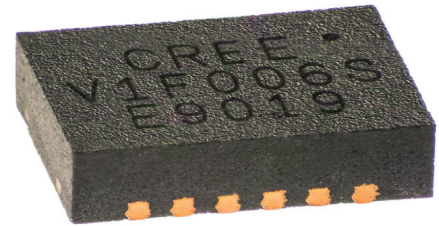


# CGHV1F006S

6 W, DC - 15 GHz, 40 V, GaN HEMT

## Description

Cree's CGHV1F006S is an unmatched, gallium nitride (GaN) high electron mobility transistor (HEMT) designed specifically for high efficiency, high gain and wide bandwidth capabilities. The device can be deployed for L, S, C, X and Ku-Band amplifier applications. The datasheet specifications are based on a C-Band (5.5 - 6.5 GHz) amplifier. Additional application circuits are available for C-Band at 5.8 GHz - 7.2 GHz and X-Band at 7.9 - 8.4 GHz and 8.5 - 9.6 GHz. The CGHV1F006S operates on a 40 volt rail circuit while housed in a 3mm x 4mm, surface mount, dual-flat-no-lead (DFN) package. Under reduced power, the transistor can operate below 40V to as low as 20V  $V_{DD}$ , maintaining high gain and efficiency.



Package Type: 3x4 DFN  
PN: CGHV1F006S

## Typical Performance Over 5.5 - 6.5 GHz ( $T_c = 25^\circ\text{C}$ ), 40 V

Parameter	5.5 GHz	6.0 GHz	6.5 GHz	Units
Small Signal Gain	15.4	16.5	17.8	dB
Output Power @ $P_{IN} = 28\text{ dBm}$	38.6	39.3	39.0	dBm
Drain Efficiency @ $P_{IN} = 28\text{ dBm}$	55	57	52	%

Note: Measured in the CGHV1F006S-AMP application circuit. Pulsed 100  $\mu\text{s}$  10% duty

### Features for 40 V in CGHV1F006S-AMP

- Up to 15 GHz Operation
- 8 W Typical Output Power
- 17 dB Gain at 6.0 GHz
- 15 dB Gain at 9.0 GHz
- Application circuits for 5.8 - 7.2 GHz, 7.9 - 8.4 GHz, and 8.5 - 9.6 GHz.
- High degree of APD and DPD correction can be applied

## Listing of Available Hardware Application Circuits / Demonstration Circuits

Application Circuit	Operating Frequency	Amplifier Class	Operating Voltage
CGHV1F006S-AMP1	5.85 - 7.2 GHz	Class A/B	40 V
CGHV1F006S-AMP2	7.9 - 8.4 GHz	Class A/B	40 V
CGHV1F006S-AMP3	8.5 - 9.6 GHz	Class A/B	40 V
CGHV1F006S-AMP4	4.9 - 5.9 GHz	Class A/B	20 V

 Large Signal Models Available for ADS and MWO

**RoHS**  
COMPLIANT

**Absolute Maximum Ratings (not simultaneous) at 25 °C Case Temperature**

Parameter	Symbol	Rating	Units	Notes
Drain-Source Voltage	$V_{DSS}$	120	Volts	25 °C
Gate-to-Source Voltage	$V_{GS}$	-10, +2	Volts	25 °C
Storage Temperature	$T_{STG}$	-65, +150	°C	
Operating Junction Temperature	$T_J$	225	°C	
Maximum Forward Gate Current	$I_{GMAX}$	1.2	mA	25 °C
Maximum Drain Current <sup>1</sup>	$I_{DMAX}$	0.95	A	25 °C
Soldering Temperature <sup>2</sup>	$T_S$	245	°C	
Case Operating Temperature <sup>3,4</sup>	$T_C$	-40, +150	°C	
Thermal Resistance, Junction to Case <sup>5</sup>	$R_{\theta JC}$	14.5	°C/W	85 °C

## Notes:

<sup>1</sup> Current limit for long term, reliable operation<sup>2</sup> Refer to the Application Note on soldering at [wolfspeed.com/rf/document-library](http://wolfspeed.com/rf/document-library)<sup>3</sup> Simulated at  $P_{DISS} = 2.4$  W<sup>4</sup>  $T_C$  = Case temperature for the device. It refers to the temperature at the ground tab underneath the package. The PCB will add additional thermal resistance<sup>5</sup> The  $R_{\theta TH}$  for Cree's application circuit, CGHV1F006S-AMP, with 31 (Ø11 mil) via holes designed on a 20 mil thick Rogers 5880 PCB, is 3.9°C/W. The total  $R_{\theta TH}$  from the heat sink to the junction is 14.5°C/W + 3.9°C/W = 18.4°C/W**Electrical Characteristics ( $T_C = 25$  °C), 40 V Typical**

Characteristics	Symbol	Min.	Typ.	Max.	Units	Conditions
<b>DC Characteristics<sup>1</sup></b>						
Gate Threshold Voltage	$V_{GS(th)}$	-3.6	-3.0	-2.4	$V_{DC}$	$V_{DS} = 10$ V, $I_D = 1.2$ mA
Gate Quiescent Voltage	$V_{GS(Q)}$	-	-2.7	-	$V_{DC}$	$V_{DS} = 40$ V, $I_D = 60$ mA
Saturated Drain Current <sup>2</sup>	$I_{DS}$	0.86	1.2	-	A	$V_{DS} = 6.0$ V, $V_{GS} = 2.0$ V
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	100	-	-	$V_{DC}$	$V_{GS} = -8$ V, $I_D = 1.2$ mA
<b>RF Characteristics<sup>3</sup> (<math>T_C = 25</math> °C, <math>F_0 = 5.925</math> GHz unless otherwise noted)</b>						
Small Signal Gain <sup>3,4</sup>	G	15.15	17.4	-	dB	$V_{DD} = 40$ V, $I_{DQ} = 60$ mA, $P_{IN} = 10$ dBm
Output Power <sup>3,4</sup>	$P_{OUT}$	37.5	38.7	-	dBm	$V_{DD} = 40$ V, $I_{DQ} = 60$ mA, $P_{IN} = 25.5$ dBm
Drain Efficiency <sup>3,4</sup>	$\eta$	35	52	-	%	$V_{DD} = 40$ V, $I_{DQ} = 60$ mA, $P_{IN} = 25.5$ dBm
Output Mismatch Stress <sup>4</sup>	VSWR	-	10 : 1	-	$\Psi$	No damage at all phase angles, $V_{DD} = 40$ V, $I_{DQ} = 60$ mA, $P_{IN} = 25.5$ dBm
<b>Dynamic Characteristics</b>						
Input Capacitance <sup>5</sup>	$C_{GS}$	-	1.3	-	pF	$V_{DS} = 40$ V, $V_{gs} = -8$ V, $f = 1$ MHz
Output Capacitance <sup>5</sup>	$C_{DS}$	-	0.31	-	pF	$V_{DS} = 40$ V, $V_{gs} = -8$ V, $f = 1$ MHz
Feedback Capacitance	$C_{GD}$	-	0.04	-	pF	$V_{DS} = 40$ V, $V_{gs} = -8$ V, $f = 1$ MHz

## Notes:

<sup>1</sup> Measured on wafer prior to packaging<sup>2</sup> Scaled from PCM data<sup>3</sup> Measured in Cree's production test fixture. This fixture is designed for high volume testing at 5.925 GHz<sup>4</sup> Unmodulated Pulsed Signal 100  $\mu$ s, 10% duty cycle<sup>5</sup> Includes package



### Electrical Characteristics When Tested in CGHV1F006S-AMP1 at C-Band Under OQPSK

Characteristics	Symbol	Min.	Typ.	Max.	Units	Conditions
<b>RF Characteristics<sup>1</sup> (<math>T_c = 25^\circ\text{C}</math>, <math>F_0 = 5.8 - 7.2\text{ GHz}</math> unless otherwise noted)</b>						
Gain	G	-	17.5	-	dB	$V_{DD} = 40\text{ V}$ , $I_{DQ} = 60\text{ mA}$ , $P_{IN} = 0\text{ dBm}$
Output Power <sup>2</sup>	$P_{OUT}$	-	39	-	dBm	$V_{DD} = 40\text{ V}$ , $I_{DQ} = 60\text{ mA}$ , $P_{IN} = 27\text{ dBm}$
Drain Efficiency <sup>2</sup>	$\eta$	-	55	-	%	$V_{DD} = 40\text{ V}$ , $I_{DQ} = 60\text{ mA}$ , $P_{IN} = 27\text{ dBm}$
OQPSK <sup>3</sup>	ACLR	-	-36	-	dBc	$V_{DD} = 40\text{ V}$ , $I_{DQ} = 60\text{ mA}$ , $P_{OUT} = 33\text{ dBm}$
Output Mismatch Stress <sup>2</sup>	VSWR	-	10:1	-	$\Psi$	No damage at all phase angles, $V_{DS} = 40\text{ V}$ , $I_{DQ} = 60\text{ mA}$

Notes:

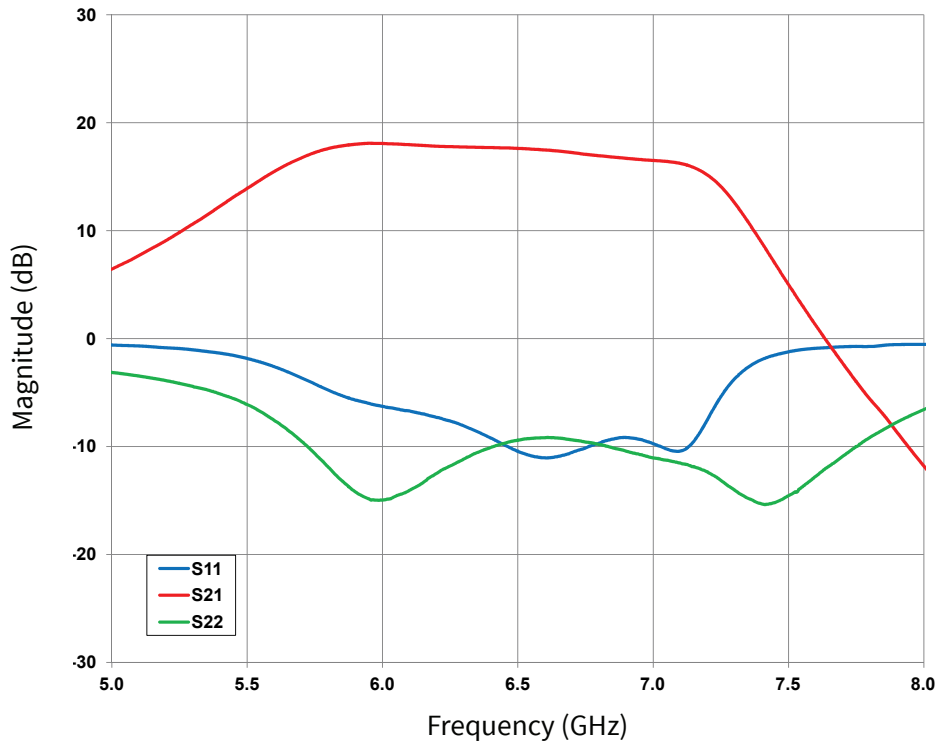
<sup>1</sup> Measured in CGHV1F006S-AMP1 Application Circuit

<sup>2</sup> Pulsed 100  $\mu\text{s}$ , 10% duty cycle

<sup>3</sup> OQPSK modulated signal, 1.6 msp, PN23, Alpha Filter = 0.2 Offset = 1.6 MHz

### Typical Performance - CGHV1F006S-AMP1 at C-Band Under OQPSK

**Figure 1. Typical Small Signal Response of CGHV1F006S-AMP1 Application Circuit**  
 $V_{DD} = 40\text{ V}$ ,  $I_{DQ} = 60\text{ mA}$





Typical Performance in Application Circuit CGHV1F006S-AMP1

Figure 2. Typical Gain, Efficiency and OQPSK Performance vs Frequency  
 $P_{OUT} = 33 \text{ dBm}$ ,  $V_{DD} = 40 \text{ V}$ ,  $I_{DQ} = 60 \text{ mA}$

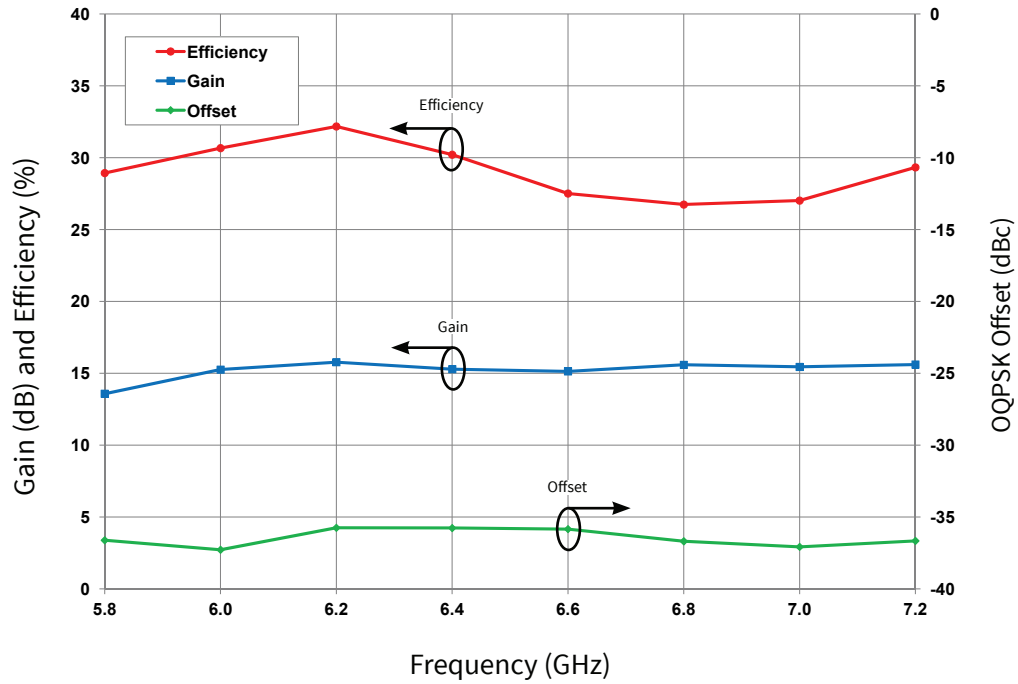
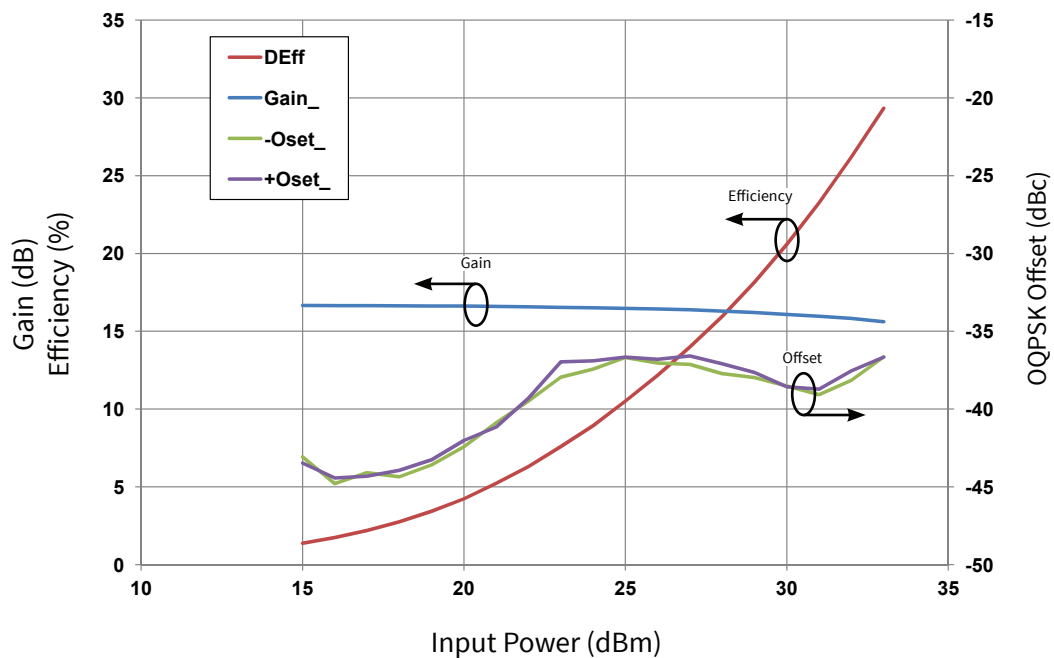


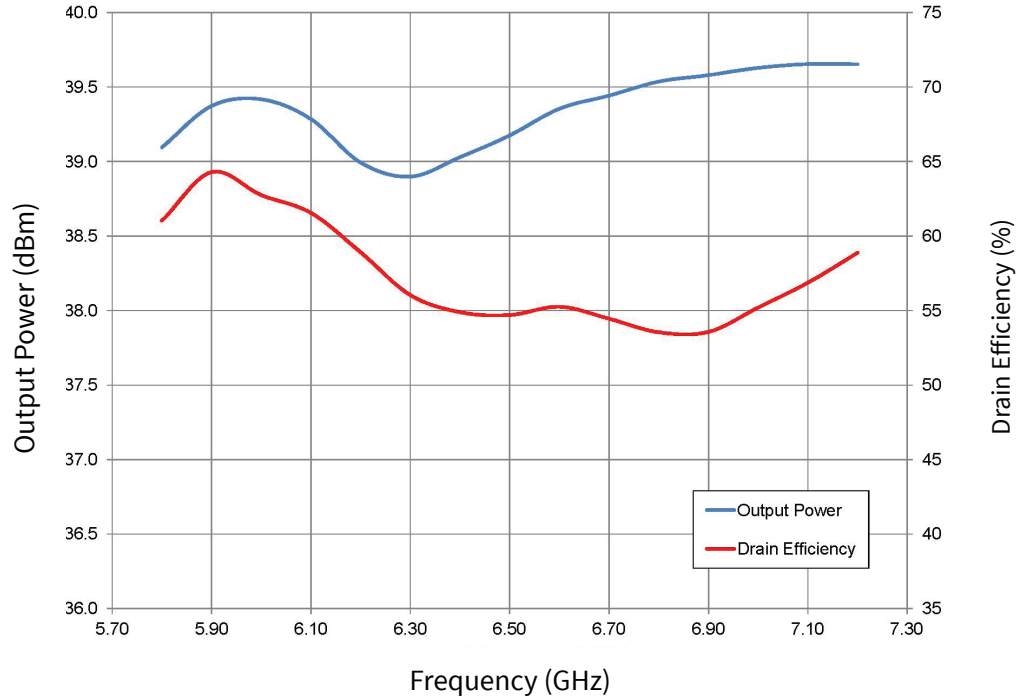
Figure 3. Typical Gain, Efficiency and OQPSK Performance vs Input Power OQPSK Transfer  
 Frequency = 7.2 GHz,  $V_{DD} = 40 \text{ V}$ ,  $I_{DQ} = 60 \text{ mA}$





**Typical Performance in Application Circuit CGHV1F006S-AMP1**

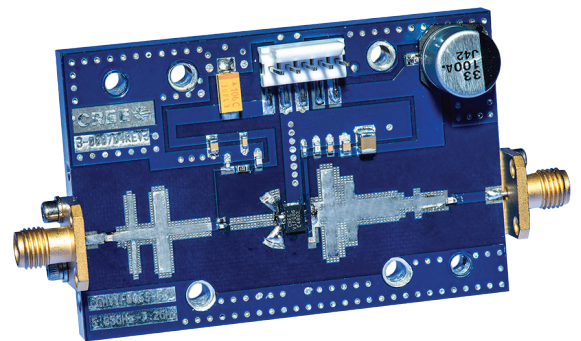
**Figure 4. Typical Pulsed Power Response**  
 $V_{DD} = 40\text{ V}$ ,  $I_{DQ} = 60\text{ mA}$ ,  $100\ \mu\text{s}$ ,  $10\%$  Duty,  $P_{IN} = 27\text{ dBm}$



**CGHV1F006S-AMP1 Application Circuit**  
**Bill of Materials, OQPSK**

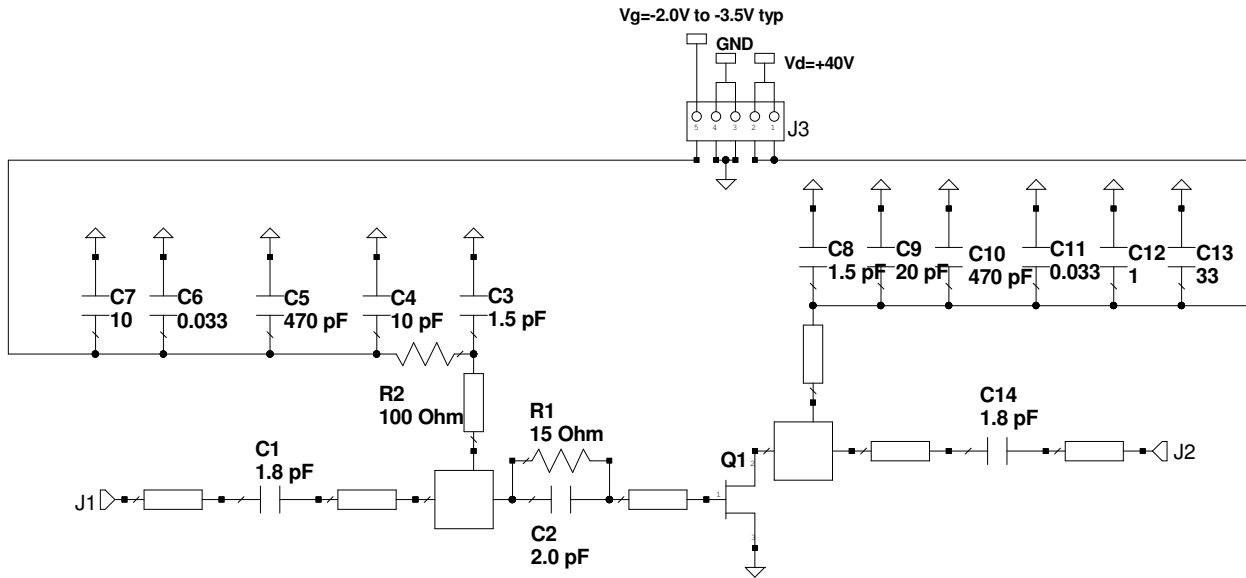
Designator	Description	Qty
R1	RES, 15, OHM, +1/-1%, 1/16 W, 0402	1
R2	RES, 100, OHM, +1/-1%, 1/16 W, 0603	1
C1, C14	CAP, 1.8 pF, ±0.1 pF, 0603, ATC	2
C2	CAP, 2.0 pF, ±0.1 pF, 0402, ATC	1
C3, C8	CAP, 1.5 pF, ±0.1 pF, 0402, ATC	2
C4	CAP, 10 pF, ±5%, 0603, ATC	1
C5, C10	CAP, 470 pF, 5%, 100 V, 0603, X	2
C6, C11	CAP, 33000 pF, 0805, 100V, X7R	2
C7	CAP, 10 UF, 16 V, TANTALUM	1
C9	CAP, 20 pF, ±5%, 0603, ATC	1
C12	CAP, 1.0 UF, 100V, 10% X7R, 1210	1
C13	CAP, 33 UF, 20%, G CASE	1
J1, J2	CONN, SMA, PANEL MOUNT JACK, FLANGE	2
	PCB, RT5880, 0.020" THK, CGHV1F006S	1
J3	HEADER RT>PLZ .1CEN LK 5POS	1
Q1	QFN TRANSISTOR CGHV1F006S	1

**CGHV1F006S-AMP1 Application Circuit**

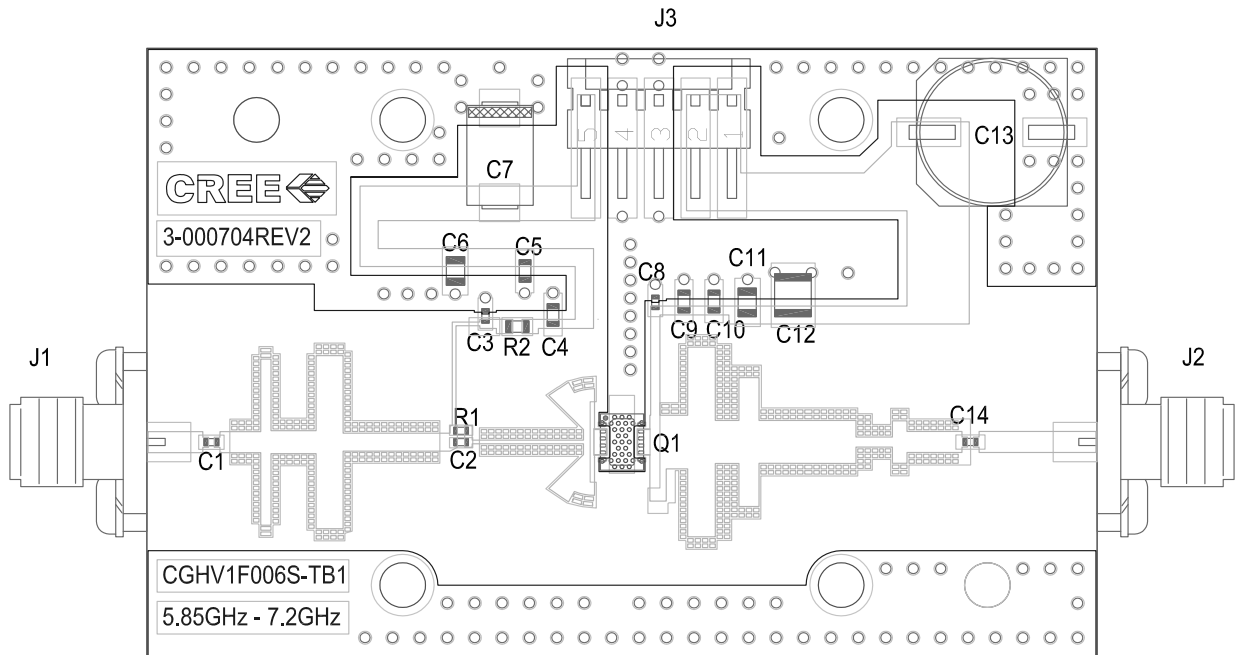




### CGHV1F006S-AMP1 Application Circuit Schematic, OQPSK



### CGHV1F006S-AMP1 Application Circuit Outline, OQPSK





### Electrical Characteristics When Tested in CGHV1F006S-AMP2 at X-Band, SATCOM

Characteristics	Symbol	Min.	Typ.	Max.	Units	Conditions
<b>RF Characteristics<sup>1</sup> (T<sub>c</sub> = 25 °C, F<sub>0</sub> = 7.9 - 8.4 GHz unless otherwise noted)</b>						
Gain	G	-	15	-	dB	V <sub>DD</sub> = 40 V, I <sub>DQ</sub> = 60 mA, P <sub>IN</sub> = 0 dBm
Output Power <sup>2</sup>	P <sub>OUT</sub>	-	39	-	dBm	V <sub>DD</sub> = 40 V, I <sub>DQ</sub> = 60 mA, P <sub>IN</sub> = 28 dBm
Drain Efficiency <sup>2</sup>	η	-	55	-	%	V <sub>DD</sub> = 40 V, I <sub>DQ</sub> = 60 mA, P <sub>IN</sub> = 28 dBm
OQPSK <sup>3</sup>	ACLR	-	-37	-	dBc	V <sub>DD</sub> = 40 V, I <sub>DQ</sub> = 60 mA, P <sub>OUT</sub> = 33 dBm
Output Mismatch Stress <sup>2</sup>	VSWR	-	10 : 1	-	Ψ	No damage at all phase angles, V <sub>DD</sub> = 40 V, I <sub>DQ</sub> = 60 mA, P <sub>IN</sub> = 28 dBm

Notes:

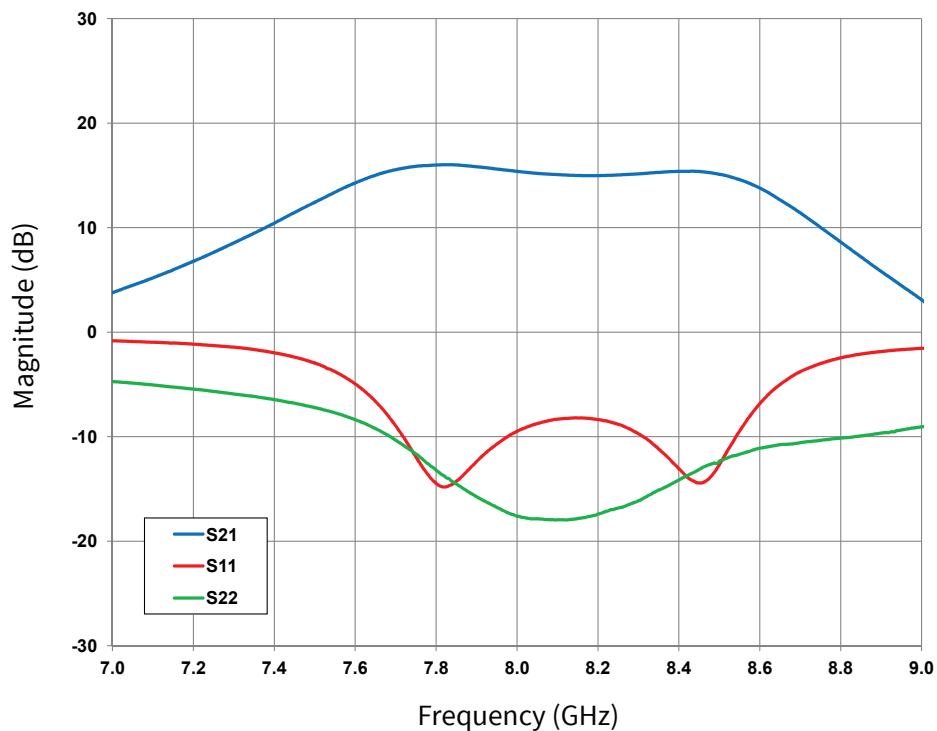
<sup>1</sup> Measured in CGHV1F006S-AMP2 Application Circuit

<sup>2</sup> Pulsed 100 μs, 10% duty cycle

<sup>3</sup> OQPSK modulated signal, 1.6 msps, PN23, Alpha Filter = 0.2 Offset = 1.6 MHz

### Typical Performance in Application Circuit CGHV1F006S-AMP2 at X-Band, SATCOM

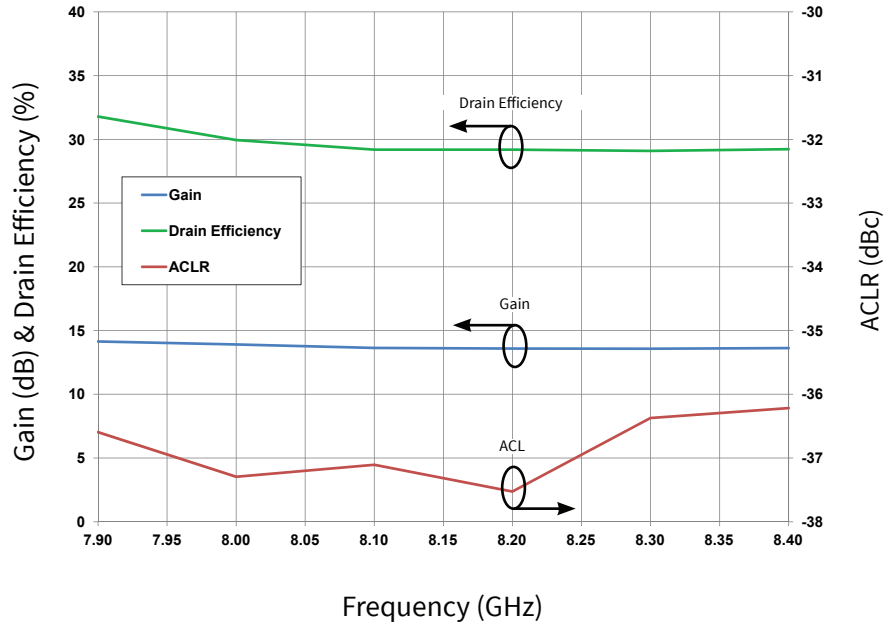
**Figure 5. Typical Small Signal Response of CGHV1F006S-AMP2 Application Circuit**  
 V<sub>DD</sub> = 40 V, I<sub>DQ</sub> = 60 mA





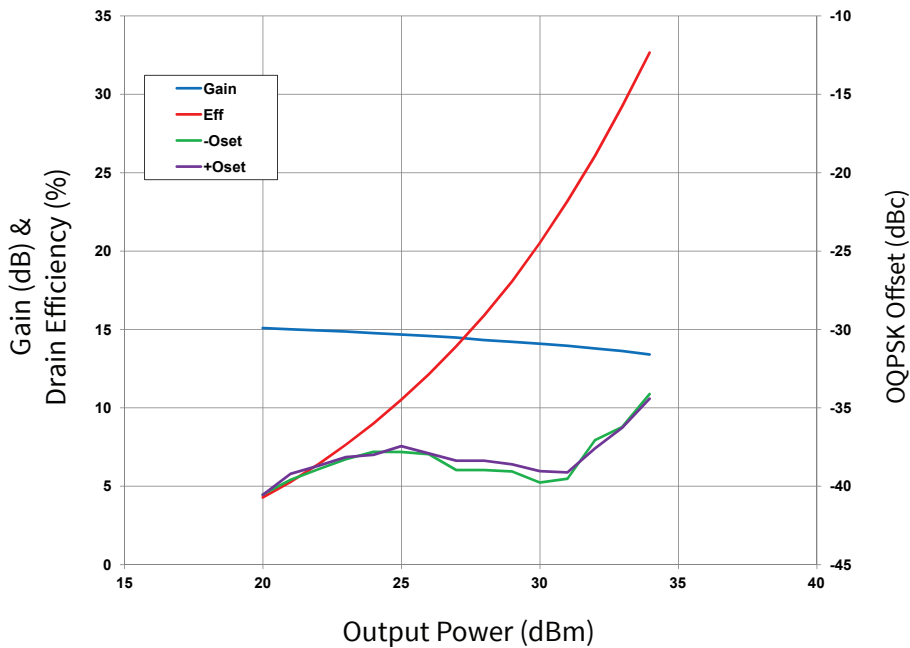
Typical Performance in Application Circuit CGHV1F006S-AMP2

**Figure 6. Typical OQPSK Response**  
 $V_{DD} = 40\text{ V}$ ,  $I_{DQ} = 60\text{ mA}$ ,  $1.6\text{ MSPS}$ ,  $P_{OUT} = 33\text{ dBm}$



Typical Performance in Application Circuit CGHV1F006S-AMP2

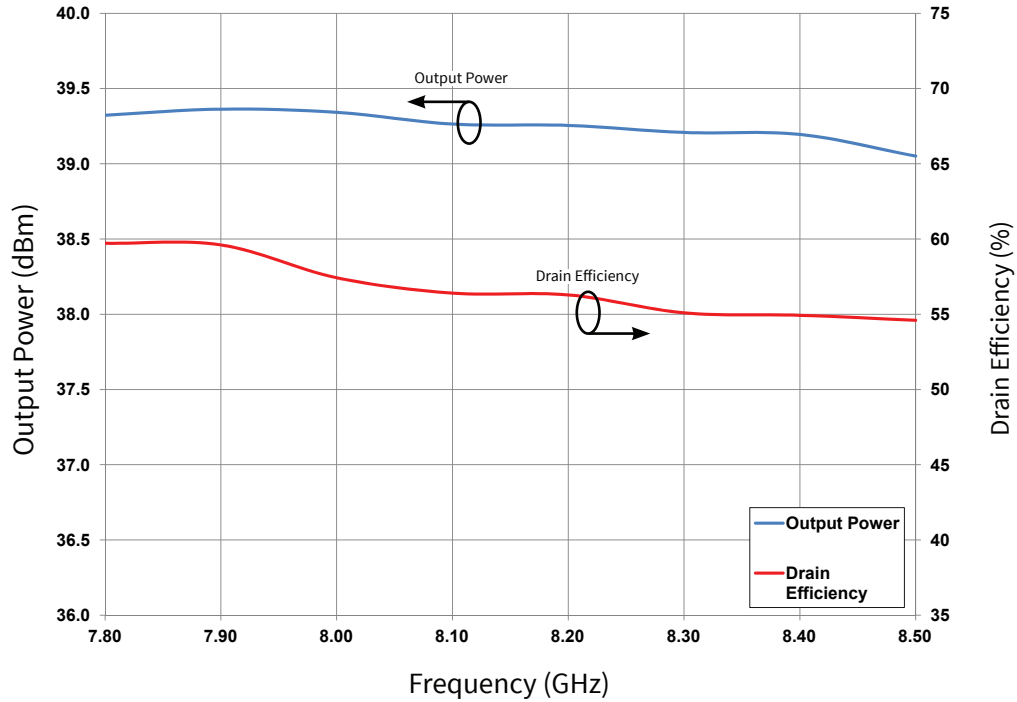
**Figure 7. OQPSK Transfer Response**  
 $V_{DD} = 40\text{ V}$ ,  $I_{DQ} = 60\text{ mA}$ ,  $1.6\text{ MSPS}$ , Frequency =  $8.4\text{ GHz}$





Typical Performance in Application Circuit CGHV1F006S-AMP2

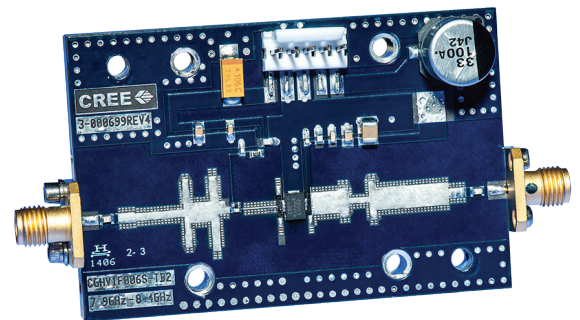
**Figure 8. Typical Pulsed Power Response**  
 $V_{DD} = 40\text{ V}$ ,  $I_{DQ} = 60\text{ mA}$ ,  $100\ \mu\text{s}$ ,  $10\%$  Duty,  $P_{IN} = 28\text{ dBm}$



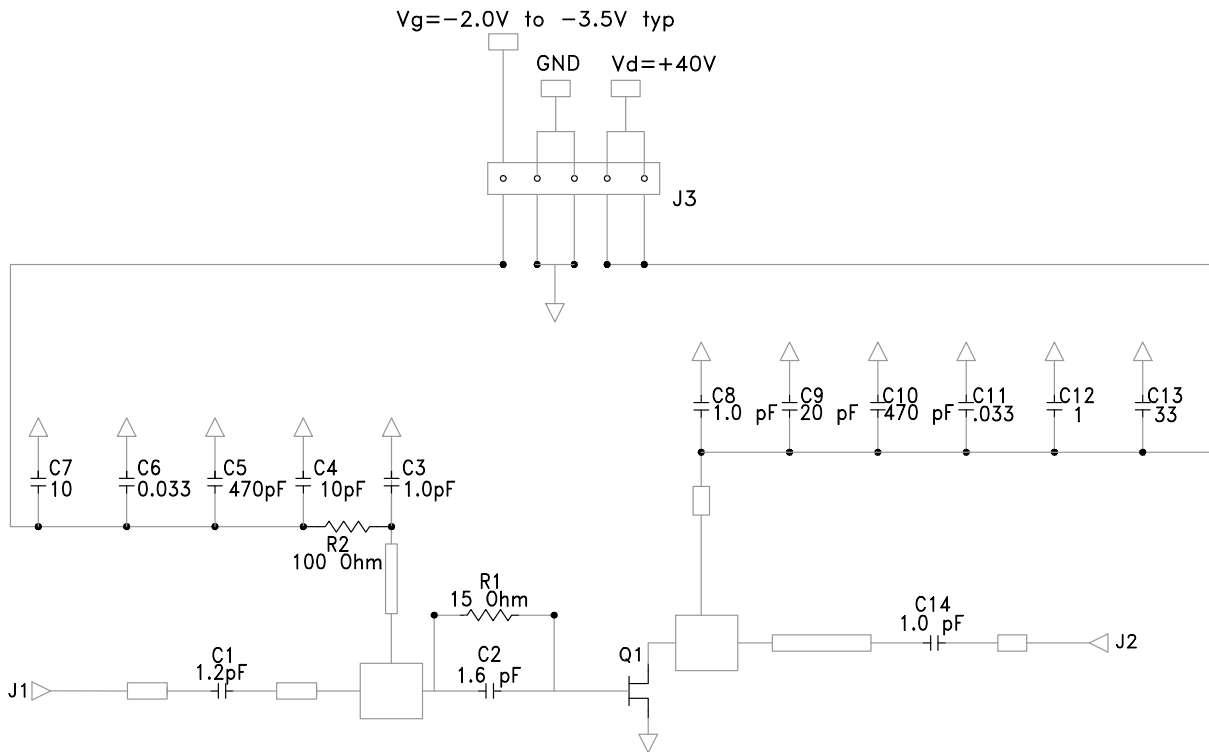
**CGHV1F006S-AMP2 Application Circuit**  
**Bill of Materials, SATCOM**

Designator	Description	Qty
R1	RES, 15, OHM, +1/-1%, 1/16 W, 0402	1
R2	RES, 100, OHM, +1/-1%, 1/16 W, 0603	1
C3, C8	CAP, 1.0pF, ±0.05 pF, 0402, ATC	2
C14	CAP, 1.0pF, ±5%, 0603, ATC	1
C1	CAP, 1.2pF, ±5%, 0603, ATC	1
C2	CAP, 1.6pF, ±5%, 0402, ATC	1
C4	CAP, 10pF, ±5%, 0603, ATC	1
C5, C10	CAP, 470pF, 5%, 100V, 0603, X	2
C6, C11	CAP, 33000pF, 0805, 100V, X7R	2
C7	CAP, 10 UF, 16 V, TANTALUM	1
C9	CAP, 20 pF, ±5%, 0603, ATC	1
C12	CAP, 1.0 UF, 100V, 10% X7R, 1210	1
C13	CAP, 33 UF, 20%, G CASE	1
J1, J2	CONN, SMA, PANEL MOUNT JACK, FLANGE	2
	PCB, RT5880, 0.020" THK, CGHV1F006S	1
	BASEPLATE, AL, 2.60 X 1.70 X 2.50	1
J3	HEADER RT>PLZ .1CEN LK 5POS	1
	2-56 SOC HD SCREW 1/4 SS	4
	#2 SPLIT LOCKWASHER SS	4
Q1	QFN TRANSISTOR CGHV1F006S	1

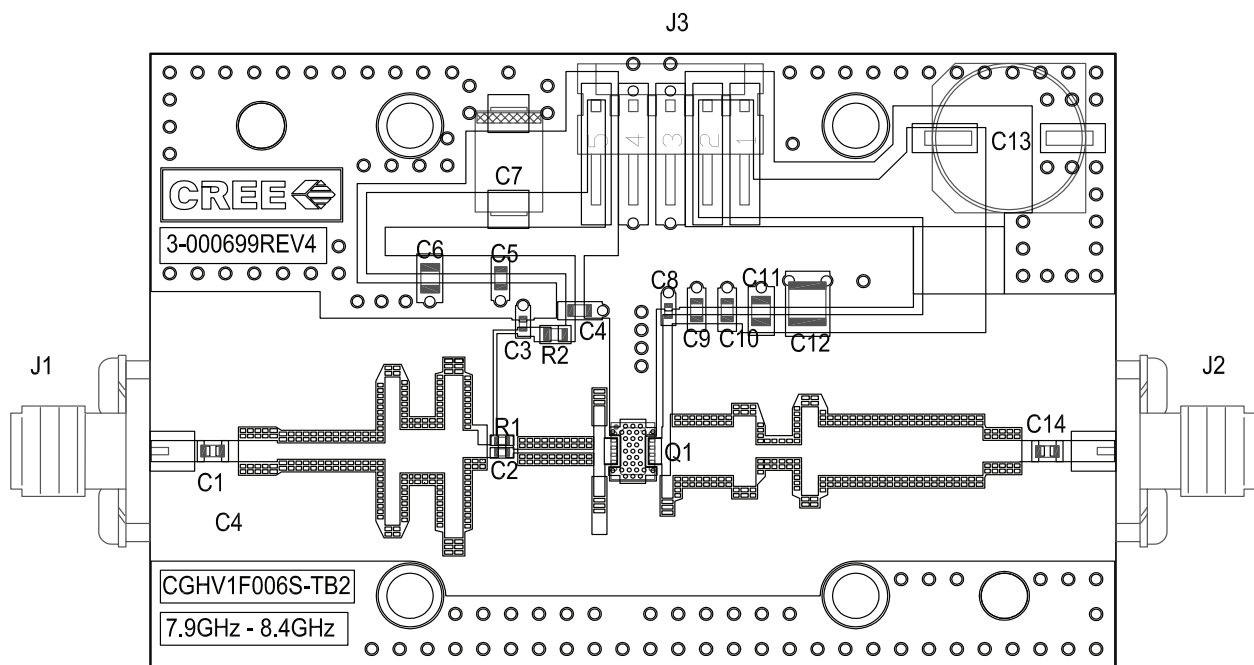
**CGHV1F006S-AMP2 Application Circuit**



### CGHV1F006S-AMP2 Application Circuit Schematic, SATCOM



### CGHV1F006S-AMP2 Application Circuit Outline, SATCOM



### Electrical Characteristics When Tested in CGHV1F006S-AMP3 at X-Band, RADAR

Characteristics	Symbol	Min.	Typ.	Max.	Units	Conditions
<b>RF Characteristics<sup>1</sup> (<math>T_c = 25^\circ\text{C}</math>, <math>F_0 = 8.5 - 9.6\text{ GHz}</math> unless otherwise noted)</b>						
Gain	G	-	14.5	-	dB	$V_{DD} = 40\text{ V}$ , $I_{DQ} = 60\text{ mA}$ , $P_{IN} = 0\text{ dBm}$
Output Power <sup>2</sup>	$P_{OUT}$	-	38.5	-	dBm	$V_{DD} = 40\text{ V}$ , $I_{DQ} = 60\text{ mA}$ , $P_{IN} = 28\text{ dBm}$
Drain Efficiency <sup>2</sup>	$\eta$	-	52	-	%	$V_{DD} = 40\text{ V}$ , $I_{DQ} = 60\text{ mA}$ , $P_{IN} = 28\text{ dBm}$
Output Mismatch Stress <sup>2</sup>	VSWR	-	10 : 1	-	Y	$V_{DD} = 40\text{ V}$ , $I_{DQ} = 60\text{ mA}$ , $P_{IN} = 28\text{ dBm}$

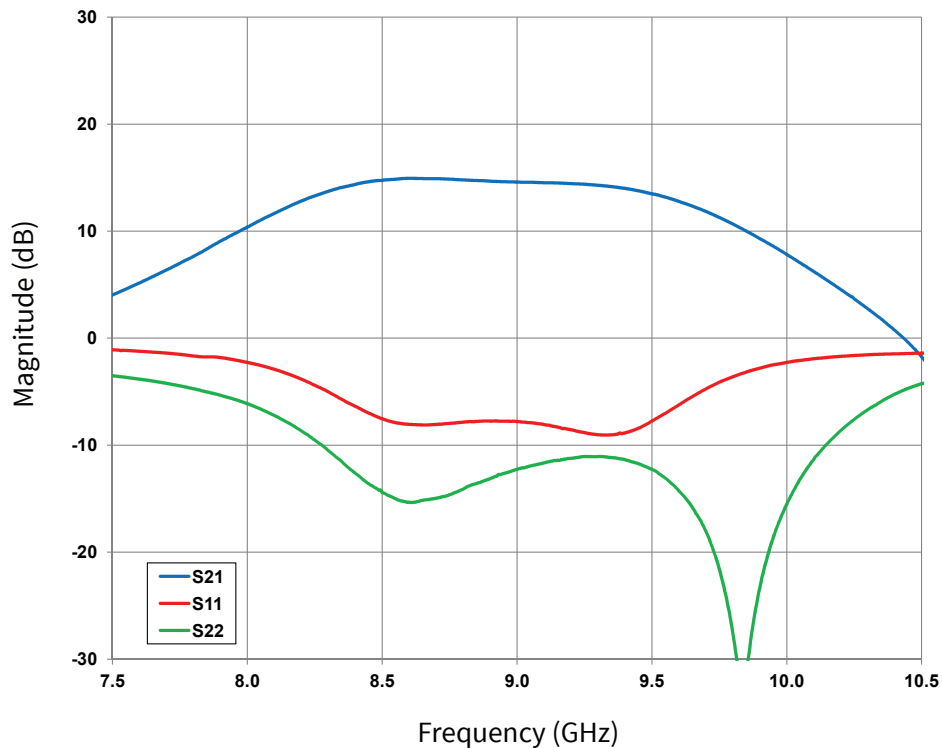
Notes:

<sup>1</sup> Measured in CGHV1F006S-AMP3 Application Circuit

<sup>2</sup> Pulsed 100  $\mu\text{s}$ , 10% duty cycle

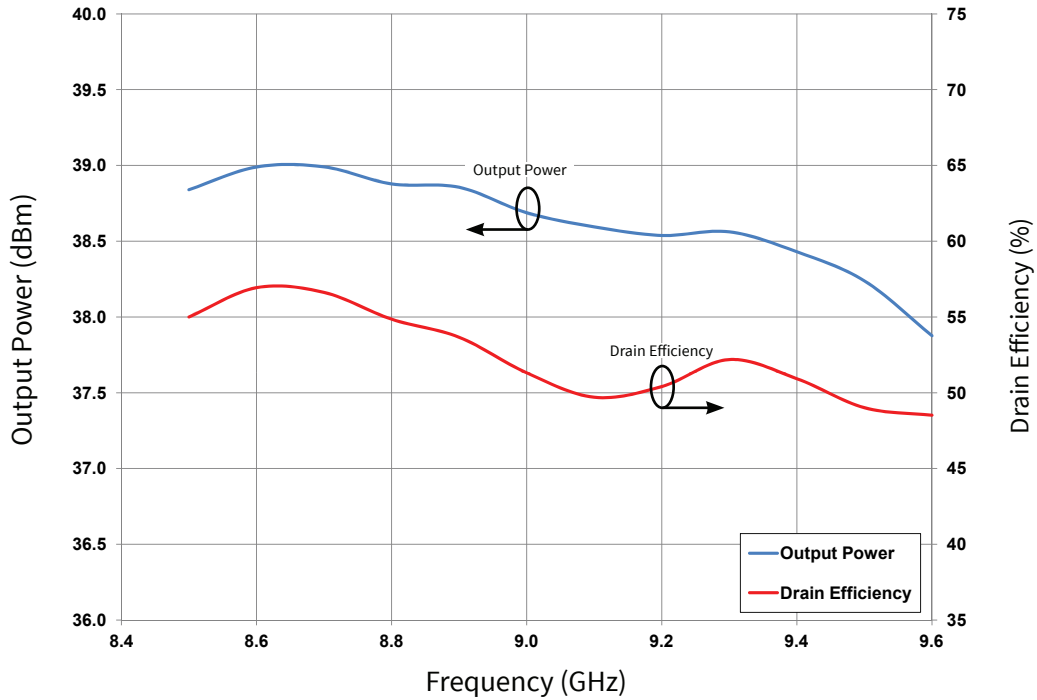
### Typical Performance in Application Circuit CGHV1F006S-AMP3 at X-Band, RADAR

**Figure 9. Typical Small Signal Response**  
 $V_{DD} = 40\text{ V}$ ,  $I_{DQ} = 60\text{ mA}$



Typical Performance in Application Circuit CGHV1F006S-AMP3

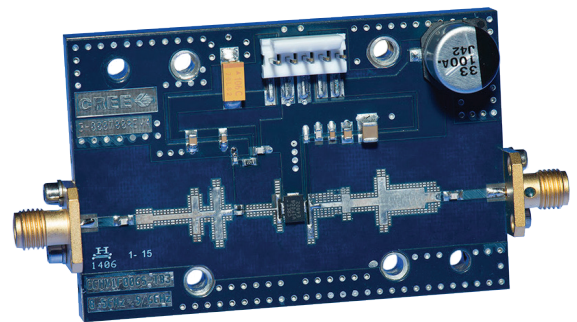
Figure 10. Typical Pulsed Power Response  
 $V_{DD} = 40\text{ V}$ ,  $I_{DQ} = 60\text{ mA}$ ,  $100\ \mu\text{s}$ ,  $10\%$  Duty,  $P_{IN} = 28\text{ dBm}$



CGHV1F006S-AMP3 Application Circuit  
 Bill of Materials, RADAR

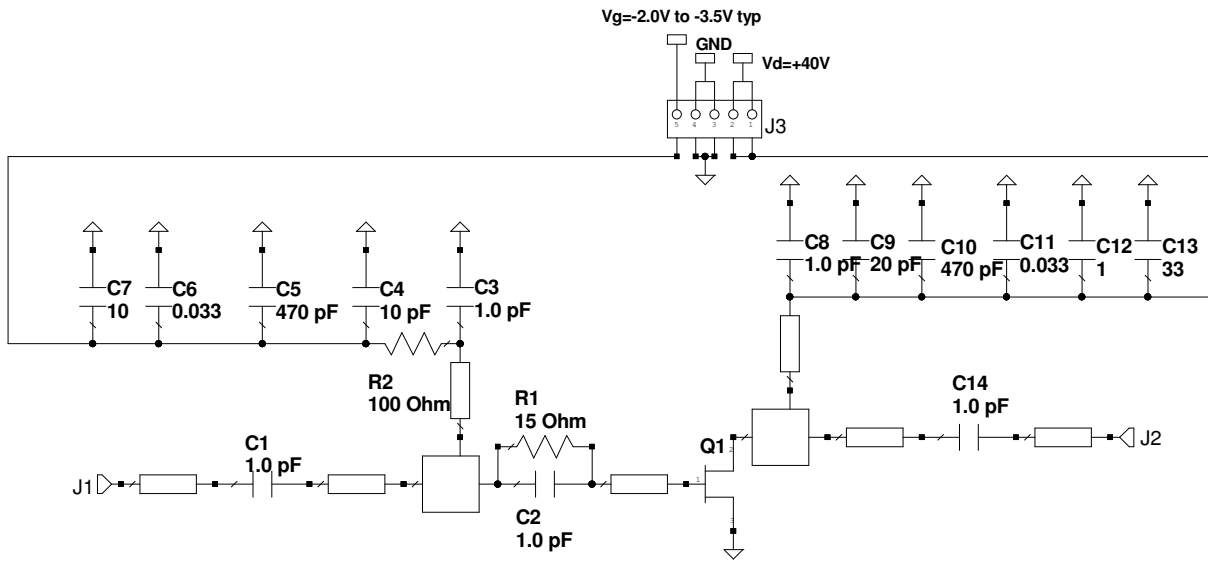
Designator	Description	Qty
R1	RES, 15, OHM, +/-1%, 1/16 W, 0402	1
R2	RES, 100, OHM, +/-1%, 1/16 W, 0603	1
C1, C14	CAP, 1.0 pF, ±0.05 pF, 0603, ATC	2
C2	CAP, 1.0 pF, ±0.05 pF, 0402, ATC	1
C3, C8	CAP, 0.8 pF, ±0.05 pF, 0402, ATC	2
C4	CAP, 10 pF, ±5%, 0603, ATC	1
C5, C10	CAP, 470 pF, 5%, 100 V, 0603, X	2
C6, C11	CAP, 33000 pF, 0805, 100V, X7R	2
C7	CAP, 10 UF, 16 V, TANTALUM	1
C9	CAP, 20 pF, ±5%, 0603, ATC	1
C12	CAP, 1.0 UF, 100V, 10% X7R, 1210	1
C13	CAP, 33 UF, 20%, G CASE	1
J1, J2	CONN, SMA, PANEL MOUNT JACK, FLANGE	2
J3	HEADER RT>PLZ .1CEN LK 5POS	1
Q1	QFN TRANSISTOR CGHV1F006S	1

CGHV1F006S-AMP3 Application Circuit

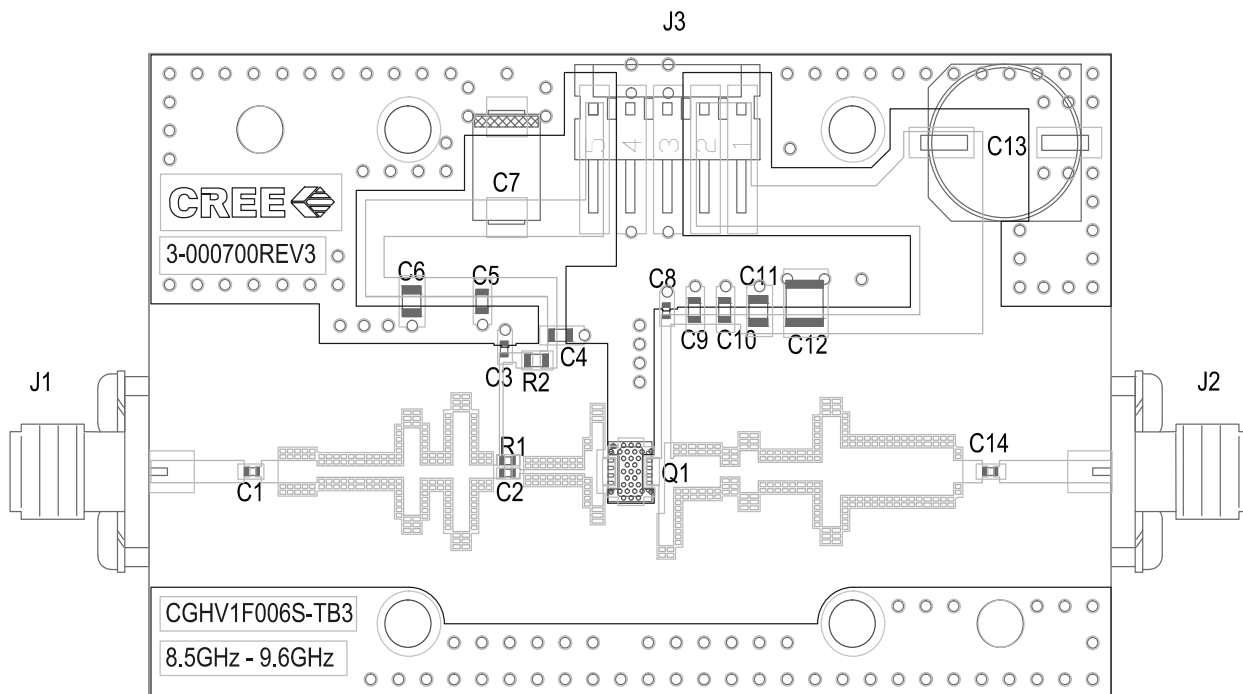




### CGHV1F006S-AMP3 Application Circuit Schematic, RADAR



### CGHV1F006S-AMP3 Application Circuit Outline, RADAR



### Electrical Characteristics When Tested in CGHV1F006S-AMP4 at 802.11

Characteristics	Symbol	Min.	Typ.	Max.	Units	Conditions
<b>RF Characteristics<sup>1</sup> (<math>T_c = 25^\circ\text{C}</math>, <math>F_0 = 4.9 - 5.9\text{ GHz}</math> unless otherwise noted)</b>						
Gain	G	-	13	-	dB	$V_{DD} = 20\text{ V}$ , $I_{DQ} = 30\text{ mA}$ , $P_{IN} = 27\text{ dBm}$
Drain Efficiency <sup>2</sup>	$\eta$	-	27	-	%	$V_{DD} = 20\text{ V}$ , $I_{DQ} = 30\text{ mA}$ , $P_{IN} = 27\text{ dBm}$
OQPSK <sup>3</sup>	ACLR	-	-43	-	dBc	$V_{DD} = 20\text{ V}$ , $I_{DQ} = 30\text{ mA}$ , $P_{OUT} = 27\text{ dBm}$
Output Mismatch Stress <sup>2</sup>	VSWR	-	10 : 1	-	$\Psi$	No damage at all phase angles, $V_{DD} = 20\text{ V}$ , $I_{DQ} = 30\text{ mA}$ , $P_{IN} = 27\text{ dBm}$

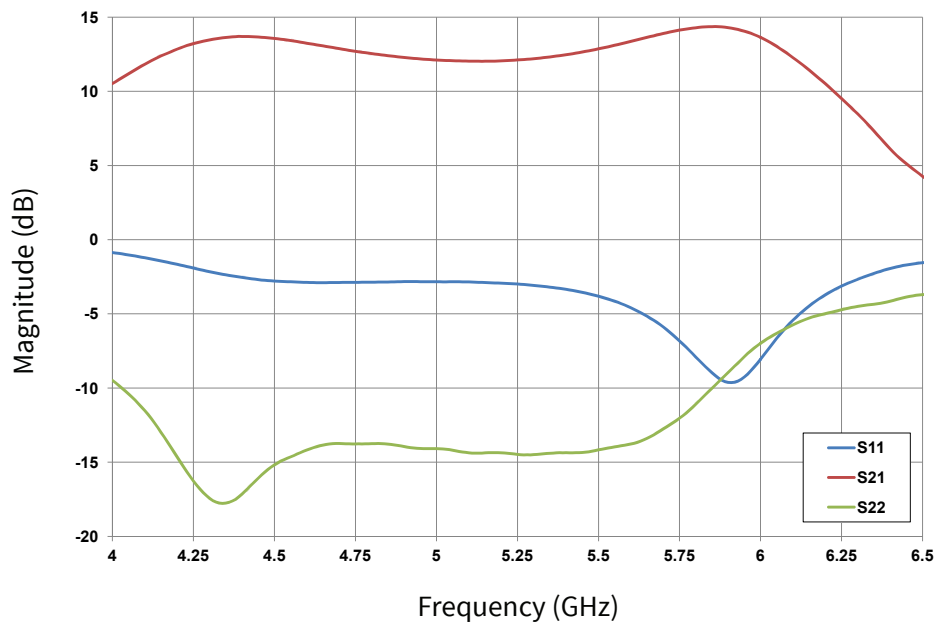
Notes:

<sup>1</sup> Measured in CGHV1F006S-AMP4 Application Circuit

<sup>2</sup> Single carrier WCDMA, 3GPP Test Model 1, G4 DPCH, 45% clipping, PAR = 7.5 dB @ 0.01% probability on CCDF

### Typical Performance - CGHV1F006S-AMP4 at 802.11

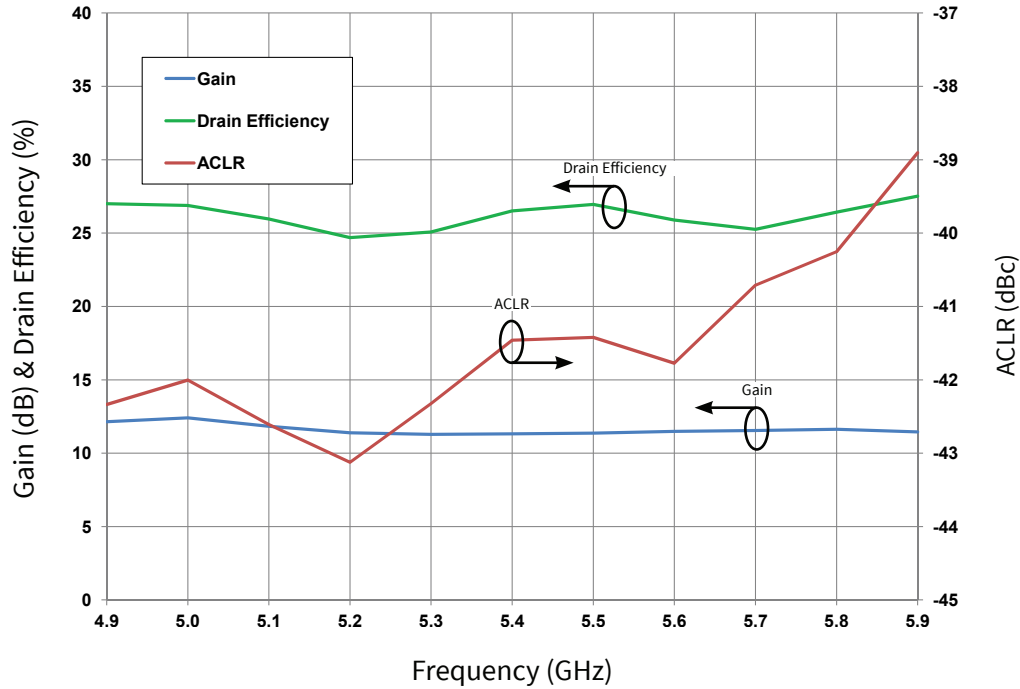
**Figure 11. Typical Small Signal Response**  
 $V_{DD} = 20\text{ V}$ ,  $I_{DQ} = 30\text{ mA}$



Typical Performance in Application Circuit CGHV1F006S-AMP4

Figure 12. Typical Gain, Efficiency and WCDMA Performance vs Frequency

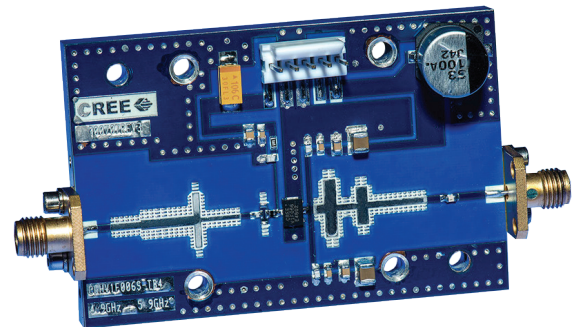
$V_{DD} = 20\text{ V}$ ,  $I_{DQ} = 30\text{ mA}$ ,  $P_{OUT} = 27\text{ dBm}$



CGHV1F006S-AMP4 Application Circuit  
Bill of Materials at 802.11

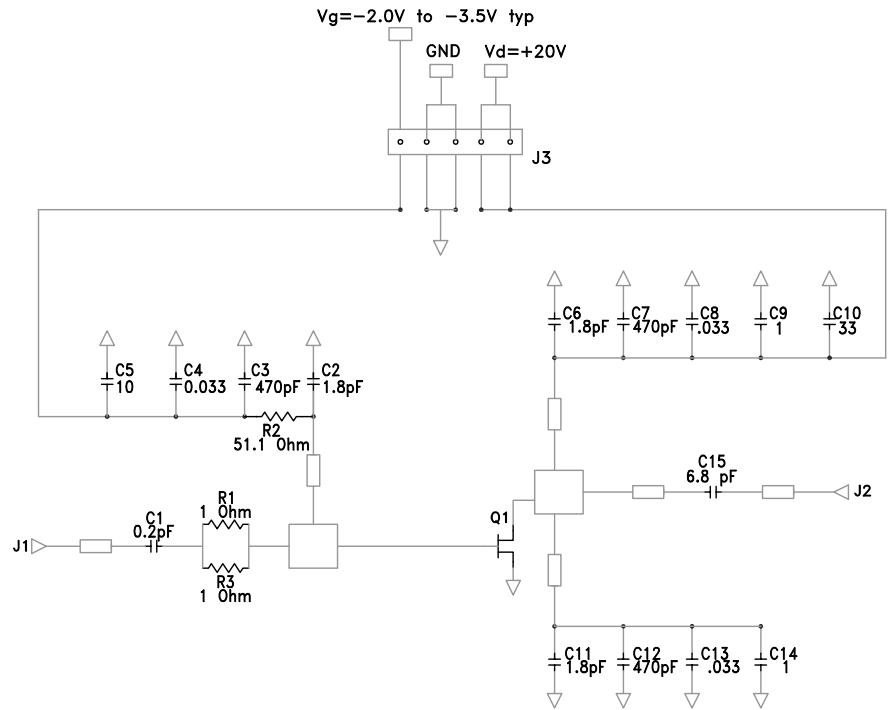
Designator	Description	Qty
R1, R3	RES, 1, OHM, +/-1%, 1/16 W, 0402	2
R2	RES, 51.1, OHM, +/-1%, 1/16W, 0603	1
C2, C6, C11	CAP, 1.8 pF, +/-0.1 pF, 0603, ATC	3
C1	CAP, 0.2 pF, +/-0.05 pF, 0402, ATC	1
C3, C7, C12	CAP, 470 pF, 5%, 100 V, 0603, X	3
C4, C8, C13	CAP, 33000 pF, 0805, 100 V, X7R	3
C5	CAP, 10 UF, 16 V, TANTALUM	1
C15	CAP, 6.8 pF, ±0.25 pF, 100 V, 0603	1
C9, C14	CAP, 1.0 UF, 100V, 10% X7R, 1210	2
C10	CAP, 33 UF, 20%, G CASE	1
J1, J2	CONN, SMA, PANEL MOUNT JACK, FLANGE	2
	PCB, RO4350B, 0.020" THK, CGHV1F006S	1
	BASEPLATE, CGH35015, 2.60 X 1.7	1
J3	HEADER RT>PLZ .1CEN LK 5POS	1
	2-56 SOC HD SCREW 1/4 SS	4
	#2 SPLIT LOCKWASHER SS	4
Q1	QFN TRANSISTOR CGHV1F006S	1

CGHV1F006S-AMP4 Application Circuit

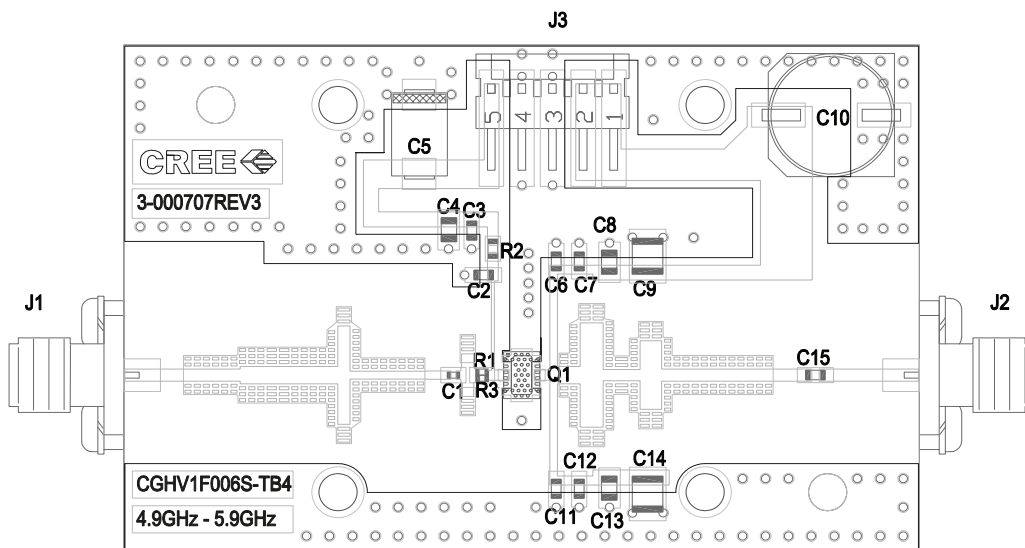




### CGHV1F006S-AMP4 Application Circuit Schematic



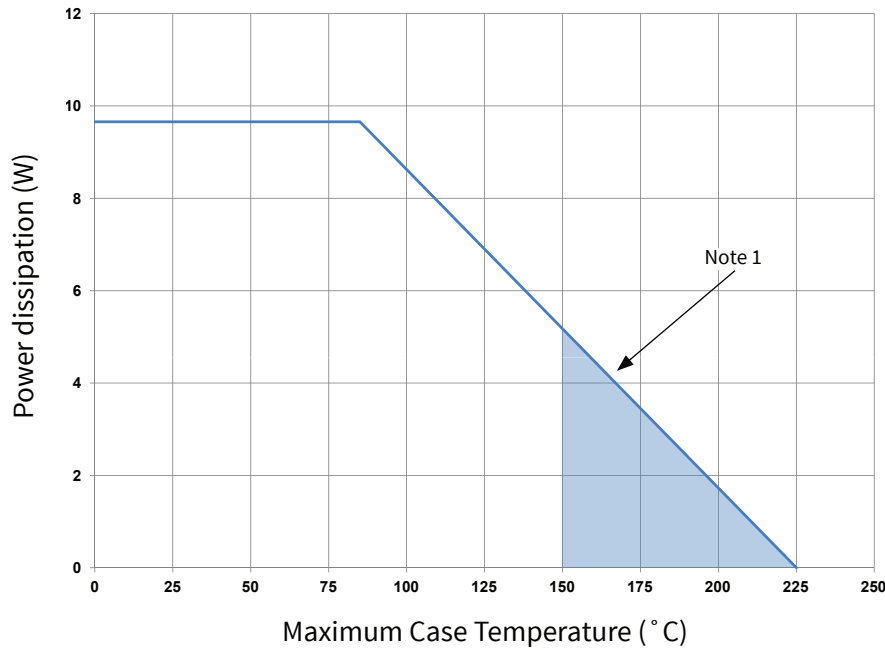
### CGHV1F006S-AMP4 Application Circuit Outline





**CGHV1F006S Power Dissipation De-rating Curve**

**Figure 13. CGHV1F006S Transient Power Dissipation De-Rating Curve**



Note 1. Area exceeds Maximum Case Temperature (See Page 2)

**Electrostatic Discharge (ESD) Classifications**

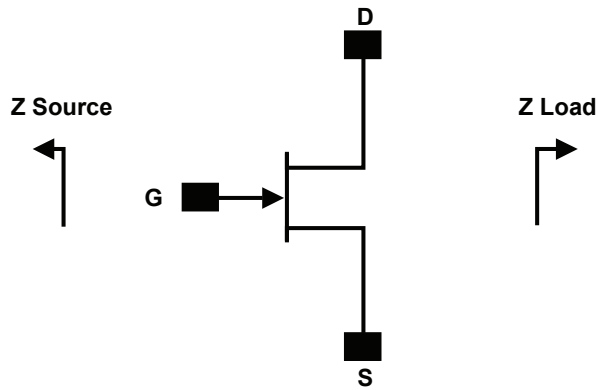
Parameter	Symbol	Class	Test Methodology
Human Body Model	HBM	1B (≥ 500 V)	JEDEC JESD22 A114-D
Charge Device Model	CDM	II (≥ 200 V)	JEDEC JESD22 C101-C

**Moisture Sensitivity Level (MSL) Classification**

Parameter	Symbol	Level	Test Methodology
Moisture Sensitivity Level	MSL	3 (168 hours)	IPC/JEDEC J-STD-20



**Source and Load Impedances**

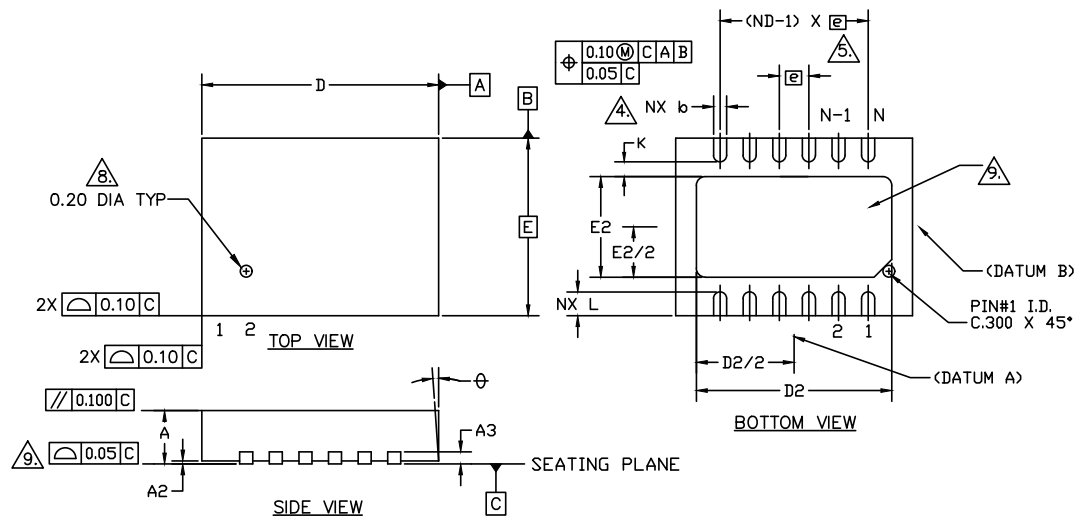


Frequency (GHz)	Z Source	Z Load
1	49.67 + j32.81	184.11 + j6.66
3	11.54 + j3.96	38.83 + j56.37
6	5.94 - j17.97	13.03 + j16.16
10	11.87 - j77.62	11.79 - j17.43
12	47.42 - j205.35	16.39 - j46.22
15	33.78 + j251.03	163.61 - j268.44

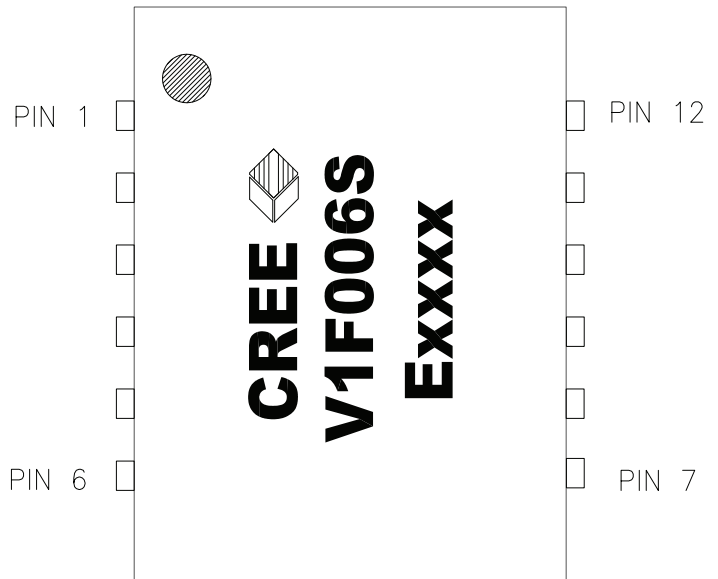
Note 1.  $V_{DD} = 40\text{ V}$ ,  $I_{DQ} = 60\text{ mA}$   
 Note 2. Impedances are extracted from source and load pull data derived from the transistor

**Product Dimensions CGHV1F006S (Package 3 x 4 DFN)**

SYMBOL	COMMON DIMENSIONS			NOTE
	MIN.	NOM.	MAX.	
A	0.80	0.90	1.0	
A1	0.00	0.02	0.05	
A3	0.203 REF.			
⌀	0	—	12	2
D	4.00 BSC			
E	3.00 BSC			
Ⓢ	0.50 BSC			
N	12			3
ND	6			⚠
L	0.35	0.40	0.45	
b	0.18	0.25	0.30	⚠
D2	3.20	3.30	3.40	
E2	1.60	1.7	1.80	
K	0.20	—	—	



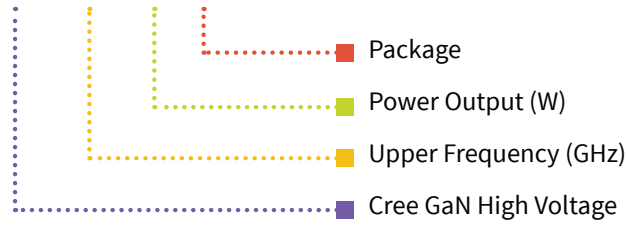
Pin	Input/Output
1	GND
2	NC
3	RF IN
4	RF IN
5	NC
6	GND
7	GND
8	NC
9	RF OUT
10	RF OUT
11	NC
12	GND



Note: Leadframe finish for 3x4 DFN package is Nickel/Palladium/Gold. Gold is the outer layer

**Part Number System**

**CGHV1F006S**



**Table 1.**

Parameter	Value	Units
Upper Frequency <sup>1</sup>	15.0	GHz
Power Output	6	W
Package	Surface Mount	-

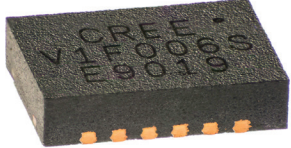
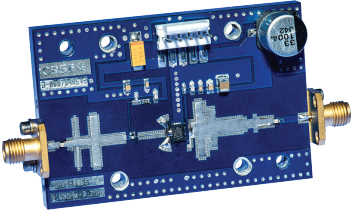
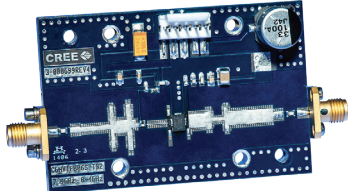
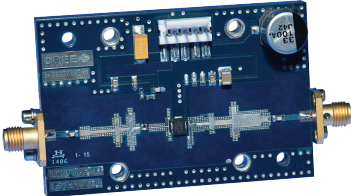
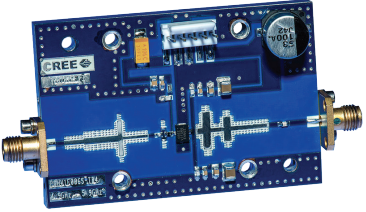
**Note:** Alpha characters used in frequency code indicate a value greater than 9.9 GHz. See Table 2 for value.

**Table 2.**

Character Code	Code Value
A	0
B	1
C	2
D	3
E	4
F	5
G	6
H	7
J	8
K	9
Examples:	1A = 10.0 GHz 2H = 27.0 GHz



**Product Ordering Information**

Order Number	Description	Unit of Measure	Image
CGHV1F006S	GaN HEMT	Each	
CGHV1F006S-AMP1	Test board with GaN HEMT installed, 5.85 - 7.2 GHz, 50 V C-Band under OQPSK	Each	
CGHV1F006S-AMP2	Test board with GaN HEMT installed, 7.9 - 8.4 GHz, 28 V X-Band SATCOM	Each	
CGHV1F006S-AMP3	Test board with GaN HEMT installed, 8.5 - 9.6 GHz, 28 V X-Band RADAR	Each	
CGHV1F006S-AMP4	Test board with GaN HEMT installed, 4.9 - 5.9 GHz, 50 V 802.11	Each	



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