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J Series SiPM Sensors

Table 3. PERFORMANCE PARAMETERS

Parameter (Note 4)	30035		40035		60035		Unit
	Overvoltage						Unit
	+2.5 V	+6 V	+2.5 V	+6 V	+2.5 V	+6 V	
PDE (Note 5)	38	50	38	50	38	50	%
Dark Count Rate	50	150	50	150	50	150	kHz/mm ²
Gain (anode-cathode)	2.9×10^6	6.3×10^6	2.9×10^6	6.3×10^6	2.9×10^6	6.3×10^6	
Dark Current typical	0.23	1.9	0.35	3.0	0.9	7.5	μA
Dark Current maximum	0.31	3.00	0.45	4.0	1.25	12.0	
Rise Time (Note 6) anode-cathode output	90	110	90	110	180	250	ps
Microcell Recharge Time Constant (Note 7)	45		48		50		ns
Capacitance (Note 8) (anode output)	1070		1800		4140		pF
Capacitance (Note 8) (fast output)	40		70		160		pF
Fast Output Pulse Width (FWHM)	1.5		1.7		3.0		ns
Crosstalk	1.5%		1.7%		3.0%		

J Series SiPM Sensors

PERFORMANCE PLOTS

Figure 1. Photon Detection Efficiency (PDE)
(MicroFJ 60035 TSV)

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Figure 4. Gain vs. Overvoltage
(MicroFJ 30035 TSV)

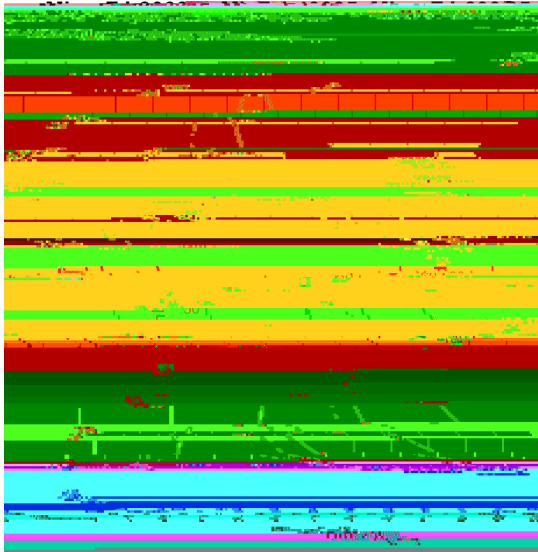


Figure 5. Fast Output Pulse Shape
(MicroFJ 30035, MicroFJ 40035, MicroFJ 60035
V_{br} + 2.5 V, 10 Ω Sense Resistor)

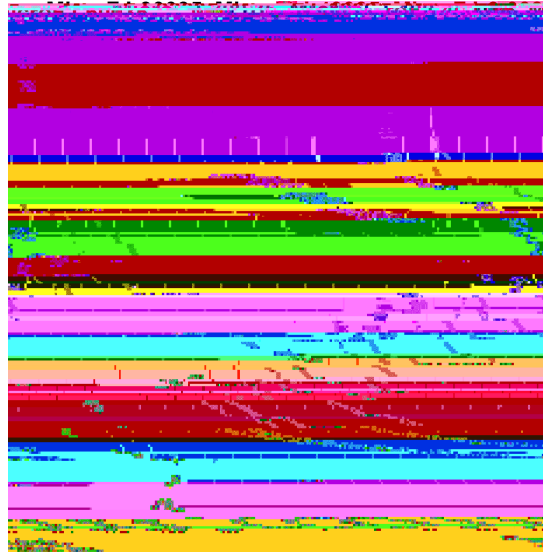


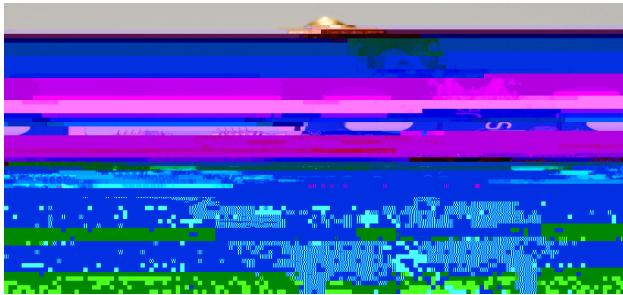
Figure 6. Standard Output Pulse Shape
(MicroFJ 30035, MicroFJ 40035, MicroFJ 60035
V_{br} + 2.5 V, 10 Ω Sense Resistor)

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EVALUATION BOARD OPTIONS

SMA BIASING BOARD (MicroFJ SMA XXXXX)

Ω



MicroFJ SMA XXXXX	
Output	Function
Vbias	Positive bias input (cathode)
Fout	Fast output
Sout	Standard output (anode)

PIN ADAPTER (MicroFJ SMTPA XXXXX)

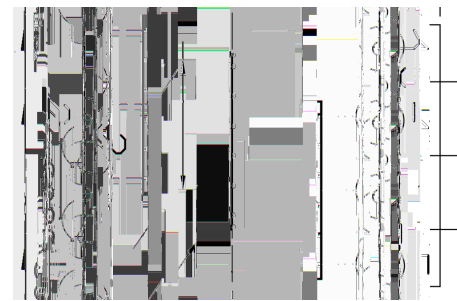


Figure 7. Top View of the SMTPA Board Showing the Pin Numbering

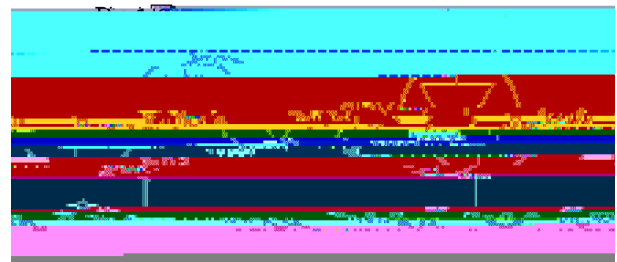


Figure 8. SMTPA Circuit Schematic

MicroFJ SMTPA XXXXX	
Pin No.	Connection
1	Anode
2	Fast output
3	Cathode

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CIRCUIT SCHEMATICS

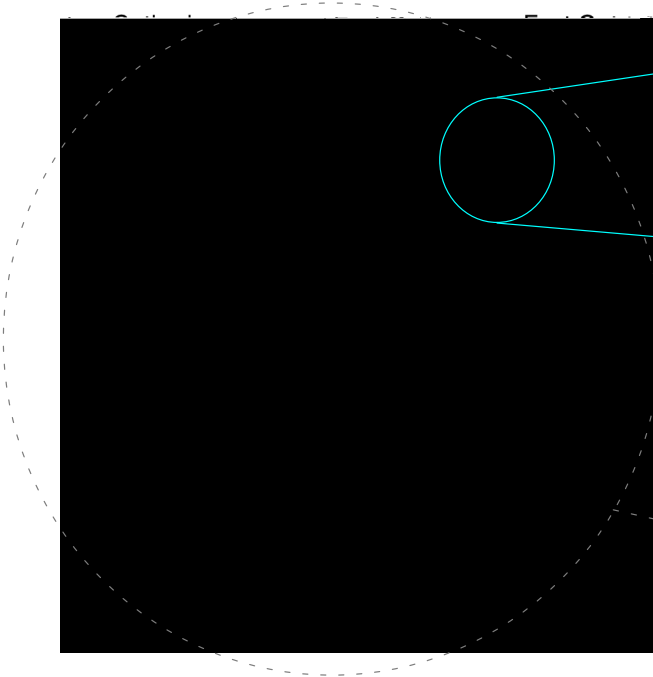


Figure 10. Simplified Circuit Schematic of the onsemi SiPM showing only a 12 Microcell Example. Typically, SiPM Sensors have Hundreds or Thousands of Microcells

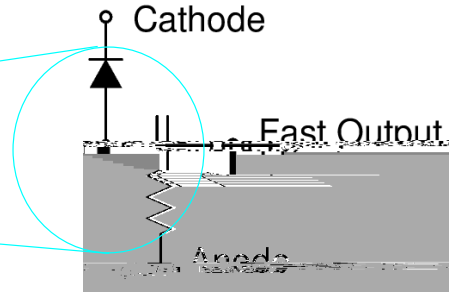


Figure 9. Circuit Schematic of the onsemi SiPM Microcell, showing Details of the Fast Output



Figure 11. onsemi SiPM Component Symbol

TILING OF THE TSV PACKAGE

onsemi

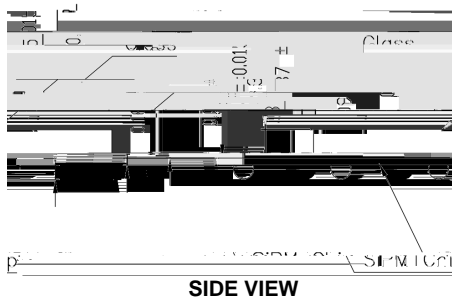
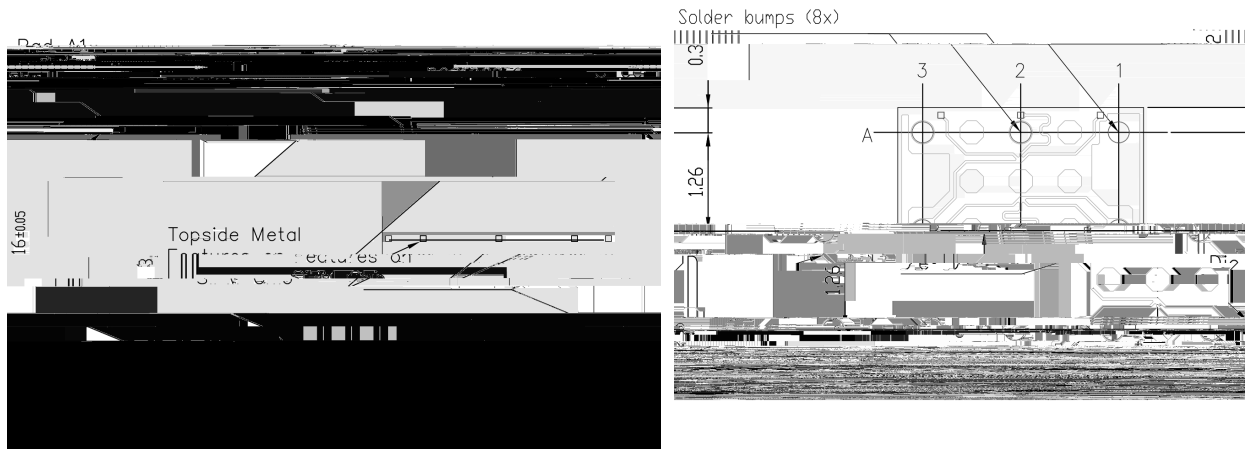
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PACKAGE DIMENSIONS

(All Dimensions in mm)

MicroFJ 300XX TSV

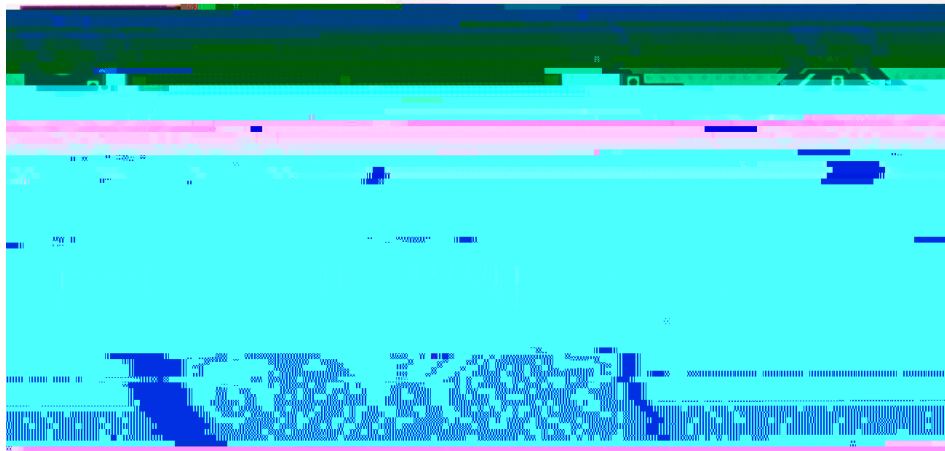


SIDE VIEW

BOTTOM VIEW

Pin Assignments	
Pin Number	MicroFJ 300XX TSV
B1	Anode
B3	Fast output
A1, C3	Cathode
All others	No Connect*

*The 'No Connect' pins are electrically isolated and should be soldered to a ground (or bias) plane to help with heat dissipation.

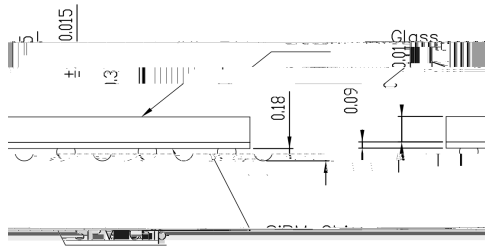
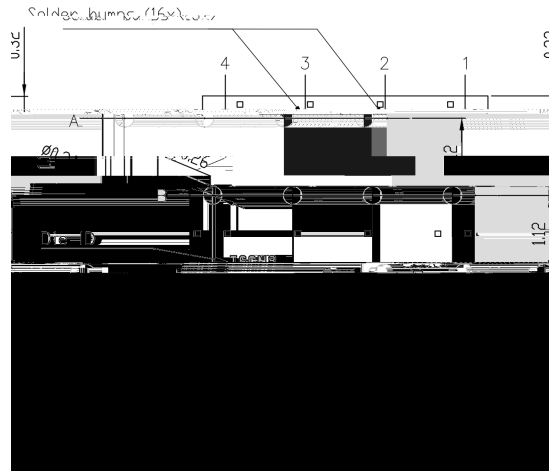


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PACKAGE DIMENSIONS

(All Dimensions in mm)

MicroFJ 40035 TSV



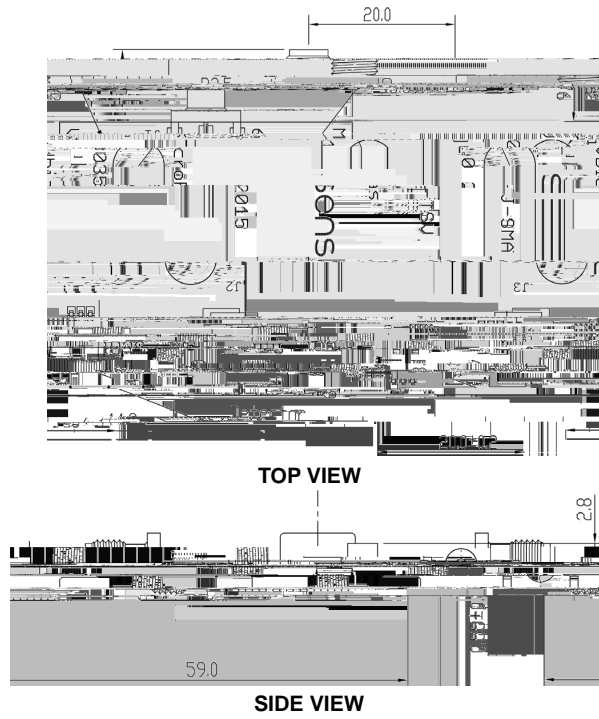
B1, C1	Anode
B4, C4	Fast output
A1, D4	Cathode

*The 'No Connect' pins are electrically isolated and should be soldered to a ground (or bias) plane to help with heat dissipation.

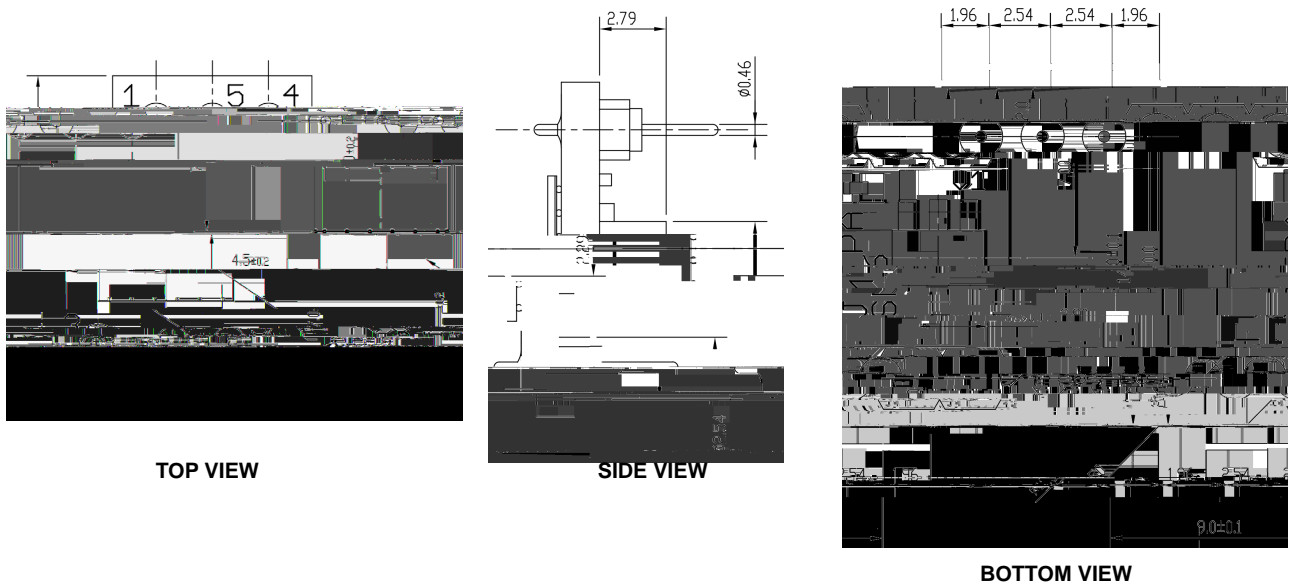
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MicroFJ SMA 60035 Board



MicroFJ SMTPA 60035 Board



J Series SiPM Sensors

ORDERING INFORMATION

Table 5. ORDERING INFORMATION

Product Code	Microcell Size (No. of Microcells)	Sensor Active Area
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