

## Supporting Information

### **Fine Regulation of Crystallisation Tendency to Optimize the BHJ Nanostructure and Performance of Polymer Solar Cell**

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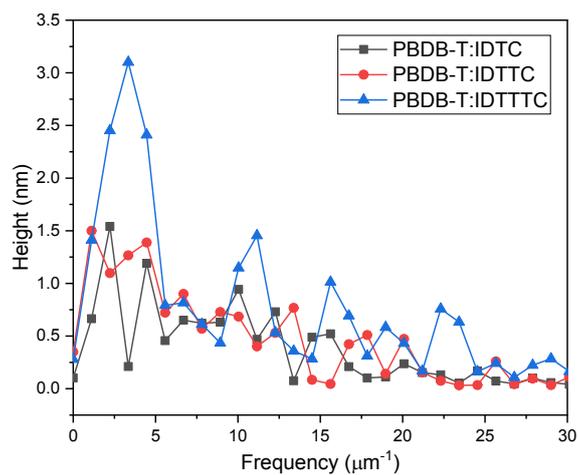
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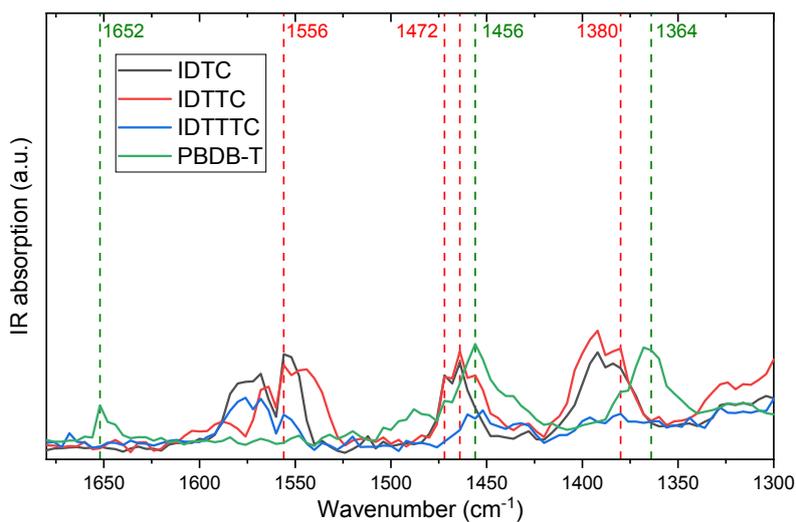
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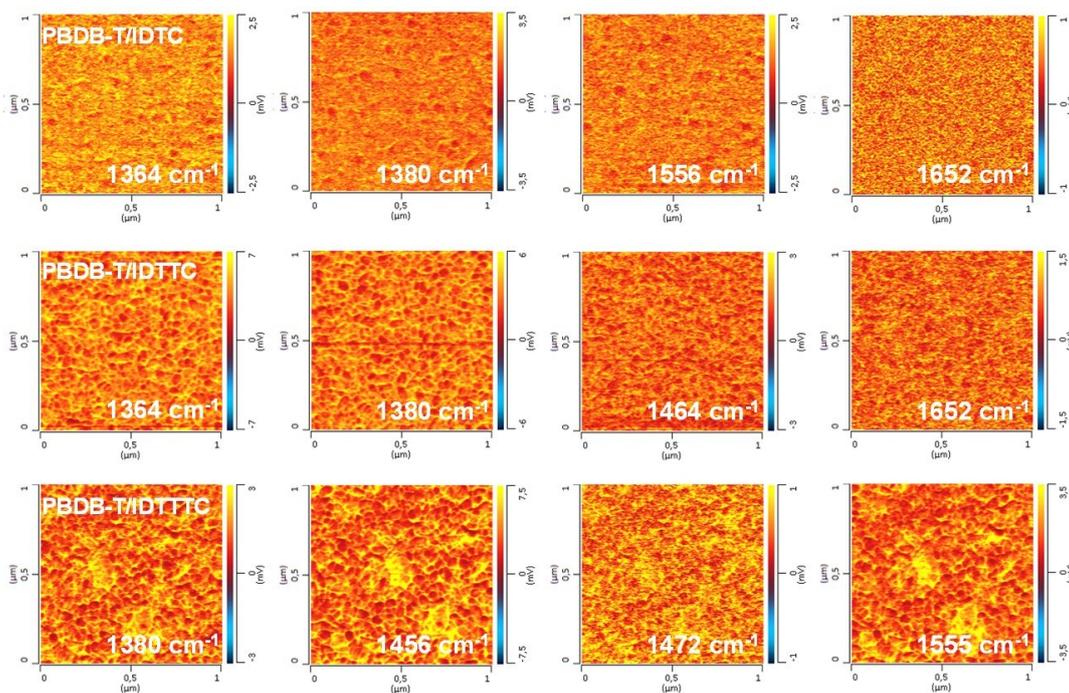
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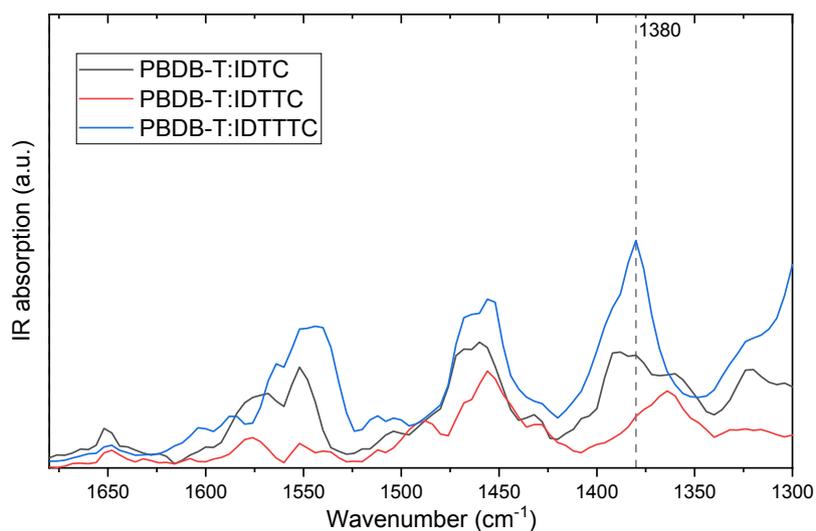
**Fig. S1** Fourier transform of surface profile of AFM images in Figure 5.



**Fig. S2** IR response measured from the AFM-IR for neat thin films with highlighted wavenumbers were either the donor or the acceptor has higher response.



**Fig. S3** AFM-IR images for blend thin film measured as various wavenumbers. All images were found with the rice like grains showing relatively lower IR response. We attributed this observation to the relatively low IR response of PBDB-T in blend films and the acceptor molecules dissolving in the polymer rich phase. Wave number of  $1380\text{ cm}^{-1}$  was selected to highlight the acceptors for their high contrast.



**Fig. S4** IR response measured from the AFM-IR for blend thin films showing high IR response for all three films at  $1380\text{ cm}^{-1}$ .

**Table S1** Summarized parameters of 10 random grains from the AFM image of PBDB-T:IDTC.

Entry	Width (nm)	Length (nm)	L/W
1	52.4	68.6	1.3
2	28.7	61.1	2.1
3	46.1	86	1.9
4	39.9	72.3	1.8
5	29.9	66.1	2.2
6	42.4	73.6	1.7
7	41.1	72.3	1.8
8	41.1	82.3	2.0
9	32.4	59.9	1.8
10	37.4	51.1	1.4
Average	39.14	69.33	1.8

**Table S2** Summarized parameters of 10 random grains from the AFM image of PBDB-T:IDTTC.

Entry	Width (nm)	Length (nm)	L/W
1	42.1	62.3	1.5
2	25.6	75.1	2.9
3	31.1	69.6	2.2
4	22.0	76.9	3.5
5	33.0	64.1	1.9
6	36.6	67.8	1.9
7	33.0	56.8	1.7
8	40.3	78.8	2.0
9	23.8	62.3	2.6
10	29.3	62.3	2.1
Average	31.68	67.6	2.2

**Table S3** Summarized parameters of 10 random grains from the AFM image of PBDB-T:IDTTTC.

Entry	Width (nm)	Length (nm)	L/W
1	34.4	74.6	2.2
2	40.5	66.5	1.6
3	30.8	66.5	2.2
4	37.3	85.9	2.3
5	43.8	74.6	1.7
6	34.0	55.1	1.6
7	30.8	63.2	2.1
8	40.5	71.3	1.8
9	55.1	74.6	1.4
10	43.8	68.1	1.6
Average	39.1	70.04	1.8