hysteresis	0.2	0.5	1		
Iin On	Input current when device is On	—	40	100	μA	$V_{in} = 5\text{V}$
I <sub>dg</sub>	Dg leakage current	—	0.1	10		$V_{dg} = 5\text{V}$
V <sub>dg</sub>	Low level DG voltage	—	0.25	0.4	V	$I_{dg} = 1.6\text{mA}$

## Switching Electrical Characteristics

$V_{cc} = 14\text{V}$ , Resistive load =  $6\Omega$ ,  $V_{in} = 5\text{V}$ ,  $T_j = -40^{\circ}\text{C}..150^{\circ}\text{C}$ , typical values are given for  $T_j = 25^{\circ}\text{C}$

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Tdon	Turn-on delay time	—	5	15	μs	see Fig. 3
Tr1	Rise time to Vout=Vcc-5V	—	3	10		
Tr2	Rise time to Vout=0.9 x Vcc	—	4	30		
dV/dt (On)	Turn On dV/dt	—	2.5	—	V/μs	
EOn	Turn On energy	—	100	—	μJ	
Tdoff	Turn-off delay time	—	10	20	μs	
Tf	Fall time to Vout=0.1 x Vcc	—	3	10		
dV/dt (Off)	Turn Off dV/dt	—	6.5	—		
EOff	Turn Off energy	—	50	—	μJ	

## Protection Characteristics

$T_j = -40^{\circ}\text{C} \dots 150^{\circ}\text{C}$ ,  $V_{cc} = 6 \dots 28\text{V}$  (unless otherwise specified), typical values are given for  $V_{cc} = 14\text{V}$  and  $T_j = 25^{\circ}\text{C}$

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ilim	Internal current limit	4	7	10	A	$V_{out} = 0\text{V}$ , $T_j = 25^{\circ}\text{C}$
Tsd+	Over temperature high threshold	150(1)	165	—	$^{\circ}\text{C}$	See fig. 2
Tsd-	Over temperature low threshold	—	158	—		
Vsc	Short-circuit detection voltage(2)	2	3	4	V	
UV+		—	5	6.2		
UV -		—	4.5	5.8		
VOL Off	Open load detection threshold	2	3	4		
I OL On	Open load detection threshold	0.05	0.17	0.27	A	$T_j = -40 \dots 25^{\circ}\text{C}$
		0.05	0.15	0.22		$T_j = 25 \dots 150^{\circ}\text{C}$

(1) Guaranteed by design

(2) Reference to  $V_{cc}$

## True Table

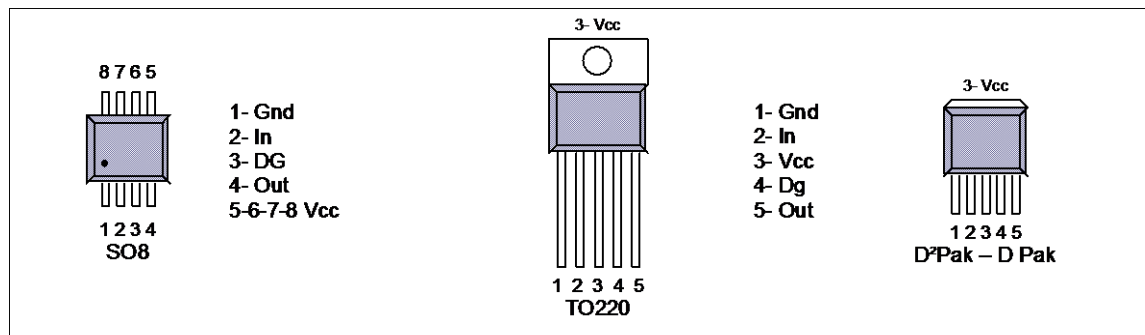
Operating Conditions	IN	OUT	DG
Normal	H	H	H
Normal	L	L	H
Open Load	H	H	L
Open Load (3)	L	H	L
Short circuit to Gnd	H	L	L
Short circuit to Gnd	L	L	H
Short circuit to $V_{cc}$	H	H	L (4)
Short circuit to $V_{cc}$ (5)	L	H	L
Over-temperature	H	L	L
Over-temperature	L	L	H

(3) With a pull-up resistor connected between the output and  $V_{cc}$ .

(4)  $V_{ds}$  lower than  $10\text{mV}$ .

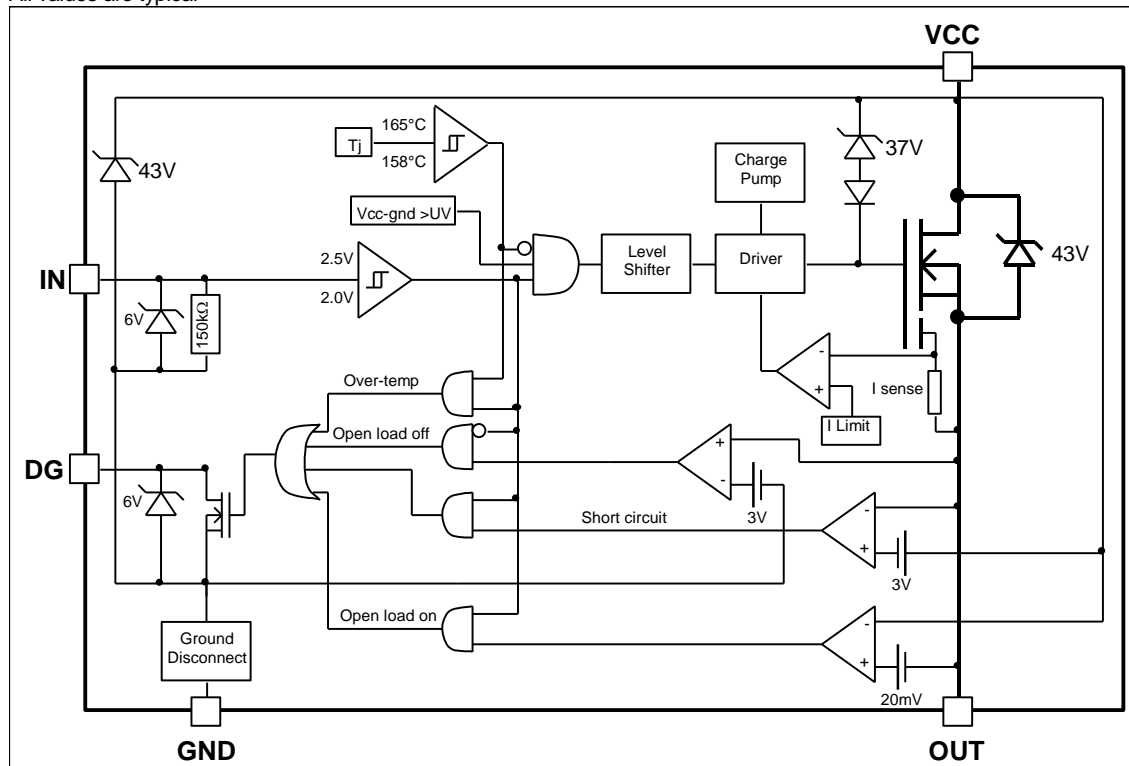
(5) Without a pull-up resistor connected between the output and  $V_{cc}$ .

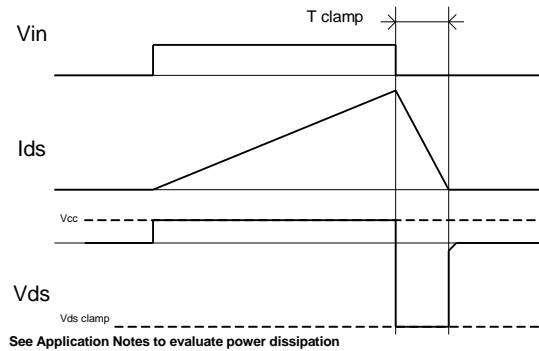
## Lead Assignments



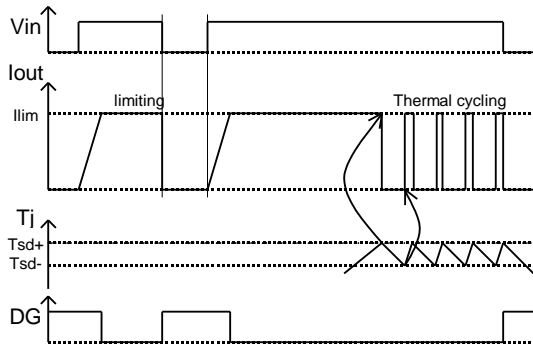
## Functional Block Diagram

All values are typical

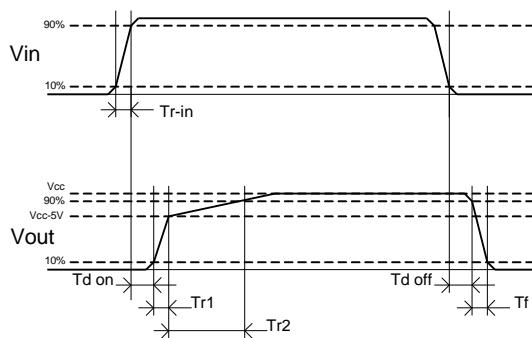




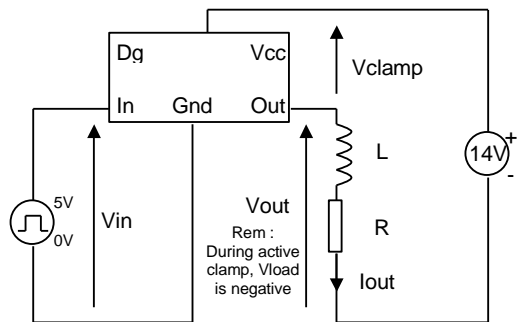
**Figure 1 – Active clamp waveforms**



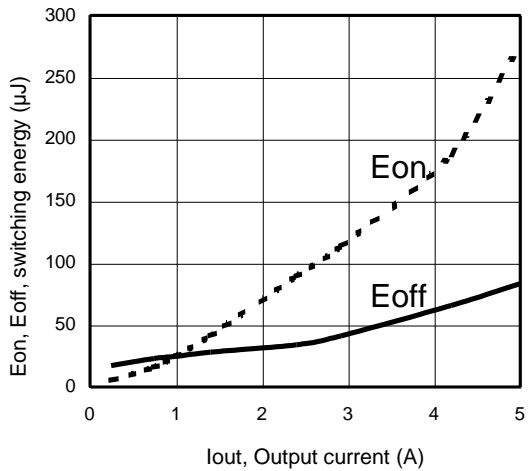
**Figure 2 – Protection timing diagram**



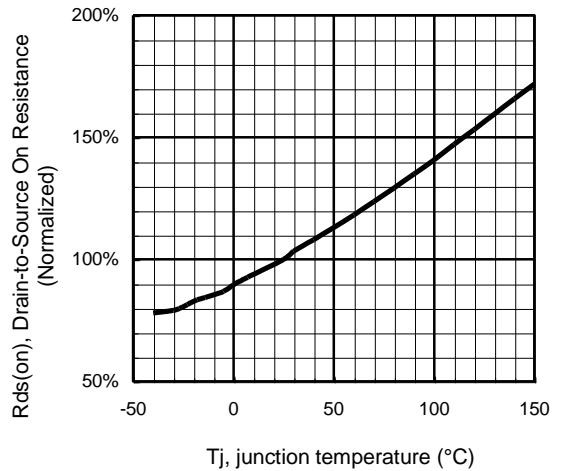
**Figure 3 – Switching times definitions**



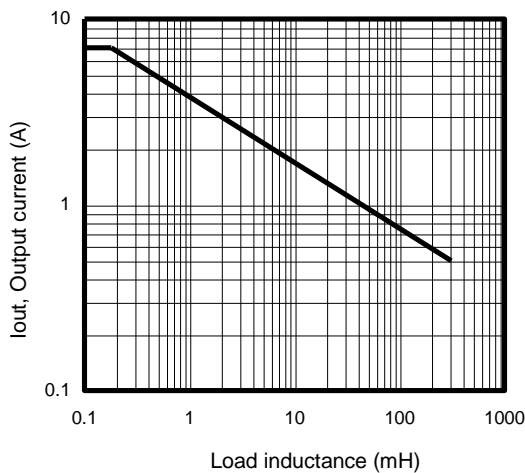
**Figure 4 – Active clamp test circuit**



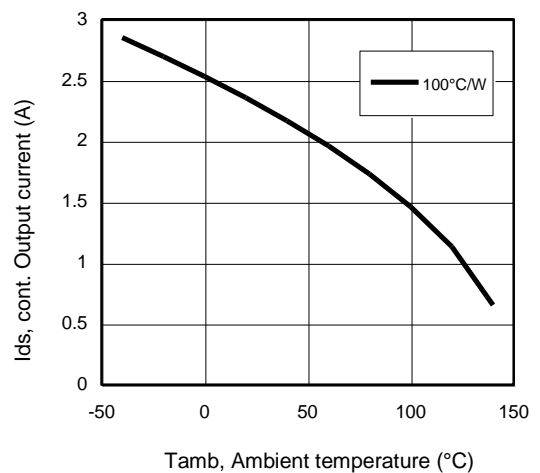
**Figure 5 – Switching energy ( $\mu J$ ) Vs Output current (A)**



**Figure 6 - Normalized  $R_{ds(on)}$  (%) Vs  $T_j$  ( $^{\circ}C$ )**

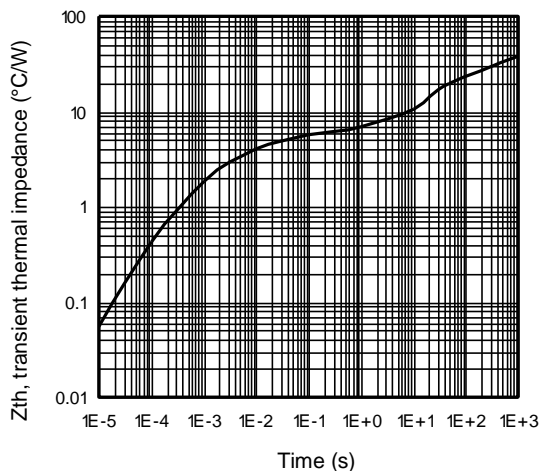


**Figure 7 – Max. Output current (A) Vs Load inductance (mH)**

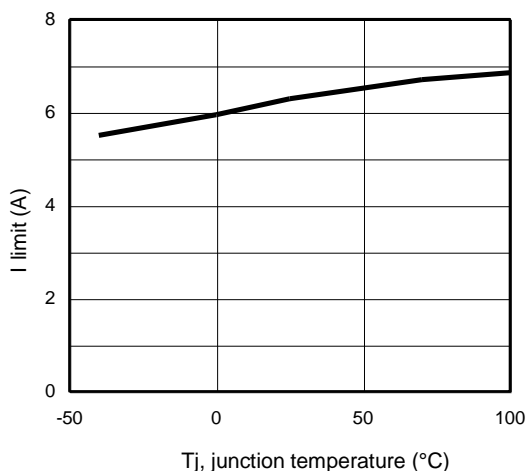


**Figure 8 – Max. output current (A) Vs Ambient temperature ( $^{\circ}C$ )**

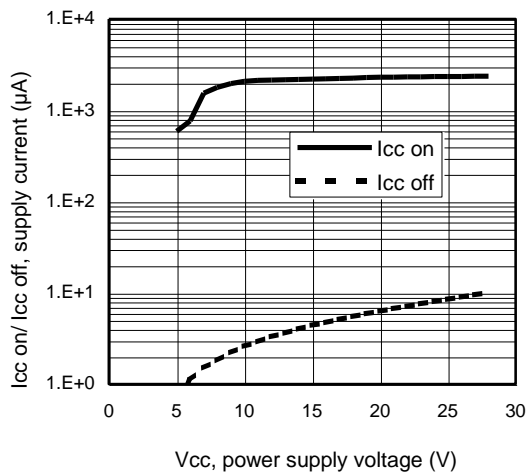




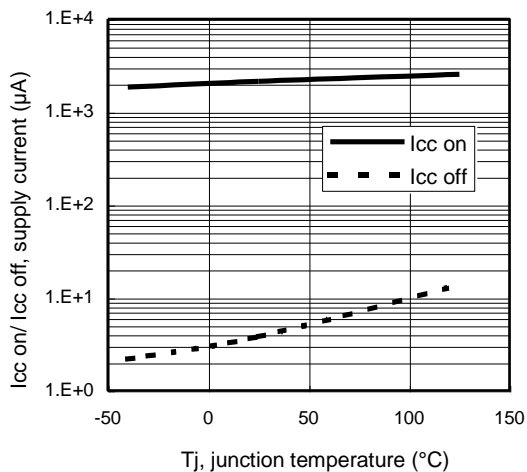
**Figure 9 – Transient thermal impedance (°C/W)  
Vs time (s)**



**Figure 10 – I limit (A)  
Vs junction temperature (°C)**



**Figure 11 – Icc on/ Icc off (µA) Vs Vcc (V)\***

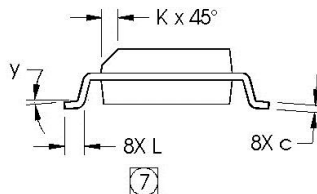
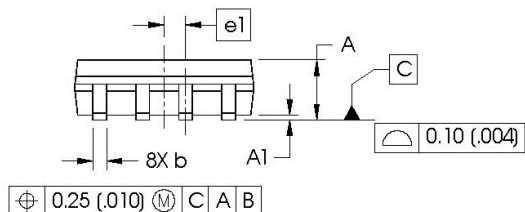
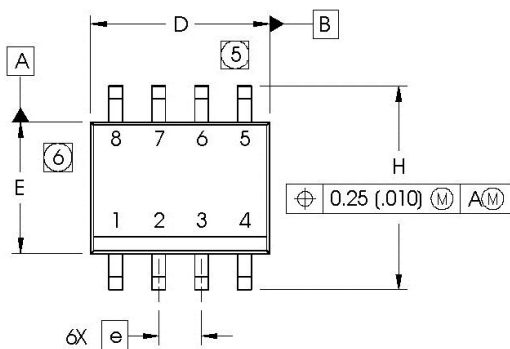


**Figure 12 – Icc on/ Icc off (µA) Vs Tj (°C)\***

\*Vout connected to ground with  $R < 4\Omega$

## Case Outline – SO8

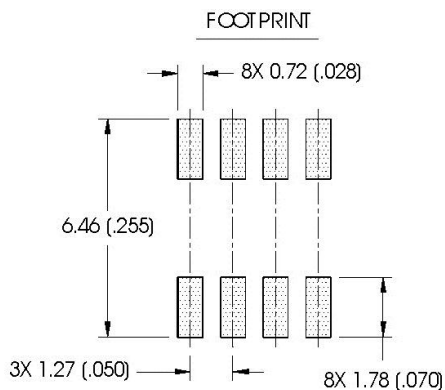
Dimensions are shown in millimeters (inches)



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
AI	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27
y	0°	8°	0°	8°

### NOTES:

1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 (.010).
7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

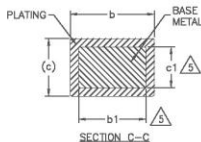
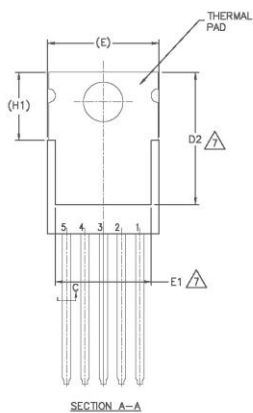
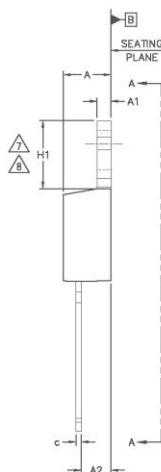
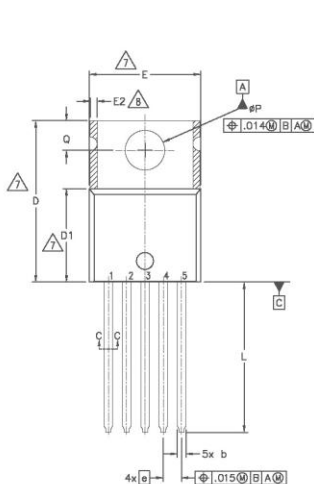


[illegible]

1. 10 sprocket hole pitch cumulative tolerance 0.2
2. Camber not to exceed 1mm in 100mm
3. Material: Black Conductive Advantek Polystyrene
4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

- All Dimensions in Millimeters -

## Case Outline - TO220 (5 leads)

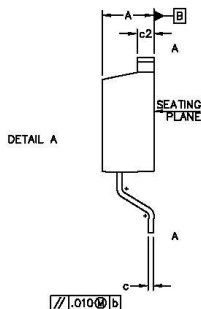
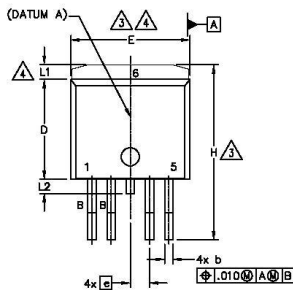
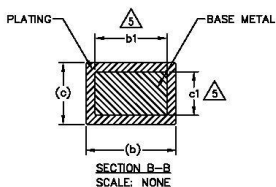
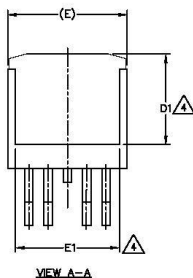
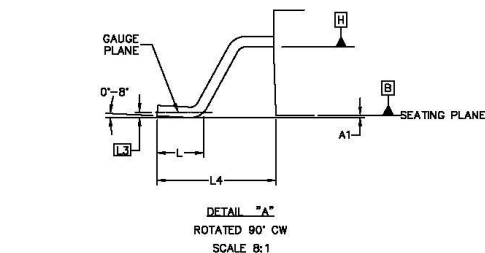


SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	3.56	4.83	.140	.190	
A1	0.51	1.40	.020	.055	
A2	2.03	2.92	.080	.115	
b	0.64	0.89	.025	.035	5
b1	0.64	0.84	.025	.033	
c	0.36	0.61	.014	.024	
c1	0.36	0.56	.014	.022	5
D	14.22	16.51	.560	.650	4
D1	8.38	9.02	.330	.355	
D2	11.68	12.88	.460	.507	7
E	9.65	10.67	.380	.420	4,7
E1	6.86	8.89	.270	.350	7
E2	—	0.76	—	.030	8
e	1.70 BSC		.067 BSC		
H1	5.84	6.86	.230	.270	7,8
L	12.70	14.73	.500	.580	
W	3.53	3.73	.139	.147	
Q	2.54	3.05	.100	.120	

### NOTES:

- 1.— DIMENSIONING AND TOLERANCING AS PER ASME Y14.5 M— 1994.
- 2.— DIMENSIONS ARE SHOWN IN INCHES [MILLIMETERS].
- 3.— LEAD DIMENSION AND FINISH UNCONTROLLED IN L1.
- 4.— DIMENSION D, D1 & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
- 5.— DIMENSION b1 & c1 APPLY TO BASE METAL ONLY.
- 6.— CONTROLLING DIMENSION : INCHES.
- 7.— THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS E,H1,D2 & E1.
- 8.— DIMENSION E2 X H1 DEFINE A ZONE WHERE STAMPING AND SINGULATION IRREGULARITIES ARE ALLOWED.
- 9.— OUTLINE CONFORMS TO JEDEC TO-220, EXCEPT A2 (max.) AND D2 (min.) WHERE DIMENSIONS ARE DERIVED FROM THE ACTUAL PACKAGE OUTLINE.
- 10.— LEADS AND DRAIN ARE PLATED WITH 100% Sn

## Case Outline 5 Leads - D2PAK



### NOTES:

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M-1994
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [0.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY AT DATUM H.
4. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSION E, L1, D1 & E1.
5. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.
6. DATUM A & B TO BE DETERMINED AT DATUM PLANE H.
7. CONTROLLING DIMENSION: INCH.
8. OUTLINE CONFORMS TO JEDEC OUTLINE TO-263BA.
9. LEADS AND DRAIN ARE PLATED : 100% Sn

SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	.160	.190	4
A1	—	0.254	—	.010	
b	0.51	0.89	.020	.039	
b1	0.51	0.89	.020	.035	
c	0.38	0.74	.015	.029	4
c1	0.38	0.58	.015	.023	
c2	1.14	1.65	.045	.065	3
D	8.38	9.65	.330	.380	
D1	6.86	—	.270	—	3
E	9.65	10.67	.380	.420	
E1	6.22	—	.245	—	3
e	1.70	BSC	.067	BSC	
H	14.61	15.88	.575	.625	3
L	1.78	2.79	.070	.110	
L1	—	1.68	—	.066	3
L2	—	1.78	—	.070	
L3	0.25	BSC	.010	BSC	3
L4	4.78	5.28	.188	.208	

Technical drawing of a circular component with three lobes. The drawing includes a top view, a side view, and a detail view of the TRR (Top Right Rear) corner.

**Top View Dimensions:**

- Overall diameter: 60.00 [1.173] MAX.
- Inner diameter: 12.80 [.504]
- Outer diameter of lobes: 13.52 [.532]
- Distance from center to lobe tip: 16.10 [.534]
- Distance from center to lobe base: 10.90 [.429]
- Distance from center to lobe base (alternative): 10.70 [.421]
- Distance from lobe base to lobe tip: 11.60 [.457]
- Distance from lobe base to lobe tip (alternative): 11.40 [.449]
- Distance from lobe base to lobe tip (alternative): 11.60 [.457]
- Distance from lobe base to lobe tip (alternative): 11.40 [.449]

**Side View Dimensions:**

- Overall height: 24.30 [.957]
- Height of lobe: 23.90 [.941]
- Height of lobe (alternative): 24.30 [.957]
- Height of lobe (alternative): 23.90 [.941]
- Height of lobe (alternative): 24.30 [.957]
- Height of lobe (alternative): 23.90 [.941]

**TRR Detail View Dimensions:**

- Overall width: 1.60 [.063]
- Overall height: 1.50 [.059]
- Distance from center to lobe tip: 1.85 [.073]
- Distance from center to lobe base: 1.65 [.065]
- Distance from lobe base to lobe tip: 1.60 [.063]
- Distance from lobe base to lobe tip (alternative): 1.50 [.059]
- Distance from lobe base to lobe tip (alternative): 1.60 [.063]
- Distance from lobe base to lobe tip (alternative): 1.50 [.059]

**Notes:**

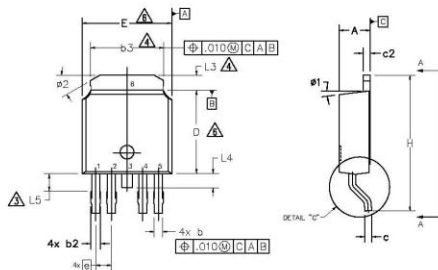
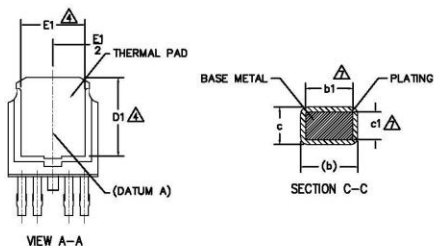
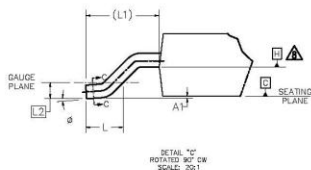
- OUTLINE CONFORMS TO EIA-41
- DIMENSIONS ARE SHOWN IN MILLIMETERS

NOTES:

1. OUTLINE CONFORMS TO EIA-4B1 & EIA-541.
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].

01-3071 00 / 01-3072 00

## Case Outline 5 Leads – DPAK



SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	2.18	2.39	.086	.094	2
A1	—	0.13	—	.005	
b	0.56	0.79	.022	.031	2
b1	.056	0.74	.022	.029	
b2	0.65	0.89	.026	.035	2
b3	4.95	5.46	.195	.215	
c	0.46	0.61	.018	.024	2
c1	0.41	0.56	.016	.022	
c2	0.46	0.89	.018	.035	3
D	5.97	6.22	.235	.245	
D1	5.21	—	.205	—	3
E	6.35	6.73	.250	.265	
E1	4.32	—	.170	—	3
e	1.14 BSC		.045 BSC		
H	9.40	10.41	.370	.410	3
L	1.40	1.78	.055	.070	
L1	2.74 BSC		.108 REF.		
L2	0.51 BSC		.020 BSC		
L3	0.89	1.27	.035	.050	3
L4	—	1.02	—	.040	
L5	1.14	1.52	.045	.060	3
ø	0"	10"	0"	10"	
ø1	0"	15"	0"	15"	3
ø2	28"	32"	28"	32"	

### NOTES:

- 1.— DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M-1994
- 2.— DIMENSIONS ARE SHOWN IN INCHES [MILLIMETERS]
- 3.— LEAD DIMENSION UNCONTROLLED IN L5.
- 4.— DIMENSION D1, E1, L3 & b3 ESTABLISH A MINIMUM MOUNTING SURFACE FOR THERMAL PAD.
- 5.— SECTION C-C DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN .005 AND 0.10 [0.13 AND 0.25] FROM THE LEAD TIP.
- 6.— DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005 [0.13] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
- 7.— DIMENSION b1 & c1 APPLIED TO BASE METAL ONLY.
- 8.— DATUM A & B TO BE DETERMINED AT DATUM PLANE H.
- 9.— OUTLINE CONFORMS TO JEDEC OUTLINE TO-252.
- 10.— LEADS AND DRAIN ARE PLATED WITH 100% Sn

The technical drawing consists of two views of a mechanical component.

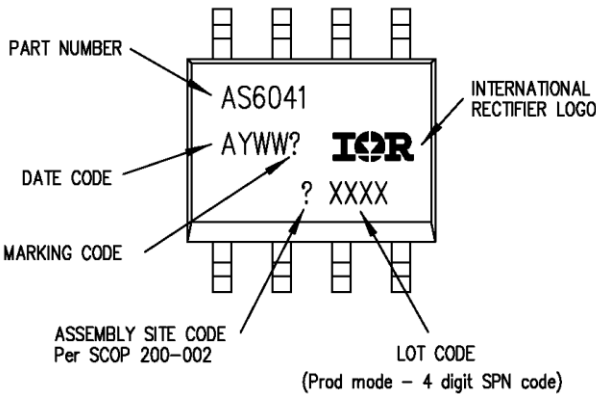
- Top View (Left):** Shows a cross-section of the part. It features a central vertical axis with dimensions:
  - A top radius dimension of  $0.30 \pm 0.05$ .
  - A maximum outer radius dimension of  $0.3 \text{ R MAX}$ .
  - An inner diameter feature labeled  $Ko$  with a circled 'C' next to it.
  - An outer diameter feature labeled  $K1$ .
- Side View (Right):** Shows the length of the part along its horizontal axis. Key features include:
  - A total length dimension of  $2.0$ .
  - A distance from the left end to the first hole of  $4.0$ .
  - A series of holes along the top surface, with a center-to-center distance between some holes labeled  $P1$ .
  - A section line labeled **SECTION A-A** passing through the part.
  - A fillet or transition radius dimensioned as  $0.5 \text{ R TYP.}$ .
  - A distance from the right end to the last hole of  $1.75$ .
  - A reference to "SEE NOTE 6" pointing to a specific area.
  - A width dimension labeled  $W$  at the far right.
  - A distance from the bottom edge to the first hole of  $1.2$ .
  - A minimum thickness dimension of  $1.5 \text{ MIN}$  near the bottom edge.
  - A distance from the left end to the first hole of  $5.5$ .
  - A feature labeled  $Bo$  with a circled 'C' next to it.
  - A feature labeled  $Ao$  with a circled 'C' below it.
  - A feature labeled  $A$  with arrows pointing to specific points on the top surface.

1. 10 SPROCKET HOLE PUNCH CUMULATIVE TOLERANCE  $\pm 0.02$
2. CAMBER NOT TO EXCEED 1mm in 100mm
3. MATERIAL: CONDUCTIVE BLACK POLYSTYRENE
4.  $A_0$  AND  $B_0$  MEASURED ON A PLANE 0.3mm ABOVE THE BOTTOM OF THE POCKET
5.  $K_0$  MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE OF THE CARRIER
6. POCKET POSITION RELATIVE TO THE SPROCKET HOLE MEASURED AS TRUE POSITION OF POCKET, NOT POCKET HOLE
7. VENDOR: (OPTIONAL)
8. MUST ALSO MEET REQUIREMENTS OF EIA STANDARD #EIA-481A, TAPING OF SURFACE-MOUNT COMPONENTS FOR AUTOMATIC PLACEMENT.
9. TOLERANCE TO BE MANUFACTURER STANDARD
10. SURFACE RESISTIVITY OF MOLDED MATL: MUST MEASURE LESS THAN OR EQUAL TO  $10^4$  OHMS PER SQUARE, MEASURED IN ACCORDANCE TO PROCEDURE GIVEN IN ASTM D-257 & ASTM D-991 (REF. C-9000 SPEC.)
11. TOTAL LENGTH PER REEL MUST BE 79 METERS
12. © CRITICAL DIMENSION

Ao = 10.5 mm  
 Bo = 7.0 mm  
 Ko = 2.8 mm  
 K1 = 2.4 mm  
 F = 7.5 mm  
 P1 = 12.0 mm  
 W = 16.0 ± .3 mm







Ordering Information

Base Part Number	Package Type	Standard Pack		Complete Part Number
		Form	Quantity	
AUIPS6041	TO220-5-Leads	Tube	50	AUIPS6041
AUIPS6041S	D2-Pak-5-Leads	Tube	50	AUIPS6041S
		Tape and reel left	800	AUIPS6041STRL
		Tape and reel right	800	AUIPS6041STRR
AUIPS6041R	D-Pak-5-Leads	Tube	75	AUIPS6041R
		Tape and reel	2000	AUIPS6041RTR
		Tape and reel left	3000	AUIPS6041RTRL
		Tape and reel right	3000	AUIPS6041RTRR
AUIPS6041G	SOIC-8	Tube	95	AUIPS6041G
		Tape and reel	2500	AUIPS6041GTR

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## Revision History

Revision	Date	Notes/Changes
C	Februrary, 28th 2009	AU number update
D	March, 14th 2011	AU release
F	May 15, 2012	Add the test condition for the ICC (off) parameters