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Process Change Notification

This is a revised notice from previous PCN sent to clarify the differences in “FIT” due to minor package outline dimensional differences.

Date: **Tuesday, February 03, 2015**

PCR Reference: **Previous PCN # S20857 & 288-PCN-90**

PCN Reference: **288-PCN90-Public**

To Our Value Customer:

As always we appreciate your use of International Rectifier semiconductor products. Our commitment to customer satisfaction and continuous improvement is demonstrated by our change plans to enhance capacity, quality and reliability. This revised notice is to inform you that the previous PCN sent did not disclose minor dimensional differences between current and future alternative assembly house although they both meet JEDEC. IR needs your help to review this change and advice ASAP if it is acceptable for your assembly application. Please review the details in the impact section of this notification and advise if change is acceptable. The JEDEC outline is met in both package outlines, but need your review of differences and advice.

Type of Change Notification:

Clarification of previous PCN sent regarding Alternative Assembly site to define the Package Outline Dimension (POD) and footprint differences from current to additional assembly site for PQFN 5x6 Cu Clip FET products.

Description of Change:

Power Management Devices– PQFN 5x6 FETs -ASE-Weihai (China) is the alternate assembly

ASE-Weihai (China) is the alternate assembly site for the part numbers identified in the following table. The Bill of Materials has changed in Cu wire, Mold compound, Die attach material as follows:

Material	Before	After
Die attach	92.5Pb5Sn2.5Ag	95.5Pb2Sn2.5Ag
Wire	1.3mil Cu wire	2mil Cu wire
Source interconnect	Cu clip	Cu clip

Mold compound	Material # 44-0851	Material # 44-1378
Lead finish	100Sn Matte	100Sn Matte

Reason for the Change:

Additional assembly capacity.

Effect Date:

Monday, May 04, 2015

International Rectifier will consider this change approved and will implement it by the effective date unless specific conditions of acceptance or data requests are provided in writing within 30 days of receipt of this notice. Please submit conditions of acceptance and data requests to the PCN coordinator listed at the end of this notice.

Impact of Change:

The package outline dimensions (POD) and footprint will be slightly different at the new assembly site. Product Datasheets will be revised to reflect the differences. The new assembly site will meet the same qualification level as the existing assembly site. Package Outline Dimensions (POD) and Footprint assessment: Please see POD Assessment addendum, à^|[¸ Áfor more details.

Method of Identifying Changed Product:

The package outline dimensions (POD) and footprint will be slightly different

Products Affected:

IR Part	Description
62-0215PBF	
IRFH5004TRPBF	MOSFET, 40V, 100A, 2.6 mOhm, 73 nC Qg, PQFN
IRFH5006TRPBF	MOSFET, 60V, 100A, 4.1mOhm, 67 nC Qg, PQFN5x6
IRFH5007TRPBF	MOSFET, 70V, 100A, 5.9mOhm, 65 nC Qg, PQFN5x6
IRFH5010TRPBF	MOSFET, 100V, 100A, 9.0 mOhm, 65 nC Qg, PQFN 5x6
IRFH5015TRPBF	MOSFET, 150V, 56A, 31 mOhm, 33 nC Qg, PQFN
IRFH5020TRPBF	MOSFET, 200V, 41A, 59 mOhm, 36 nC Qg, PQFN
IRFH5025TRPBF	MOSFET, 250V, 31A, 104 mOhm, 36 nC Qg, PQFN 5x6
IRFH5250DTRPBF	MOSFET, 25V FETky, 100A, 1.4 mOhm, 39 nC Qg, PQFN
IRFH5250TRPBF	MOSFET, 25V, 100A, 1.15 mOhm, 52 nC Qg, PQFN 5x6
IRFH5300TRPBF	MOSFET, 30V, 100A, 1.4 m¿ max, 50 nC Qg, PQFN 5x6
IRFH6200TRPBF	MOSFET, 20V, 100A, 1.2 mOhm, 155 nC Qg, 2.5V drive capable, PQFN5x6
IRFH8202TRPBF	

IRFH8307TRPBF	
IRLH5030TRPBF	MOSFET, 100V, 100A, 9.0 mOhm max, 44 nC Qg, PQFN, Logic Level
IRLH5034TRPBF	MOSFET, 40V, 100A, 2.4 mOhm max, 43 nC Qg, PQFN 5x6, Logic Level
IRLH5036TRPBF	MOSFET, 60V, 100A, 4.4 mOhm max, 44 nC Qg, PQFN 5x6, Logic Level

Qualification:

Parts passed all the reliability testing requirements. Reliability qualification report is available upon request. Qualification standards can be found on International Rectifier's web site at www.irf.com/product-info/reliability

Supporting Data Availability:

Contact IR for supporting data on this change.

Contact Information:

CONTACT TYPE	NAME	PHONE	EMAIL
PCN Coordinator	Mark Ogden		mogden1@irf.com
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IOR International Rectifier

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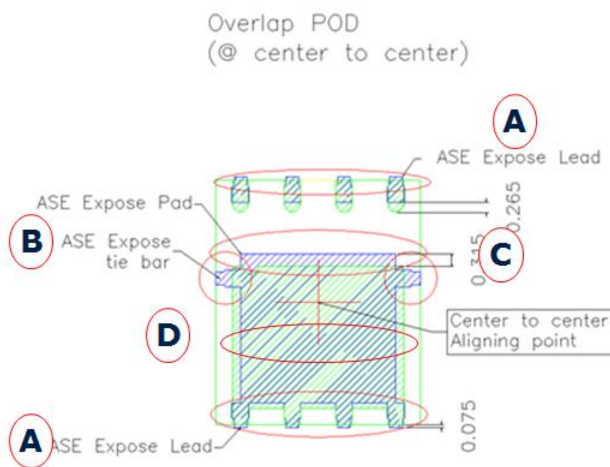
Package Outline Dimension (POD) and footprint assessment

The following pages show detailed information regarding the differences in the package outline and footprint of Carsem and ASEW products.

The figure below shows the overlapping of the package footprint from both assembly sites.
Carsem: Green schematic
ASE-W: Blue schematic



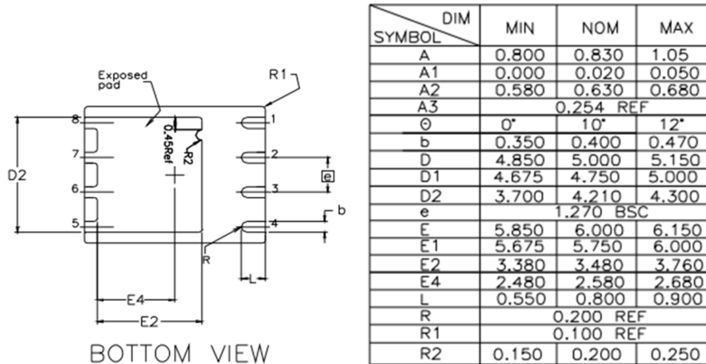
	Description	Assessment
A	Lead Length	ASE exposed lead is smaller than Carsem
B	Tie bar	Carsem does not have exposed tie bar
C	E2 paddle	ASE exposed paddle length is longer than Carsem
D	Exposed pad Width	ASE exposed pad width is smaller than Carsem

The following table compares the critical dimensions of JEDEC, Carsem and ASEW, and highlights in red are the differences in the ASE-W footprint:

IR 5x6mm Option B ASE vs POD Critical Dimensions Comparison										
Description	Dimension	JEDEC MO-240C			IR 04-1084 (Option B) Carsem			ASEWH		
		MIN	NOM	MAX	MIN	NOM	MAX	MIN	NOM	MAX
Pkg Thk (Z)	A	0.900	1.050	1.200	0.800	0.830	1.050	0.950	1.000	1.050
Exces LF outside pkg perimeter (Z)	A1	0.000	N/A	0.050	0.000	0.020	0.050	0.000	N/A	0.050
LF cross section inside dimension (Z)	A3	0.230	0.280	0.330		0.254 REF			0.254	
Lead Width (X)	b	0.330	0.410	0.510	0.350	0.400	0.470	0.360	0.410	0.460
Pkg Length (X)	D		5.15 BSC		4.850	5.000	5.150		5.15 BSC	
Bottom Mold Cap Length (X)	D1	4.500	4.900	5.100	4.675	4.750	5.000		5.00 BSC	
Expose pad length (X)	D2		N/A	4.220	3.700	4.210	4.300	3.700	3.800	3.900
Pkg width (Y)	E		6.15 BSC		5.850	6.000	6.150		6.15 BSC	
Bottom Mold Cap width (Y)	E1	5.500	5.800	6.100	5.675	5.750	6.000		6.00 BSC	
Expose pad width (Y)	E2		N/A	4.300	3.380	3.570	3.760	3.560	3.660	3.760
Lead Pitch	e		1.27 BSC			1.27 BSC			1.27 BSC	
Lead Length	L	0.510	0.610	0.710	0.550	0.800	0.900	0.510	0.610	0.710
LF length attached to the pad dimension	M		0.400 REF			0.400 REF		0.510	0.610	0.710
Pkg Body Chamfer degrees	P			12		10	12	10	11	12

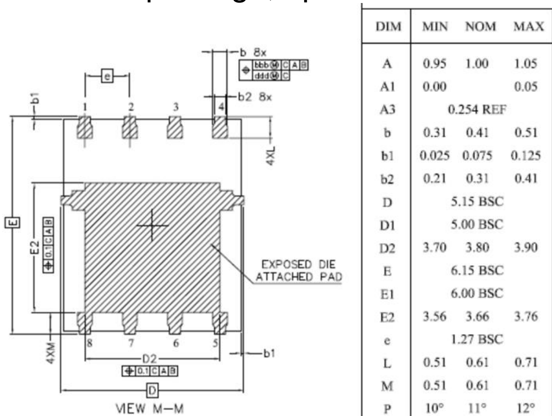
POD and footprint assessment (cont.):

Carsem site package, option “B” outline (this schematic is currently shown on all existing product datasheets):



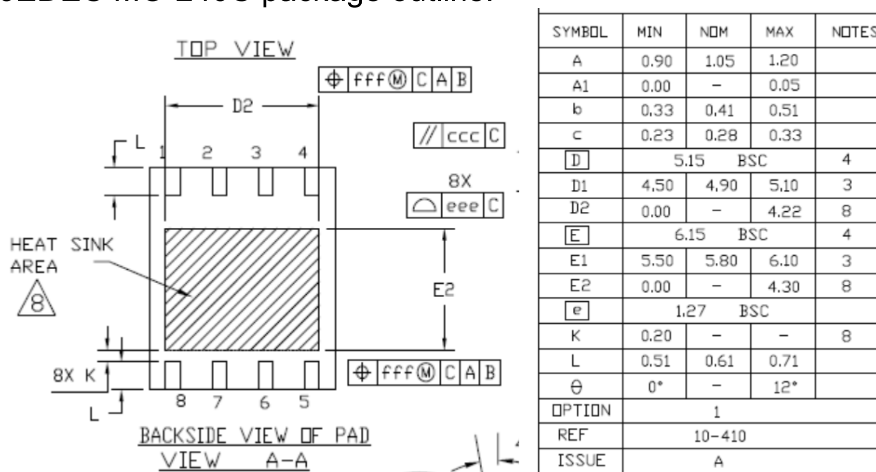
SYMBOL \ DIM	MIN	NOM	MAX
A	0.800	0.830	1.05
A1	0.000	0.020	0.050
A2	0.580	0.630	0.680
A3		0.254 REF	
Θ	0°	10°	12°
b	0.350	0.400	0.470
D	4.850	5.000	5.150
D1	4.675	4.750	5.000
D2	3.700	4.210	4.300
e		1.270 BSC	
E	5.850	6.000	6.150
E1	5.675	5.750	6.000
E2	3.380	3.480	3.760
E4	2.480	2.580	2.680
L	0.550	0.800	0.900
R		0.200 REF	
R1		0.100 REF	
R2	0.150	0.200	0.250

ASEW site package, option “G” outline:



DIM	MIN	NOM	MAX
A	0.95	1.00	1.05
A1	0.00		0.05
A3		0.254 REF	
b	0.31	0.41	0.51
b1	0.025	0.075	0.125
b2	0.21	0.31	0.41
D		5.15 BSC	
D1		5.00 BSC	
D2	3.70	3.80	3.90
E		6.15 BSC	
E1		6.00 BSC	
E2	3.56	3.66	3.76
e		1.27 BSC	
L	0.51	0.61	0.71
M	0.51	0.61	0.71
P	10°	11°	12°

JEDEC MO-240C package outline:

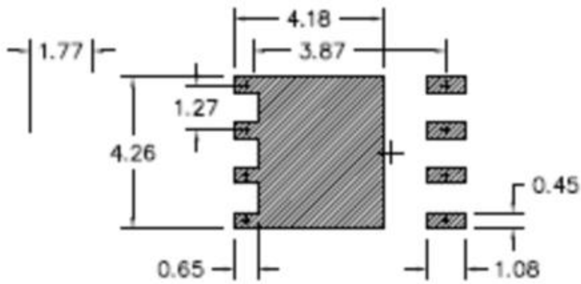


SYMBOL	MIN	NOM	MAX	NOTES
A	0.90	1.05	1.20	
A1	0.00	–	0.05	
b	0.33	0.41	0.51	
c	0.23	0.28	0.33	
D		5.15 BSC		4
D1	4.50	4.90	5.10	3
D2	0.00	–	4.22	8
E		6.15 BSC		4
E1	5.50	5.80	6.10	3
E2	0.00	–	4.30	8
e		1.27 BSC		
K	0.20	–	–	8
L	0.51	0.61	0.71	
θ	0°	–	12°	
OPTION		1		
REF		10-410		
ISSUE		A		

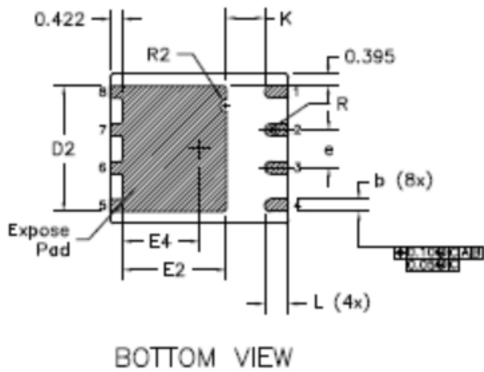
Note: Differences in critical dimensions between the three schematics are highlighted in page 1 of this document.

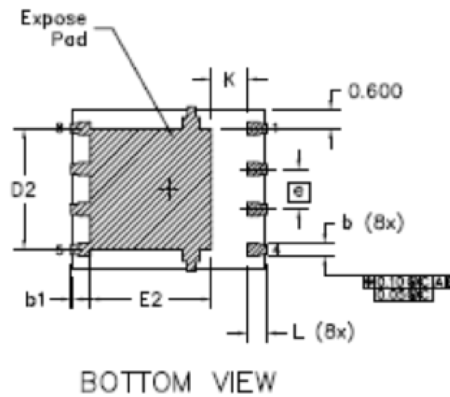
POD and footprint assessment (cont.):

Application Note AN-1136 captures the recommended Substrate/PCB layout for 5x6 PQFN products shown below:

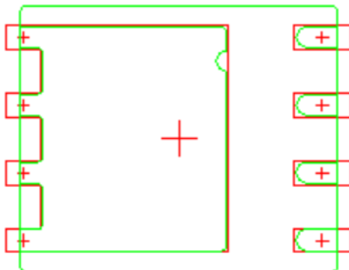


The following simulation shows the overlay of the package outline Option “B” and Option “G” onto this reccomended PCB layout:



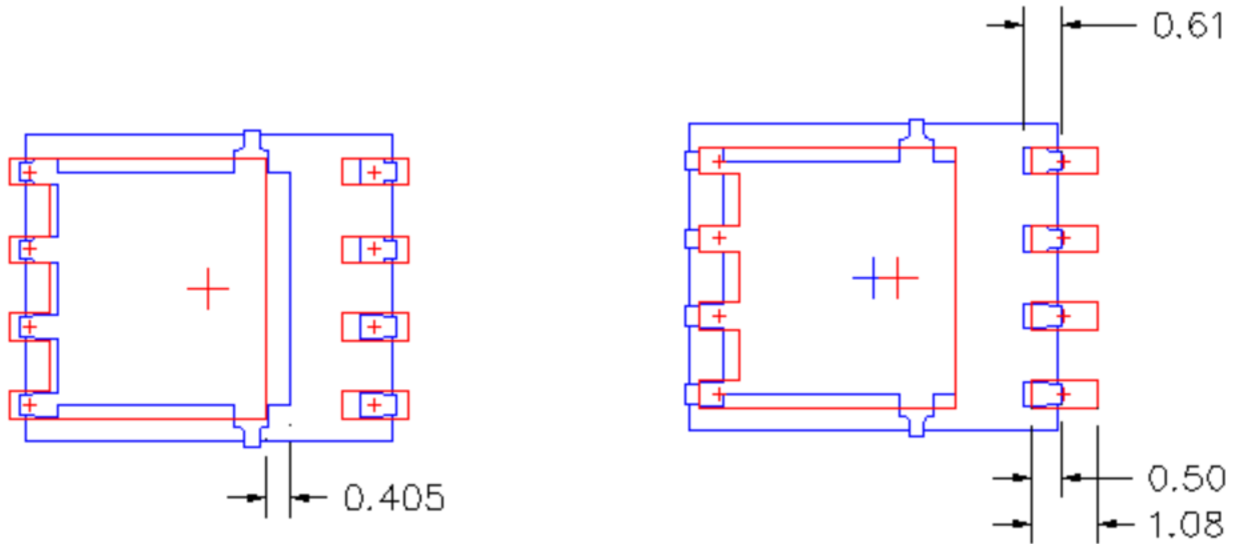


Option “B” before and after solder reflow:
-Red layer: PCB layout
-Green layer: Package outline and footprint



POD assessment (cont.):

Option “G” before solder reflow: -Red layer: PCB layout -Blue layer: Package outline and footprint. There is a typical 0.405mm off-set between drain pad edge and PCB layout.	Option “G” after solder reflow: -Red layer: PCB layout -Blue layer: Package outline and footprint. The device moves and aligns itself within the pad tolerances once the solder has melted.The adhesion forces of the solder pull the drain pad of the package to align to the drain pad in the PCB.



Conclusion is that the ASE-W product (Option G) will align differently from Carsem (Option B) with an off-set 0.405 mm center to center, but all contact areas are well withing JEDEC requirements. Both Option B and G are within JEDEC requirements, and based on our reccomended PCB footprinta are backward compatible.

This simulation is based on the Substrate/PCB layout suggested in Application Note AN-1136.

We recommend that you review your PCB layout for compatibility and respond to this PCN within 30 days and please do not hesitate for any questions. .

Contact Information:

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