Supporting Information

Functional Fluoropolymers with Good Low-dielectric Properties and High Thermostability

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This supplemental document contains 9 figures and 3 tables over 8 pages.

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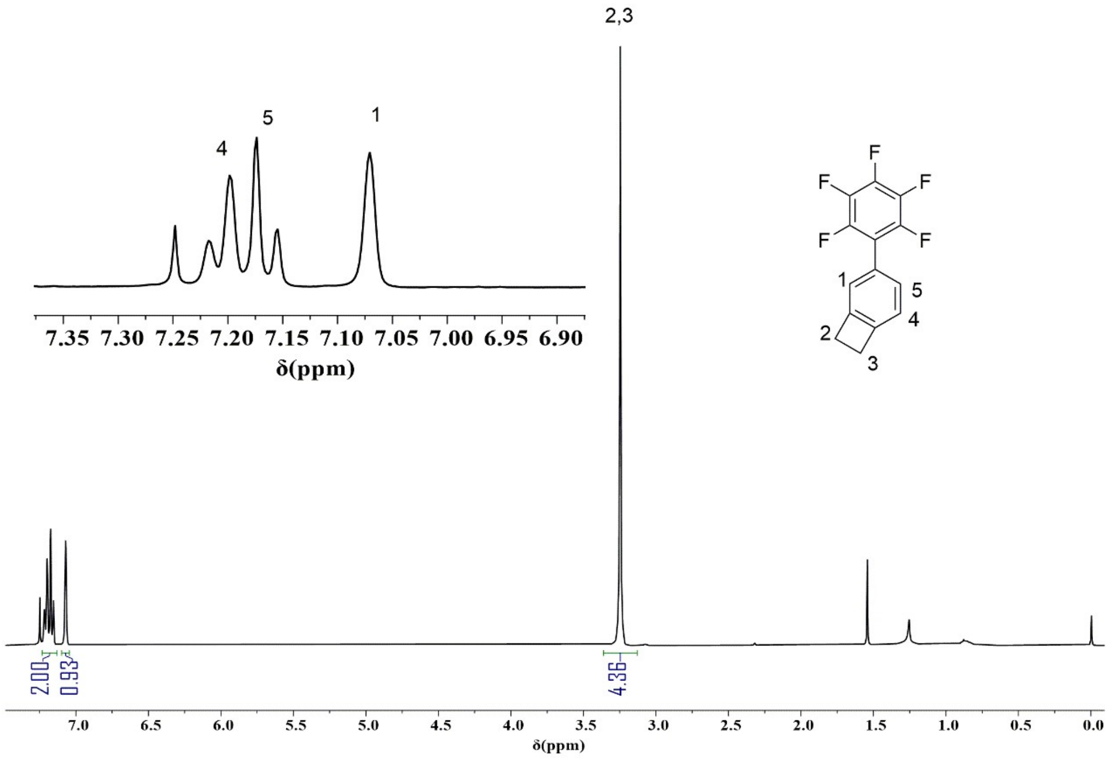


Figure S1. ^{1}H NMR spectrum of **FBCB** (500 MHz, $CDCl_3$)

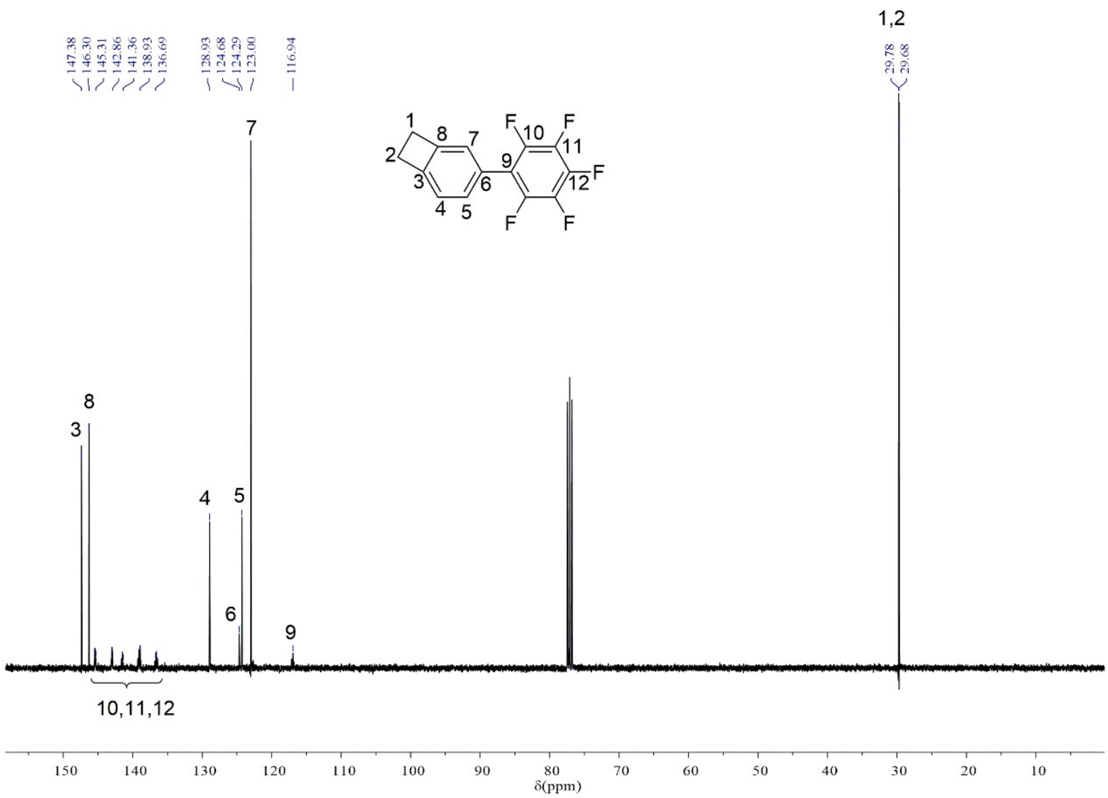


Figure S2. ^{13}C NMR spectrum of **FBCB** (126 MHz, $CDCl_3$)

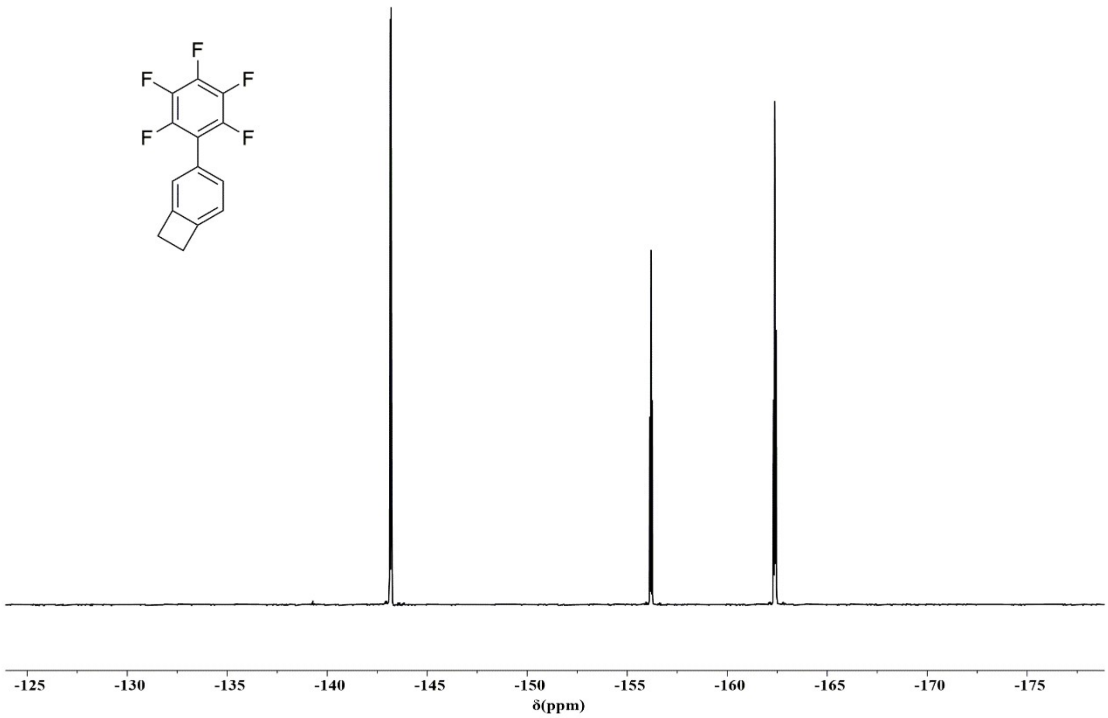


Figure S3. ^{19}F NMR spectrum of **FBCB** (376 MHz, $CDCl_3$)

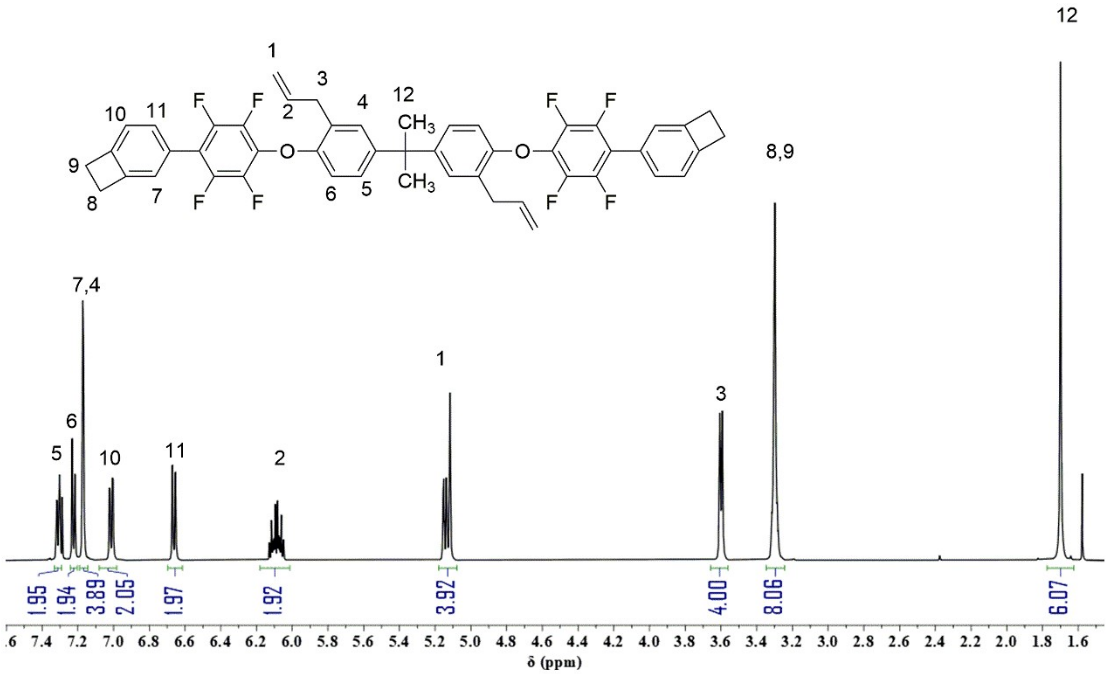


Figure S4. ^{1}H NMR spectrum of **DBA-FBCB** (500 MHz, $CDCl_3$)

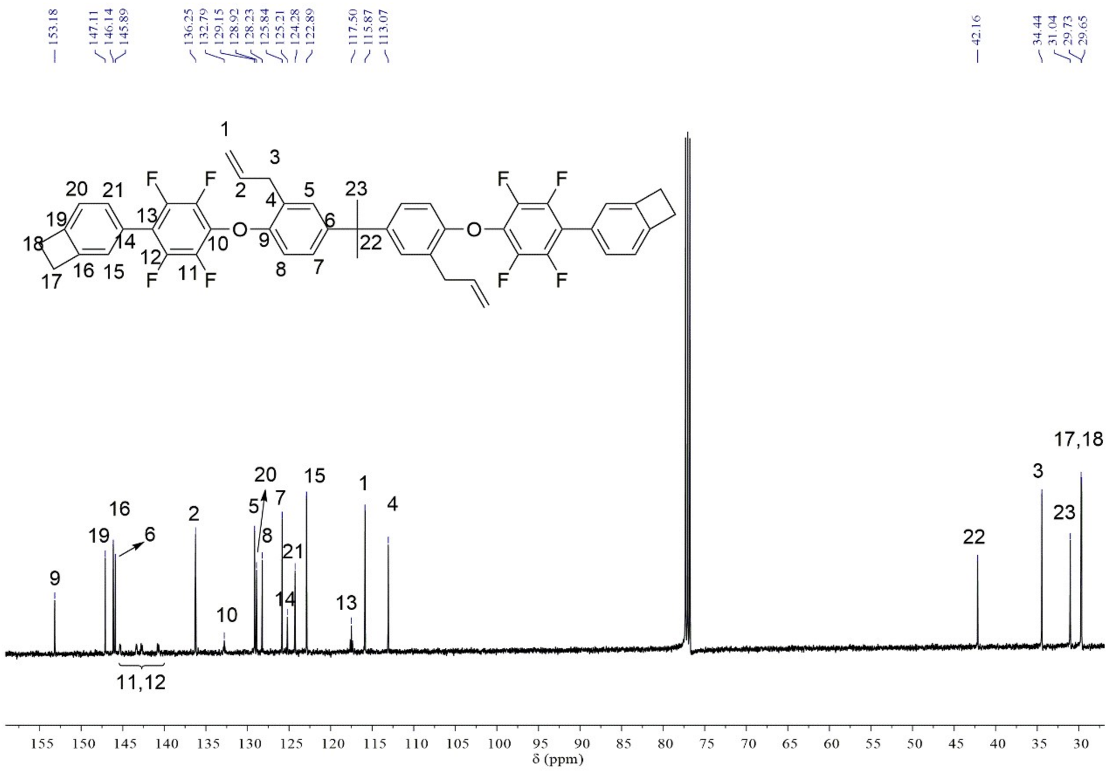


Figure S5. ^{13}C NMR spectrum of **DBA-FBCB** (126 MHz, $CDCl_3$)

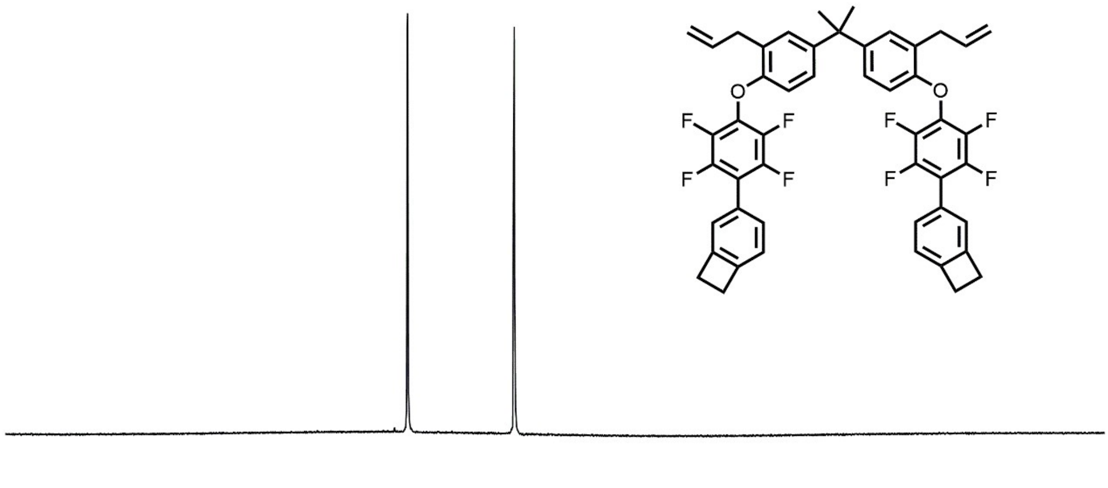


Figure S6. ^{19}F NMR spectrum of **DBA-FBCB** (376 MHz, $CDCl_3$)

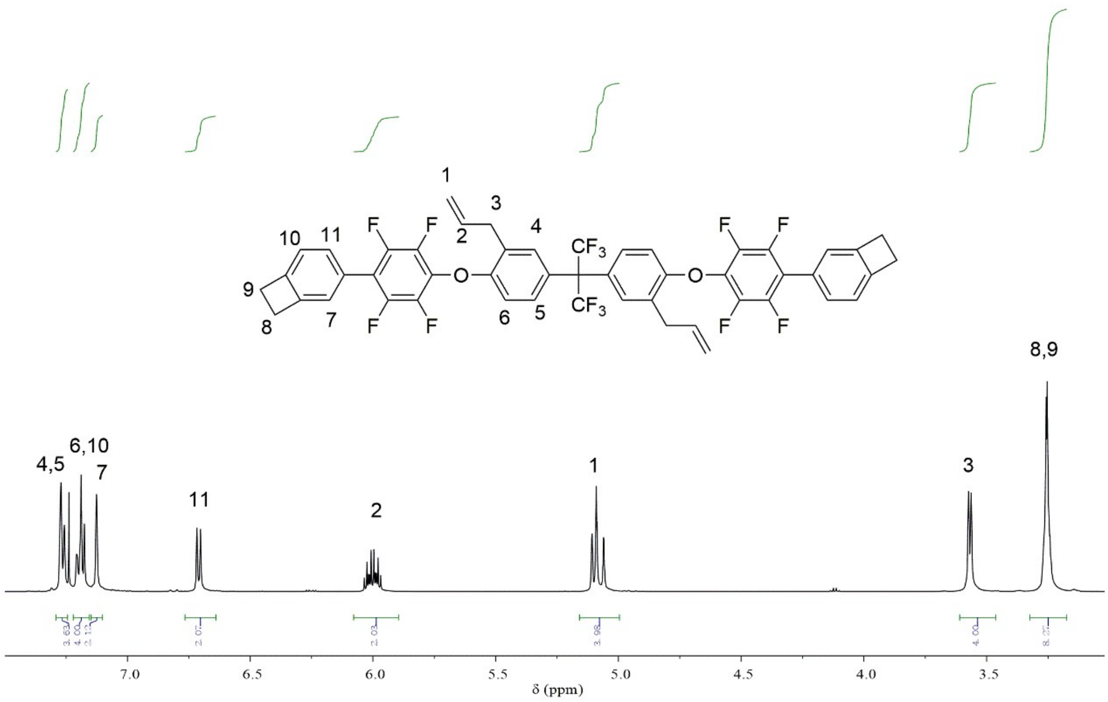


Figure S7. [1]H NMR spectrum of **DBAF-FBCB** (500 MHz, $CDCl_3$)

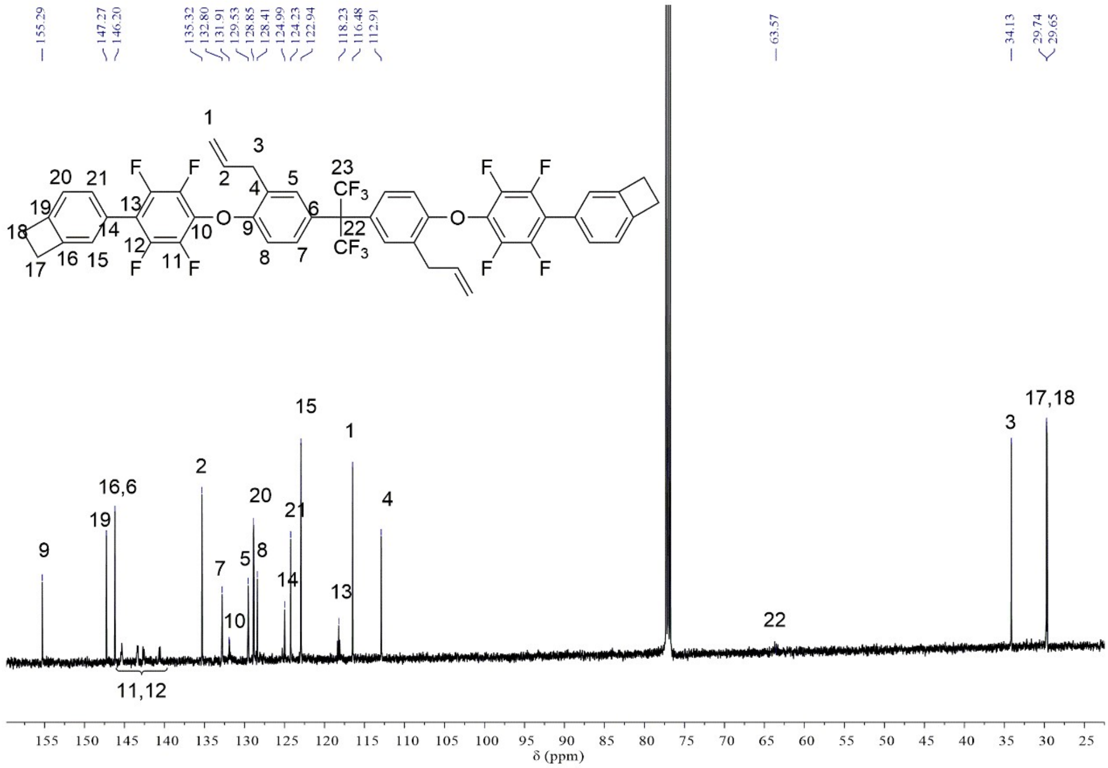


Figure S8. [13]C NMR spectrum of **DBAF-FBCB** (126 MHz, $CDCl_3$)

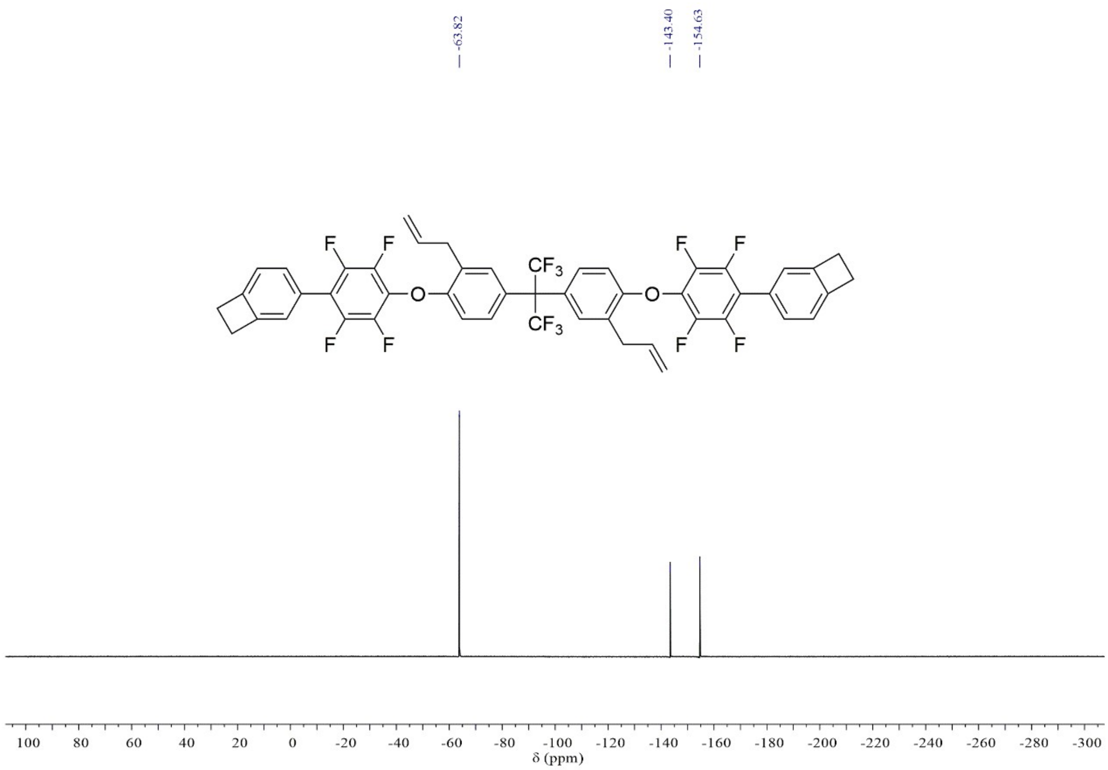


Figure S9. [19]F NMR spectrum of **DBAF-FBCB** (376 MHz, $CDCl_3$)

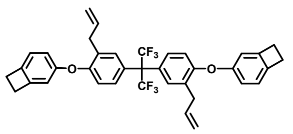
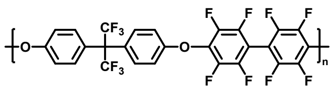
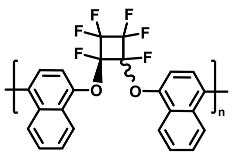
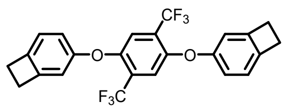
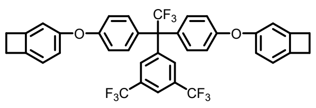
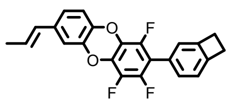
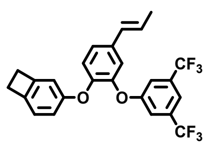
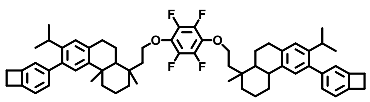
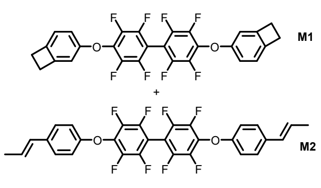
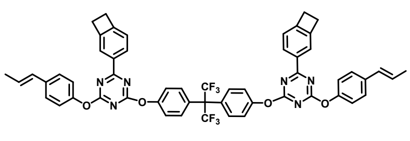
Table S1. The amounts of reactants used in the synthesis of **TMS-DBA** and **TMS-DBFA**

Product	DBA		DBAF		TBSCl		Imidazole		Yield
	Mass (g)	Molar ratio	Mass (g)	Molar ratio	Mass (g)	Molar ratio	Mass (g)	Molar ratio	(%)
TMS-DBA	10.0	1 eq.	-	-	10.75	2.2 eq.	4.86	2.2 eq.	86
TMS-DBFA	-	-	8.3	1 eq.	6.6	2.2 eq.	3.0	2.2 eq.	86

Table S2. The amounts of reactants used in the synthesis of **DBA-FBCB** and **DBA-FBCB**

Product	TMS-DBA		TMS-DBAF		FBCB		K_2CO_3		Yield
	Mass (g)	Molar ratio	Mass (g)	Molar ratio	Mass (g)	Molar ratio	Mass (g)	Molar ratio	(%)
DBA-FBCB	3.7	1 eq.	-	-	3.91	2.1 eq.	0.095	0.0001 eq.	72
DBFA-FBCB	-	-	6.1	1 eq.	5.4	2.1 eq.	0.131	0.0001 eq.	55

Table S3. Properties of fluorinated resins and polymers

Entry	sample	T_g (^{o}C)	T_{5d} (^{o}C)	D_k	tan δ	Frequency	References
1		341	439	2.56	1.2×10^{-3}	5 GHz	[1]
2		172	495	2.59	5.4×10^{-4}	1 KHz	[2]
3		235	437	< 2.50	$< 1.2\times10^{-3}$	5~30 MHz	[3]
4		-	429	< 2.51	3×10^{-3}	0.15~30 MHz	[4]
5	 BOPP9FE	232	433	2.58	2.7×10^{-4}	1 MHz	[5]
6		334	483	2.60	1.4×10^{-3}	10 GHz	[6]
7		132	473	2.56	1.2×10^{-3}	5 GHz	[7]
8		254	405	2.44	2.3×10^{-3}	15 MHz	[8]
9	 M1:M2=1:1	189	460	2.50	1.4×10^{-3}	5 GHz	[9]
10		300	430	2.76	$< 2.5\times10^{-3}$	0.1~30 MHz	[10]
11	p-DBA-FBCB	371	432	2.64 2.63	4.8×10^{-3} 2.04×10^{-3}	1-10 MHz 5 GHz	This work
12	p-DBAF-FBCB	374	440	2.45 2.51	1.5×10^{-3} 2.41×10^{-3}	1-10 MHz 5 GHz	This work

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