

# eGaN® FETs and ICs for Wireless Charging



## Wireless Charging Standards

### AirFuel™ Alliance Standard

### Wireless Power Application

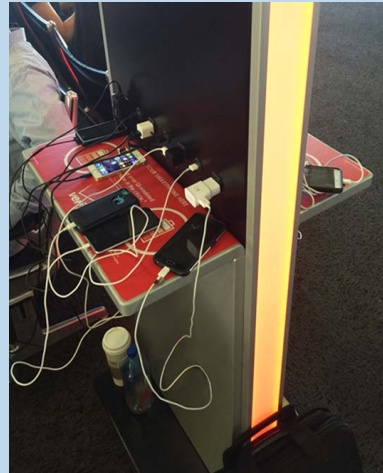


AirFuel resonant wireless charging employs the principle of magnetic resonance, bringing a number of unique benefits to wireless power applications such as:

- **Consumer Electronics**
- **Automotive**
- **Medical**



### Cut the Cord!



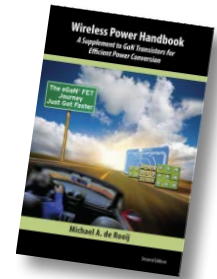
- Eliminates the need for cumbersome power cords
- No need to find power outlets

### Benefits

eGaN FETs and ICs make ideal switching devices for use in wireless power, ensuring low operating losses, which lead to higher amplifier efficiency and help keep EMI generation low.

In addition, eGaN FETs and ICs have a very small footprint and are low profile, which are important for smartphone handsets.

eGaN FETs and ICs high frequency switching (6.78 MHz) and the FET's extremely small chip-scale packaging enables high power density with outstanding thermal efficiency.



## Wireless Charging Evaluation Kits using eGaN FETs and ICs



- Class 2: 10 W (EPC9127)
- Class 3: 16 W (EPC9128)
- Class 4: 30 W (EPC9128)
- 6.78 MHz : 33 W (EPC9129)
- 6.78 MHz : 50 W (EPC9112)

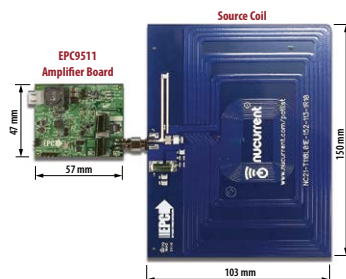
Reduce wireless power system cost by leveraging the ability to power multiple devices from a single-stage transmitter.

eGaN FETs and ICs are available to enable the full AirFuel Alliance power range. Dedicated eGaN FETs and ICs for each power requirement:

- Class 2: [EPC2107/EPC2036](#)
- Class 3: [EPC2108/EPC2036](#)
- Class 4: [EPC8010/EPC2038/EPC2019](#)
- 33 W: [EPC2014C](#)
- 50 W: [EPC2007C/EPC2038](#)



## Multi-mode Evaluation Kit



EPC9121: 10 W Multi-mode wireless power charging eGaN FET and IC Evaluation Kit

Multi-mode wireless power capability eliminates the need for the user to worry about the wireless power standard of the receiving device.

eGaN FETs and ICs enable high efficiency for both low and high frequency modes.

- AirFuel compatible – class 2
- Wireless Power Consortium (Qi) compatible – A6

**Highly Resonant  
Wireless Power Kits**

Part Number	Output Power	Operating Frequency
EPC9111	35 W	6.78 MHz present or user selectable
EPC9112	50 W	6.78 MHz present or user selectable

**AirFuel™ Alliance Compatible  
Wireless Power Kits**

Part Number	Class	Output Power	Operating Frequency
EPC9127	2	10 W	6.78 MHz
EPC9128	3	16 W	6.78 MHz
EPC9129	4	33 W	6.78 MHz

**Multi-Mode  
Wireless Power Kit**

Part Number	Standard	Class	Output Power	Operating Frequency
EPC9121	AirFuel Compatible Qi/PMA Compatible	2 A6	10 W 5 W	6.78 MHz 6.165 KHz

**Wireless Power Amplifier Boards**

Part Number	Description	V <sub>IN</sub>	V <sub>OUT</sub>	I <sub>OUT</sub> (A)	Featured Product
EPC9051	Class-E	0 V - 40 V	V <sub>IN</sub>	1 A	EPC2037
EPC9052	Class-E	0 V - 40 V	V <sub>IN</sub>	1 A	EPC2012C
EPC9053	Class-E	0 V - 40 V	V <sub>IN</sub>	1 A	EPC2019
EPC9054	Class-E	0 V - 40 V	V <sub>IN</sub>	1 A	EPC2010C
EPC9083	Class-E	0 V - 80 V	V <sub>IN</sub>	4 A	EPC2046
EPC9508	ZVS Class-D	7 V - 36 V	V <sub>IN</sub>	3 A	EPC8009, EPC2007C
EPC9506	ZVS Class-D	8 V - 32 V	V <sub>IN</sub>	10 A	EPC2014C
EPC9507	ZVS Class-D	8 V - 36 V	V <sub>IN</sub>	6 A	EPC2007C, EPC2038
EPC9509	ZVS Class-D	17 V - 24 V	52 V	1 A	EPC2108, EPC2036
EPC9510	ZVS Class-D	17 V - 24 V	66 V	0.8 A	EPC2107, EPC2036
EPC9065	ZVS Class-D	12 V (max V <sub>DD</sub> )	80 V	1.8 ARMS	EPC2007C, EPC2038
EPC9512	ZVS Class-D	Mode Dependent	80 V	1.8 A	EPC8010, EPC2038, EPC2019
EPC9511	10 W Multi-Mode Wireless Power System	17 V - 24 V	66 V/ 26 V	1.7 A	EPC2107, EPC2038, EPC2036

**GaN Integrated Circuits**

Part Number	V <sub>DS</sub>	R <sub>DS(on)</sub> (typ)			Q <sub>oss</sub> (typ)		
		Q1 Control FET	Q2 Sync. FET	Bootstrap FET	Q1 Control FET	Q2 Sync. FET	Bootstrap FET
EPC2108	60	150 mΩ	150 mΩ	2.1 mΩ	650 pC	1000 pC	100 pC
EPC2107	100	240 mΩ	240 mΩ	2.1 mΩ	800 pC	1400 pC	140 pC

**Design Support Materials @ [www.epc-co.com](http://www.epc-co.com)**

- Wireless Power Handbook – Second Edition
- EPC9121 – Award Winning 10 W Multi-Mode Wireless Power Kit
- Application Brief – eGaN FETs and ICs for Wireless Power

Note: Table data subject to change. Please refer to the Product section on [www.epc-co.com](http://www.epc-co.com).

**Recommended Devices for Wireless Power**

Part Number	Configuration	V <sub>DS</sub>	Max R <sub>DS(on)</sub> (mΩ) (V <sub>GS</sub> = 5 V <sub>GS</sub> )	Q <sub>G</sub> typ (nC)	Q <sub>GS</sub> typ (nC)	Q <sub>GD</sub> typ (nC)	Q <sub>SS</sub> typ (nC)	Max. Peak Pulsed I <sub>B</sub> (A) (25°C, T <sub>pulse</sub> = 300 μs)	Package (mm)	Development Board
EPC8004	Single	40	110	0.37	0.12	0.047	0.63	27	LGA 6.05 x 2.3	EPC9033
EPC2014C	Single	40	16	2	0.7	0.3	4	60	LGA 1.7 x 1.1	EPC9005C
EPC2015C	Single	40	4	8.7	2.7	1.2	19	235	LGA 4.1 x 1.6	EPC9001C
EPC2108	Dual with Sync Boot	60	240 3300	0.24 0.044	0.106 0.02	0.047 0.004	0.71 0.93 0.134	5.5 0.5	BGA 1.35 x 1.35	EPC9064
EPC8009	Single	65	130	0.37	0.12	0.055	0.94	7.5	LGA 2.05 x 0.85	EPC9029
EPC2039	Single	80	25	1.91	0.76	0.42	7.64	50	BGA 1.35 x 1.35	EPC9057
EPC2038	Single with Gate Diode	100	3300	0.044	0.02	0.004	0.134	0.5	BGA 0.9 x 0.9	EPC9057
EPC2107	Dual with Sync Boot	100	390 3300	0.19 0.044	0.077 0.02	0.041 0.004	1.25 0.9 0.134	3.8 0.5	BGA 1.35 x 1.35	EPC9063
EPC8010	Single	100	160	0.36	0.13	0.06	2.2	7.5	LGA 2.05 x 0.85	EPC9030
EPC2036	Single	100	73	0.7	0.17	0.14	3.9	18	BGA 0.9 x 0.9	EPC9050
EPC2007C	Single	100	30	1.6	0.6	0.3	8.3	40	LGA 1.7 x 1.1	EPC9006C
EPC2016C	Single	100	16	3.4	1.1	0.55	16	75	LGA 2.1 x 1.6	EPC9010C
EPC2110	Dual Common Source	120	60	0.8	0.25	0.19	4.9	20	BGA 1.35 x 1.35	N/A
EPC2012C	Single	200	100	1	0.3	0.2	10	22	LGA 1.7 x 0.9	EPC9004C
EPC2019	Single	200	50	1.8	0.6	0.35	18	42	LGA 2.77 x 0.95	EPC9014
EPC2010C	Single	200	25	3.7	1.3	0.7	40	90	LGA 3.6 x 1.6	EPC9003C
EPC2046	Single	200	25	2.9	1	0.6	22	55	BGA 2.77 x 0.95	EPC9079
EPC2047	Single	200	10	8.2	2.9	1.8	60	160	LGA 4.6 x 1.6	EPC9081



**For More Information**  
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 or your local sales representative  
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