Applications

- 802.11n, MIMO solutions
- IEEE802.11b DSSS WLAN
- IEEE802.11g OFDM WLAN
- IEEE802.11a OFDM WLAN
- Access Points, PCMCIA, PC cards

Features

- 2 Transmit and 2 receive path architecture
- All RF ports matched to 50 Ω
- Integrated 2.4 GHz PA, 5 GHz PA, TX Filter, T/R switches and diplexers
- Integrated Power Detector for each TX Chain
- 18 dBm O/P Power, 802.11b, 11 Mbits, ACPR = 32 dBc
- 18 dBm @ 3.0 % EVM, 802.11g, 54 Mbits
- 15 dBm @ 3.0 % EVM, 802.11a, 54 Mbits
- Single supply voltage: 3.3 V ± 10 %
- Lead free and RoHS compliant
- Thin lead free plated package, 10 mm x 14 mm x 1.1 mm, MSL 3

Ordering Information

Part No.	Package	Remark
SE2545A23	48 pin LGA	Samples
SE2545A23-T	48 pin LGA	Tray
SE2545A23-EK1	N/A	Evaluation kit

Product Description

The SE2545A23 is a complete 802.11n WLAN RF front-end module providing all the functionality of the power amplifiers, power detector, T/R switch, diplexers and associated matching. The SE2545A23 provides a complete 2.4 GHz and 5 GHz WLAN Multiple Input, Multiple Output (MIMO) RF solution from the output of the transceiver to the antennas in an ultra compact form factor.

Designed for ease of use, all RF ports are matched to 50 Ω to simplify PCB layout and the interface to the transceiver RFIC. The SE2545A23 also includes a transmitter power detector for each band and transmit chain with 20 dB of dynamic range for each transmit chain. Each transmit chain has a separate digital enable control for transmitter power ramp on/off control. The power ramp rise/fall time is less than 0.5 µsec.

The device also provides a notch filter from 3.2-3.3 GHz and 3.2-3.9 GHz prior to the input of each 2.4 GHz and 5 GHz power amplifiers, respectively.

Functional Block Diagram

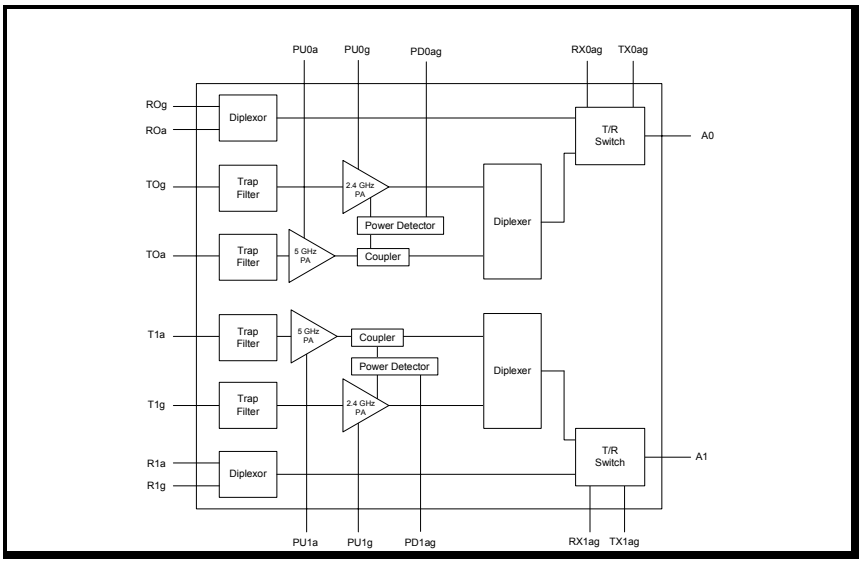

Figure 1: Functional Block Diagram

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Pin Out Diagram

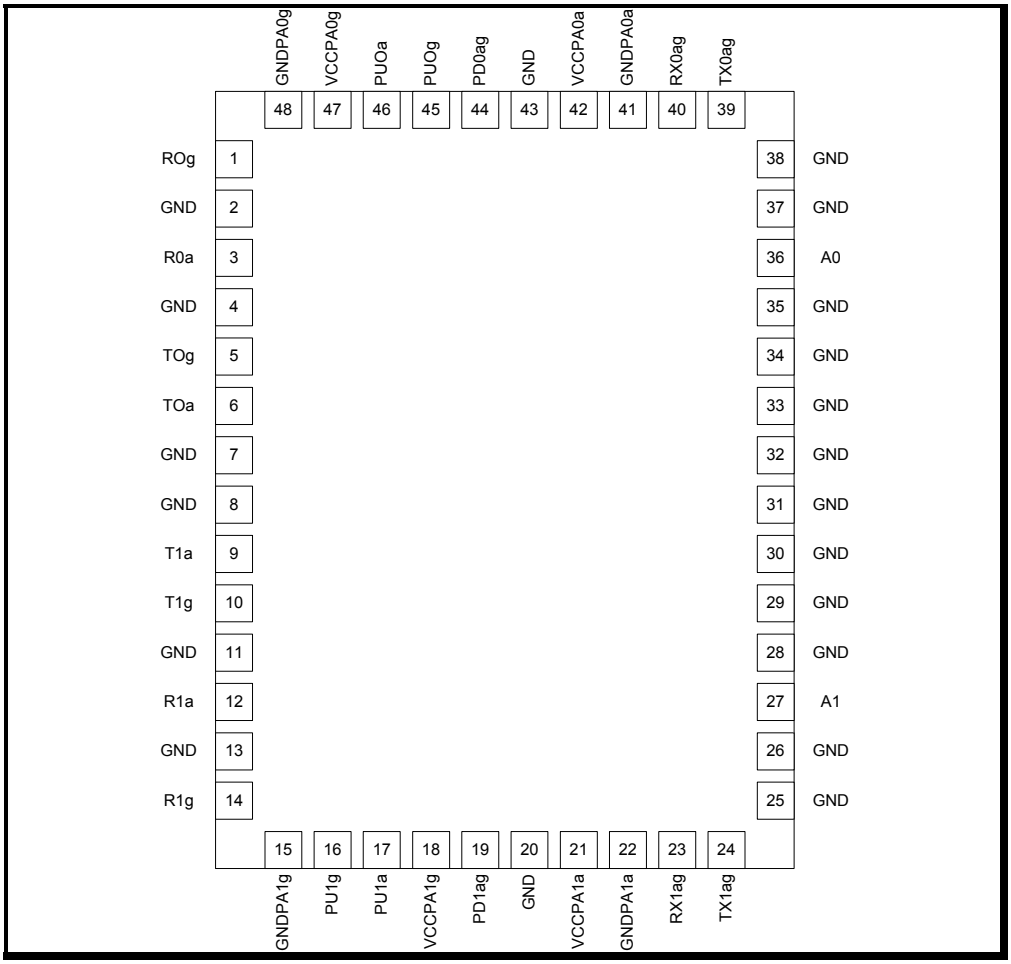

Figure 2: SE2545A23 Pin Out (Top View Through Package)

Pin Out Description

Pin No.	Name	Description
1	R0g	2.4 GHz Receive Output, Channel 0
2	GND	Ground
3	R0a	5 GHz Receive Output, Channel 0
4	GND	Ground
5	T0g	2.4 GHz Transmit Input, Channel 0
6	T0a	5 GHz Transmit Input, Channel 0
7,8	GND	Ground
9	T1a	5 GHz Transmit Input, Channel 1
10	T1g	2.4 GHz Transmit Input, Channel 1
11	GND	Ground
12	R1a	5 GHz Receive Output, Channel 1
13	GND	Ground

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Pin No.	Name	Description
14	R1g	2.4 GHz Receive Output, Channel 1
15	GNDPA1g	Ground
16	PU1g	2.4 GHz PA Enable, Channel 1
17	PU1a	5 GHz PA Enable, Channel 1
18	VCCPA1g	Supply Voltage (Note 1)
19	PD1ag	Dual Band Power Detector, Channel 1
20	GND	Ground
21	VCCPA1a	Supply Voltage (Note 1)
22	GNDPA1a	Ground
23	RX1ag	Rx Switch Select, Channel 1
24	TX1ag	Tx Switch Select, Channel 1
25,26	GND	Ground
27	A1	Antenna, Channel 1
28-35	GND	Ground
36	A0	Antenna, Channel 0
37,38	GND	Ground
39	TX0ag	Tx Switch Select, Channel 0
40	RX0ag	Rx Switch Select, Channel 0
41	GNDPA0a	GND
42	VCCPA0a	Supply Voltage (Note 1)
43	GND	Ground
44	PD0ag	Dual Band Power Detector, Channel 0
45	PU0g	2.4 GHz PA Enable, Channel 0
46	PU0a	5 GHz PA Enable, Channel 0
47	VCCPA0g	Supply Voltage (Note 1)
48	GNDPA0g	Ground

Note 1: All VCC pins need to be always supplied with the supply voltage

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Absolute Maximum Ratings

These are stress ratings only. Exposure to stresses beyond these maximum ratings may cause permanent damage to, or affect the reliability of the device. Avoid operating the device outside the recommended operating conditions defined below. This device is ESD sensitive. Handling and assembly of this device should be at ESD protected workstations.

Symbol	Definition	Min.	Max.	Unit
V_{CC}	VCCPA0g, VCCPA0a, VCCPA1g, VCCPA1a	-0.3	4.0	V
PU	PU0a, PU0g, PU1a, PU1g	-0.3	4.0	V
TX_{RF}	T0a, T0g, T1a, T1g	-	4.0	dBm
T_A	Operating Temperature Range	0	85	°C
T_{STG}	Storage Temperature Range	-40	150	°C

Recommended Operating Conditions

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{CC}	Supply Voltage	3.0	3.3	3.6	V
T_A	Ambient Temperature	0	25	85	°C

DC Electrical Characteristics

Conditions: V_{CC} = 3.3 V, T_A = 25 °C, as measured on SiGe Semiconductor's SE2545A23-EV1 evaluation board (de-embedded to device), all unused ports terminated with 50 ohms, unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_{CC-G}	Total 802.11g Transmit Supply Current for Channel 0 or Channel 1	P_{OUT} = 18 dBm, 54 Mbps OFDM signal, 64QAM PU0g or PU01g = 3.3 V PU0a and PU1a = 0 V	-	190	-	mA
I_{CC-B}	Total 802.11b Transmit Supply Current for Channel 0 or Channel 1	P_{OUT} = 18 dBm, 11 Mbps CCK signal, BT = 0.45 PU0g or PU01g = 3.3 V PU0a and PU1a = 0 V	-	190	-	mA
I_{CC-A}	Total 802.11a Transmit Supply Current for Channel 0 or Channel 1	P_{OUT} = 15 dBm, 54 Mbps OFDM signal, 64QAM PU0a or PU01a = 3.3 V PU0g and PU1g = 0 V	-	180	-	mA
I_{CC_OFF}	Total Supply Current	No RF, PU0g = PU0a = PU1g = Pu1a = 0 V, TX0ag = RX0ag = TX1ag = RX1ag = 0 V	-	2	20	µA

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Logic Characteristics

Conditions: V_{CC} = 3.3 V, T_A = 25 °C, as measured on SiGe Semiconductor's SE2545A23-EV1 evaluation board (de-embedded to device), all unused ports terminated with 50 ohms, unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{ENH}	Logic High Voltage for PU0g, PU0a, PU1g, PU1a (Module On)	-	2.0	-	V_{CC}	V
V_{ENL}	Logic Low Voltage PU0g, PU0a, PU1g, PU1a (Module Off)	-	0	-	0.5	V
I_{ENH}	Input Current Logic High Voltage (PU0g, PU0a, PU1g, PU1a)	-	-	100	200	µA
I_{ENL}	Input Current Logic Low Voltage (PU0g, PU0a, PU1g, PU1a)	-	-	0.2	-	µA

Switch Characteristics

Conditions: V_{CC} = V_{EN} = 3.3 V, T_A = 25 °C, as measured on SiGe Semiconductor's SE2545A23-EV1 evaluation board (de-embedded to device), all unused ports terminated with 50 ohms, unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{CTL_ON}	Control Voltage (On State)	-	3.0	-	3.6	V
V_{CTL_OFF}	Control Voltage (OFF State)	-	0.0	-	0.2	V
SW_{ON}	Low Loss Switch Control Voltage	High State = V_{CTL_ON} - V_{CTL_OFF}	2.8	-	V_{CC}	V
SW_{OFF}	High Loss Switch Control Voltage	Low State = V_{CTL_OFF} - V_{CTL_OFF}	0	-	0.3	V
I_{CTL_ON}	Switch Control Bias Current (RF Applied)	On pin (TX0ag, RX0ag, TX1ag, RX1ag) being driven high. RF Applied	-	-	100	µA
I_{CTL_ON}	Switch Control Bias Current (No RF)	On pin (TX0ag, RX0ag, TX1ag, RX1ag) being driven high. No RF	-	-	30	µA
C_{CTL}	Control Input Capacitance	-	-	-	100	pF

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Switch Control Logic Table

Switch Logic				Operational Mode			
TX0ag	**RX0ag**	**TX1ag**	**RX1ag**	**T0g, T0a – ANT0**	**R0g, R0a – ANT0**	**T1g, T1a – ANT1**	**R1g, R1a – ANT1**
SW_{ON}	SW_{OFF}	SW_{OFF}	SW_{OFF}	ON	OFF	OFF	OFF
SW_{OFF}	SW_{ON}	SW_{OFF}	SW_{OFF}	OFF	ON	OFF	OFF
SW_{OFF}	SW_{OFF}	SW_{ON}	SW_{OFF}	OFF	OFF	ON	OFF
SW_{OFF}	SW_{OFF}	SW_{OFF}	SW_{ON}	OFF	OFF	OFF	ON
SW_{ON}	SW_{OFF}	SW_{ON}	SW_{OFF}	ON	OFF	ON	OFF
SW_{OFF}	SW_{ON}	SW_{OFF}	SW_{ON}	OFF	ON	OFF	ON
SW_{OFF}	SW_{OFF}	SW_{OFF}	SW_{OFF}	Unsupported Switch State			

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2.4 GHz AC Electrical Characteristics

2.4 GHz Transmit Characteristics (Channel 0, Channel 1)

Conditions: V_{CC} = 3.3 V, "PU0g and TX0ag" or "PU1g and TX1ag" = 3.3 V, PU0a = PU1a = RX0ag = RX1ag = 0 V, T_A = 25 °C, as measured on SiGe Semiconductor's SE2545A23-EV1 evaluation board (de-embedded to device), all unused ports terminated with 50 ohms, unless otherwise noted.

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
F_{IN}	Frequency Range	-	2400	-	2500	MHz
$P_{802.11g}$	Output power	54 Mbps OFDM signal, 64QAM, EVM = 3.0 %	-	18	-	dBm
$P_{802.11b}$	Output power	11 Mbps CCK signal, BT = 0.45 ACPR(Adj) < -32 ACPR(Alt) < -52	-	18	-	dBm
BEVM	Backed Off EVM	54 Mbps, OFDM signal, 64 QAM, P = 8 dBm	-	1.5	-	%
P_{1dB}	P1dB	-	22.5	25	-	dBm
S_{21}	Small Signal Gain	-	25	-	33	dB
ΔS_{21}	Small Signal Gain Variation Over Band	-	-	1.0	2.5	dB
$S_{21}3.2$	Gain @ 3.2 to 3.3 GHz	-	-	0	4	dB
2f,3f	Harmonics	Pout = 18 dBm, 1 Mbps, 802.11b CCK	-	-	-42	dBm/MHz
IM3	3rd Order Inter-modulation	f1 and f2 at Fc +/- 156.25 kHz, P = 18 dBm	-	-35	-	dBc
IM5	5th Order Inter-modulation	f1 and f2 at Fc +/- 156.25 kHz, P = 18 dBm	-	-45	-	dBc
t_r	Rise Time	10 % to 90% of final output power level	-	-	0.5	µs
t_{dr}, t_{df}	Delay and rise/fall Time	50 % of V_{EN} edge and 90/10 % of final output power level	-	-	0.5	µs
S_{11}	Input Return Loss	-	6	9	-	dB
Tgcoup	Coupling between T0g and T1g	Test Signal applied at T0g or T1g and measured at A0 or A1	20	-	-	dBc
STAB	Stability	P_{OUT} ≤ 18 dBm Load VSWR = 3:1	All non-harmonically related outputs less than -50 dBc/1MHz			

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2.4 GHz Receive Characteristics (Channel 0, Channel 1)

Conditions: V_{CC} = 3.3 V, RX0ag or RX1ag = 3.3V, PU0g = PU1g = PU0a = PU1a = TX0ag = TX1ag = 0 V, T_A = 25 °C, as measured on SiGe Semiconductor's SE2545A23-EV1 evaluation board (de-embedded to device), all unused ports terminated with 50 ohms, unless otherwise noted.

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
F_{OUT}	Frequency Range	-	2400	-	2500	MHz
RX_{IL}	Insertion Loss	-	-	1.5	2.0	dB
RX_{RL}	Return Loss	-	8	15	-	dB
Delta Rx	Delta between Rx paths	A0 to R0g and A1 to R1g	-	-	0.5	dB
TR_{ISOL-2}	Rx Leakage	RX0ag or RX1ag = 0 TX0ag or TX1ag=1 Pu0g or Pu1g=1 Transmitting 15 dBm @ A0 or A1, Power measured at R0g or R1g	-15	-	-5	dBm
$ANTR_{ISOL}$	Isolation between A0 and R0g ports or A1 and R1g	Small signal input (from-15 dBm to 0 dBm) into A0 or A1, Device not transmitting, Power measured @ R0g or R1g, Rx0ag=Rx1ag=0 Tx0ag or TX1ag=1	20	-	30	dB
Rg_{coup}	Coupling between R0g and R1g	Small signal input to A0 or A1 and measured at R0g and R1g	40	-	-	dBc

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5 GHz AC Electrical Characteristics

5 GHz Transmit Characteristics (Channel 0, Channel 1)

Conditions: V_{CC} = 3.3 V, "PU0a and TX0ag" or "PU1a and TX1ag" = 3.3 V, PU0g = PU1g = RX0ag = RX1ag = 0 V, T_A = 25 °C, as measured on SiGe Semiconductor's SE2545A23-EV1 evaluation board (de-embedded to device), all unused ports terminated with 50 ohms, unless otherwise noted.

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
F_{IN}	Frequency Range	-	4900	-	5850	MHz
$P_{802.11a}$	Nominal Output Power	54 Mbps OFDM signal, 64 QAM, EVM = 3.0 %	-	15	-	dBm
BEVM	Backed Off EVM	54 Mbps, OFDM signal, 64 QAM, P = 7 dBm	-	1.5	-	%
P_{1dB}	P1dB	-	20	22.5	-	dBm
S_{21}	Small Signal Gain	-	23	-	32	dB
$\Delta S_{21}CH$	Small Signal Gain Variation Over 20 MHz Channel	-	-	-	0.5	dB
ΔS_{21}	Small Signal Gain Variation Over Band	-	-	2.5	4	dB
$S_{21}3.2$	Gain @ 3.2 to 3.9 GHz	-	-	2	7	dB
2f,3f	Harmonics	Pout = 15 dBm, 54 Mbps, 802.11a signal	-	-	-42	dBm/MHz
IM3	3rd Order Inter-modulation	f1 and f2 at Fc +/- 156.25 kHz, P = 15 dBm	-	-40	-	dBc
IM5	5th Order Inter-modulation	f1 and f2 at Fc +/- 156.25 kHz, P = 15 dBm	-	-55	-	dBc
t_r	Rise Time	10 % to 90% of final output power level	-	-	0.5	µs
t_{dr}, t_{df}	Delay and rise/fall Time	50 % of V_{EN} edge and 90/10 % of final output power level	-	-	0.5	µs
S_{11}	Input Return Loss	-	6	10	-	dB
Ta_{coup}	Coupling between T0a and T1a	Test Signal applied at T0a or T1a and measured at A0 or A1	20	-	-	dBc
STAB	Stability	P_{OUT} ≤ 18 dBm Load VSWR = 4:1	All non-harmonically related outputs less than -50 dBc/1MHz			

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5 GHz Receive Characteristics (Channel 0, Channel 1)

Conditions: V_{CC} = 3.3 V, RX0ag or RX1ag = 3.3 V, PU0g = PU1g = PU0a = PU1a = TX0ag = TX1ag = 0 V, T_A = 25 °C, as measured on SiGe Semiconductor's SE2545A23-EV1 evaluation board (de-embedded to device), all unused ports terminated with 50 ohms, unless otherwise noted.

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
F_{OUT}	Frequency Range	-	4900	-	5850	MHz
RX_{IL}	Insertion Loss	-	-	2.5	3.0	dB
RX_{RL}	Return Loss	-	8	15	-	dB
Delta Rx	Delta between Rx paths	A0 to R0a and A1 to R1a	-	-	1	dB
TR_{ISOL-2}	Rx Leakage	RX0ag or RX1ag = 0 TX0ag or TX1ag = 1 Pu0a or Pu1a = 1 Transmitting 15 dBm @ A0 or A1, Power measured at R0a or R1a	-12	-	-1	dBm
$ANTR_{ISOL}$	Isolation between A0 and R0a ports or A1 and R1a	Small signal input (from 15 dBm to 0 dBm) into A0 or A1, Device not transmitting, Power measured @ R0g or R1g, Rx0ag = Rx1ag = 0 Tx0ag or TX1ag = 1	16	-	29	dB
Ra_{coup}	Coupling between R0a and R1a	Small signal input to A0 or A1 and measured at R0a and R1a	40	-	-	dBc

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2.4 GHz Power Detector Characteristics

Conditions: V_{CC} = 3.3 V, "PU0g and TX0ag = 3.3 V or "PU1g and TX1ag = 3.3 V", RX0ag = RX1ag = 0 V, T_A = 25 °C, as measured on SiGe Semiconductor's SE2545A23-EV1 evaluation board (de-embedded to device), all unused ports terminated with 50 ohms, unless otherwise noted.

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
F_{OUT}	Frequency Range	-	2400	-	2500	MHz
PDR	Power detect range, peak power	Measured at A0 or A1	0	-	20	dBm
PDZ_{LOAD}	DC load impedance	-	-	2.7	-	kohm
PDV_{NoRF}	Output Voltage, P_{OUT} = No RF	-	0.90	0.95	1.00	V
PDV_{p15}	Output Voltage, P_{OUT} = 15dBm	-	0.55	-	0.78	V
PDV_{p18}	Output Voltage, P_{OUT} = 18dBm	-	0.41	-	0.64	V
LPF_{-3dB} (Note 2)	Power detect low pass filter -3dB corner frequency	Load = high impedance Min: 10 kohm Typ: 500 kohm	270	300	400	KHz

Note 2: The SE2545A23 provides the following load: PDZ_{LOAD} = 2.4 kohm, PDC_{LOAD} = 220 pF

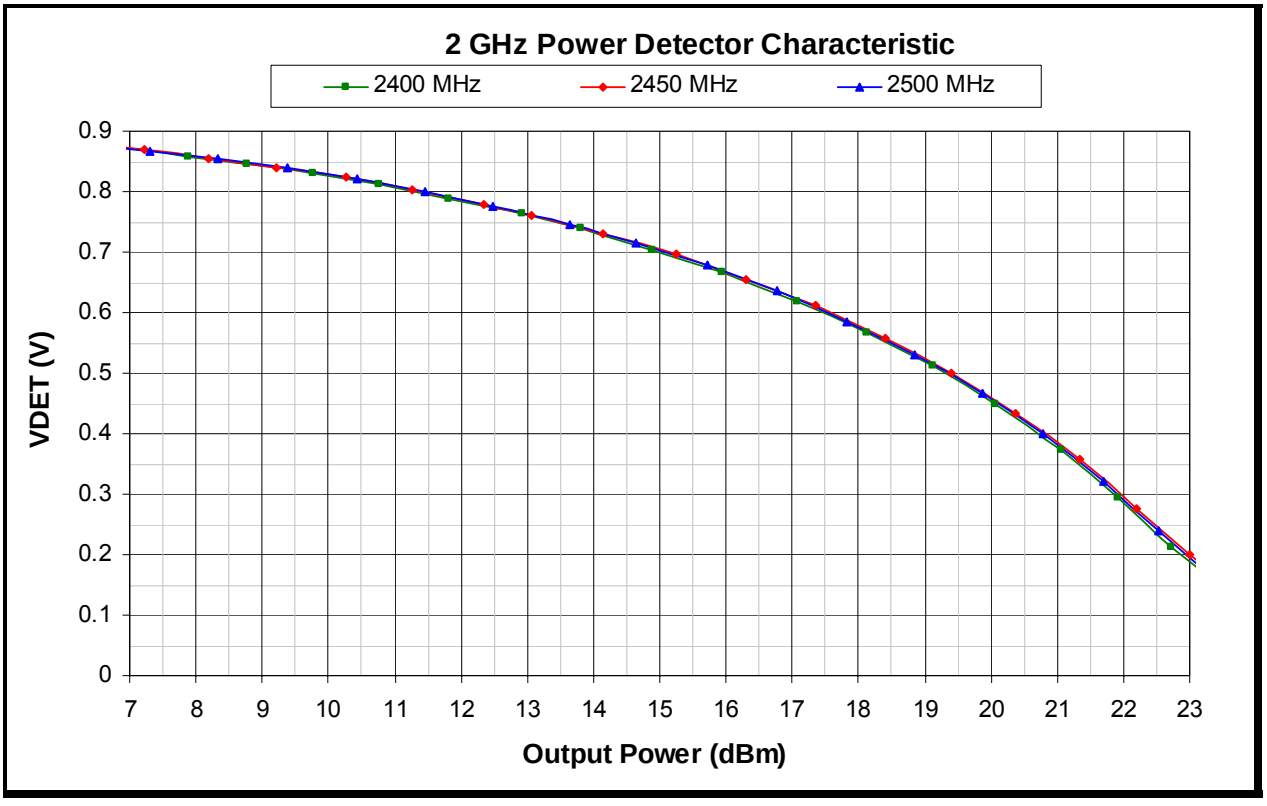

Figure 3: 2.4 GHz Power Detector Response over Frequency (CW Signal Used)

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5 GHz Power Detector Characteristic

Conditions: V_{CC} = 3.3 V, "PU0a and TX0ag" or "PU1a and TX1ag" = 3.3 V", RX0ag = RX1ag = 0 V, T_A = 25 °C, as measured on SiGe Semiconductor's SE2545A23-EV1 evaluation board (de-embedded to device), all unused ports terminated with 50 ohms, unless otherwise noted.

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
F_{OUT}	Frequency Range	-	4900	-	5850	MHz
PDR	Power detect range, peak power	Measured at A0 or A1	0	-	20	dBm
PDZ_{LOAD}	DC load impedance	-	-	2.7	-	kohm
PDV_{NoRF}	Output Voltage, P_{OUT} = No RF	-	0.90	0.95	1.00	V
PDV_{p15}	Output Voltage, P_{OUT} = 15dBm	-	0.54	-	0.75	V
PDV_{p18}	Output Voltage, P_{OUT} = 18dBm	-	0.35	-	0.55	V
LPF_{-3dB} (Note 2)	Power detect low pass filter -3dB corner frequency	Load = high impedance Min: 10 kohm Typ: 500 kohm	270	300	400	KHz

Note 2: The SE2545A23 provides the following load: PDZ_{LOAD} = 2.4 kohm, PDC_{LOAD} = 220 pF

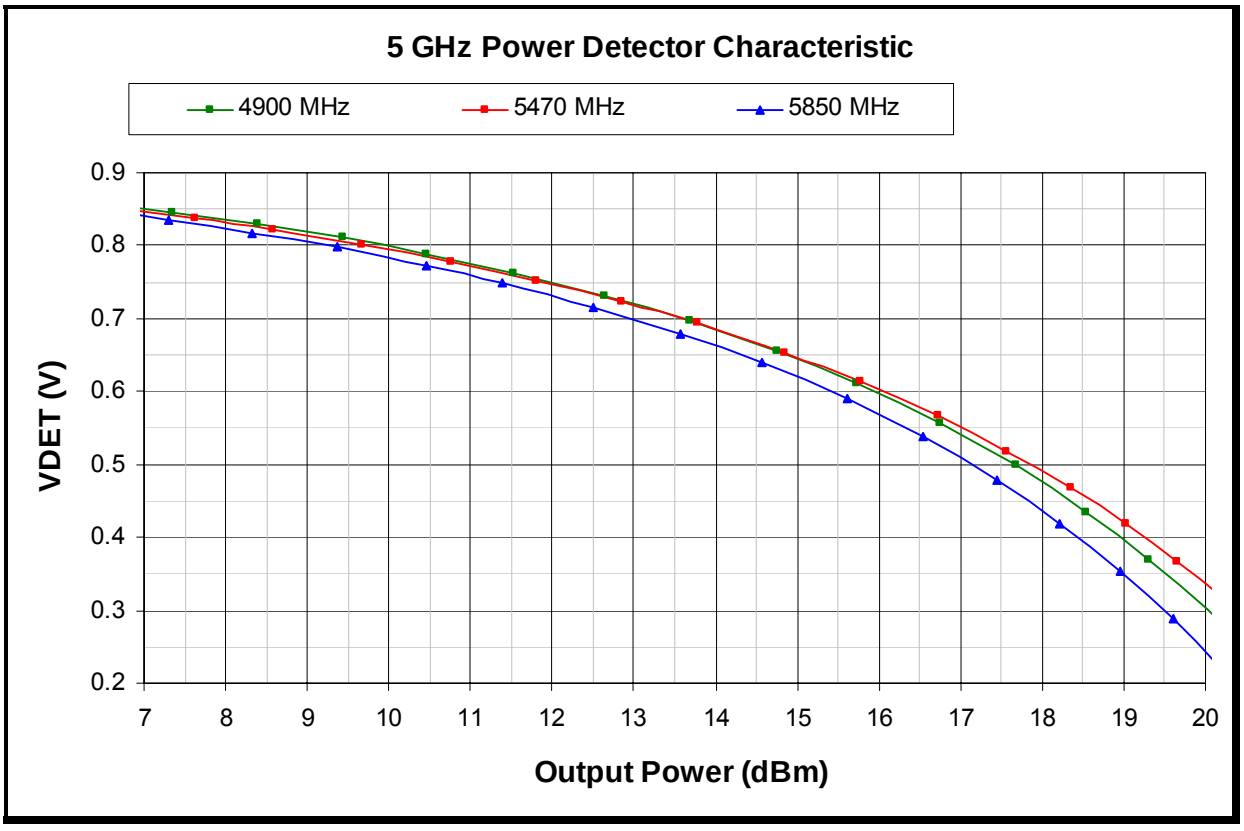

Figure 4: SE2545A23 5 GHz Power Detector Response over Frequency (CW Signal)

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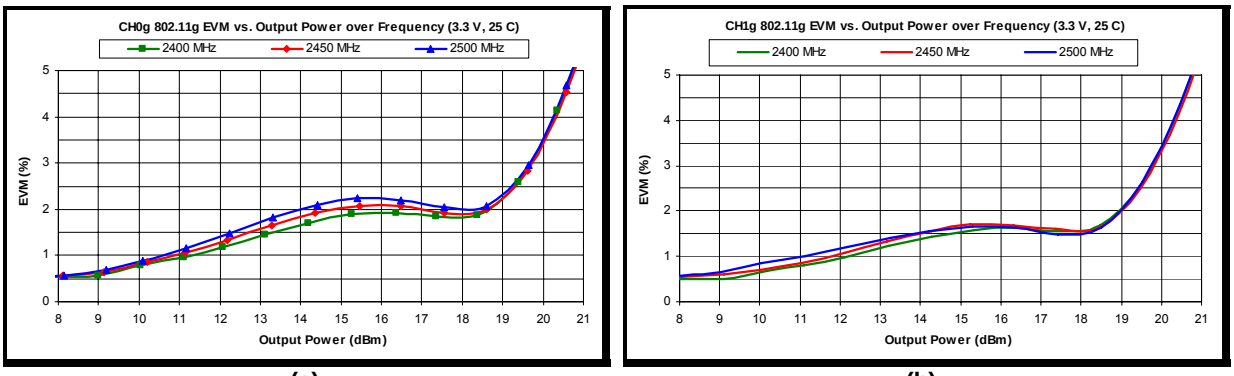
Typical Performance Data

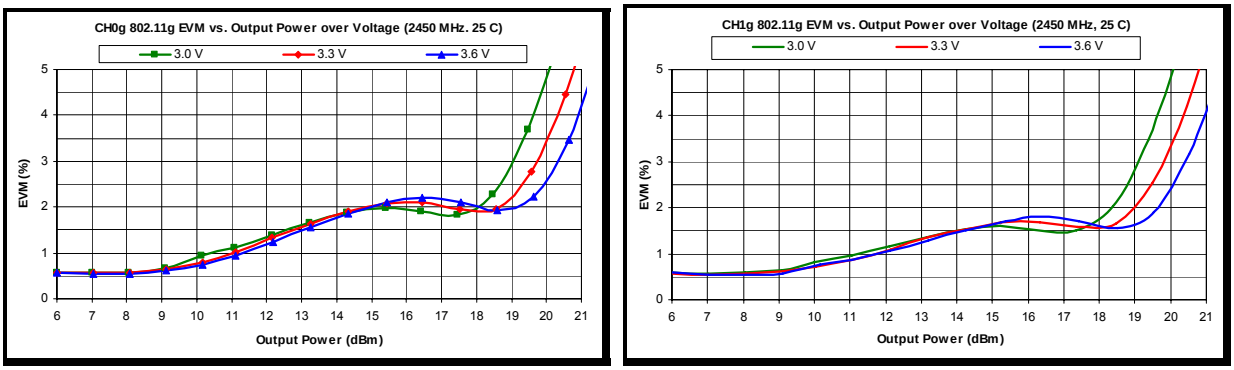
2.4 GHz Typical Performance

Conditions: V_{CC} = V_{EN} = 3.3 V, Frequency = 2450 MHz, T_A = 25 °C, as measured on SiGe Semiconductor's SE2545A23-EV1 evaluation board , all unused ports terminated with 50 ohms, unless otherwise noted.



(a) (b)

Figure 5: 802.11g, 54 Mbps EVM vs. Output Power over Frequency (a) Channel 0 (b) Channel 1



(a) (b)

Figure 6: 802.11g, 54 Mbps EVM vs. Output Power over Voltage (a) Channel 0 (b) Channel 1

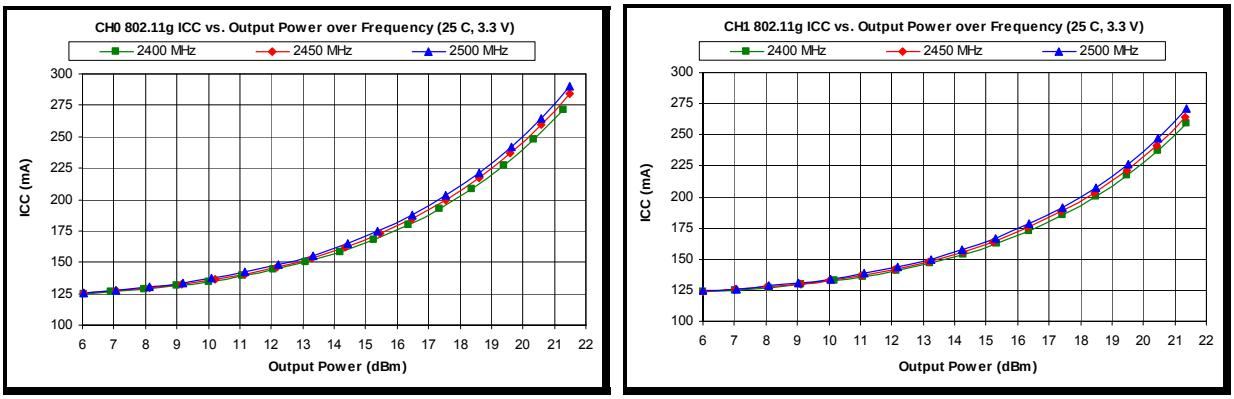


Figure 7: 802.11g, 54 Mbps ICC vs. Output Power over Frequency (a) Channel 0 (b) Channel 1

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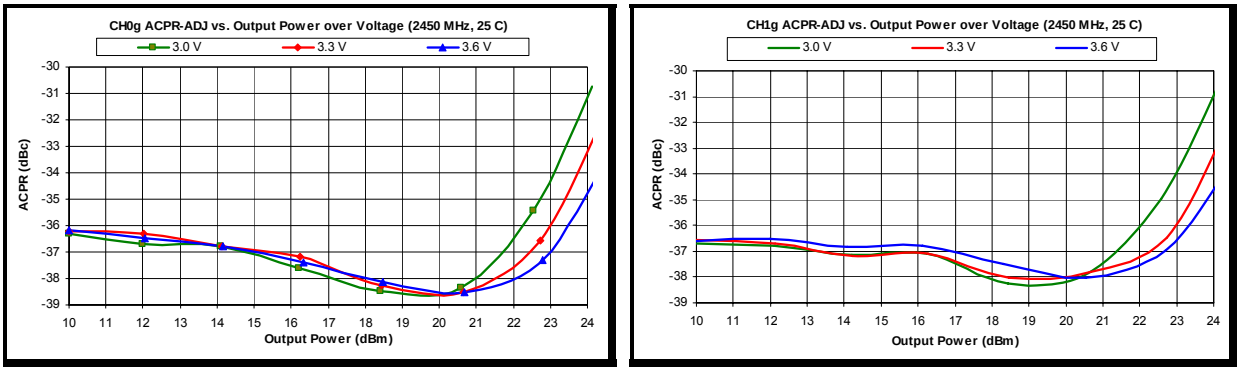
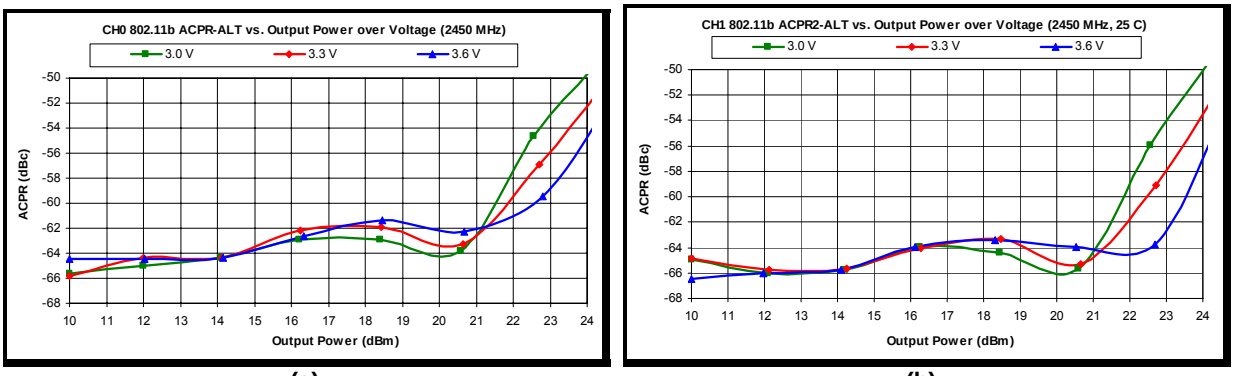


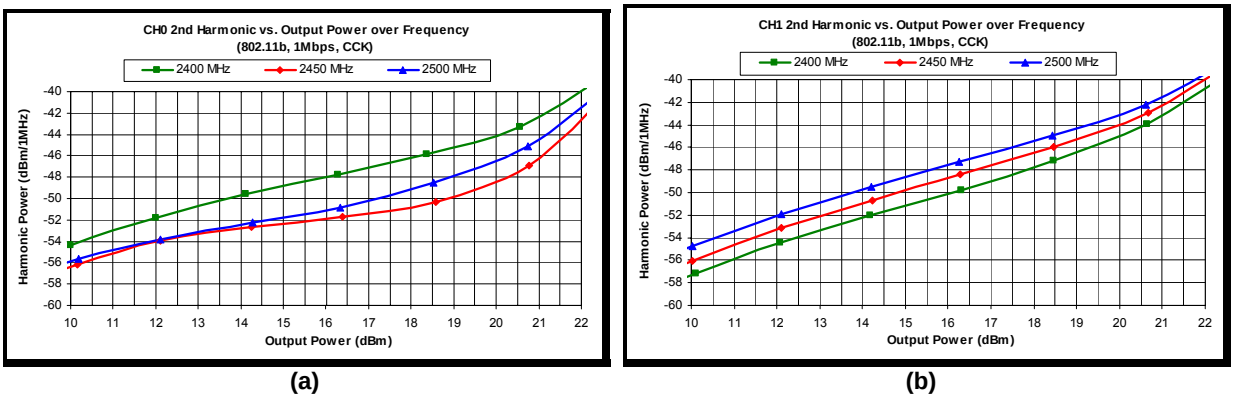
(a) (b)

Figure 8: 802.11b, 11 Mbps ACPR-Adjacent vs. Output Power over Voltage (a) Channel 0 (b) Channel 1



(a) (b)

Figure 9: 802.11b, 11 Mbps ACPR-Alternate vs. Output Power over Voltage (a) Channel 0 (b) Channel 1



(a) (b)

Figure 10: 2nd Harmonic vs. Output Power over Frequency (802.11b, 1Mbps, CCK) (a) Channel 0 (b) Channel 1

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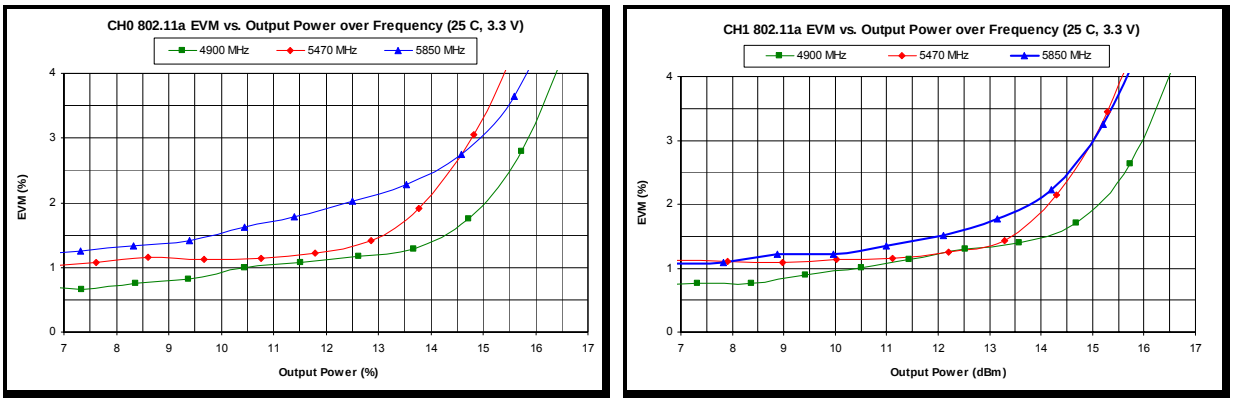
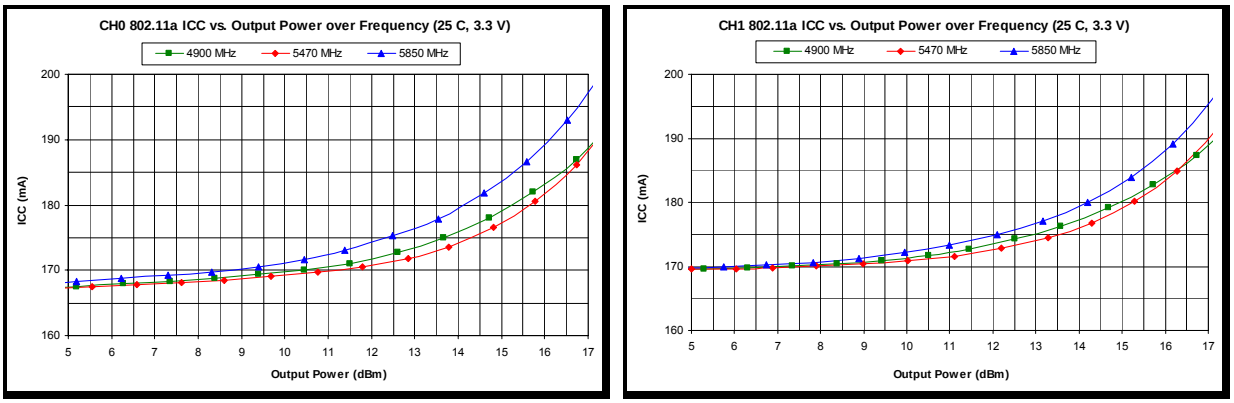
5 GHz Typical Performance

Conditions: V_{CC} = V_{EN} = 3.3 V, Frequency = 2450 MHz, T_A = 25 °C, as measured on SiGe Semiconductor's SE2545A23-EV1 evaluation board , all unused ports terminated with 50 ohms, unless otherwise noted.



(a) (b)

Figure 11: 802.11a EVM vs. Output Power over Frequency (a) Channel 0 (b) Channel 1



(a) (b)

Figure 12: 802.11a ICC vs. Output Power over Frequency (OFDM, 54 Mbps) (a) Channel 0 (b) Channel 1

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Package Information

Figure 13, Figure 14 and Figure 15 are the detailed device package diagrams. The pads on the SiGe RF modules are plated with gold over nickel, with a gold thickness of approx. 0.75 to 1.0 um. The modules can be reflowed onto FR4 based material using eutectic Pb based or common tin based Pb free solder pastes.

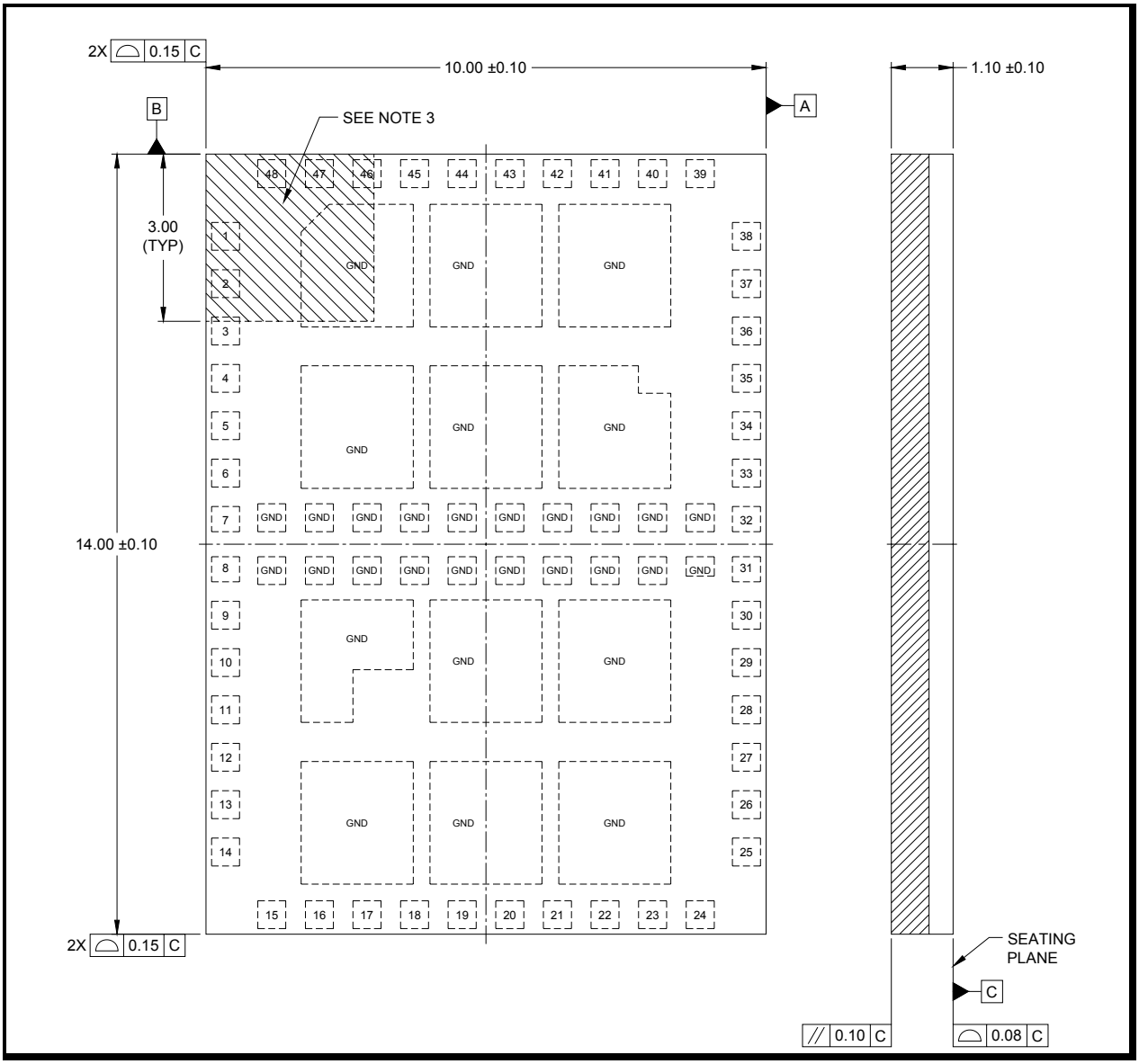

Figure 13: SE2545A23 Package Diagram (218-POD-01, Rev 2.0)

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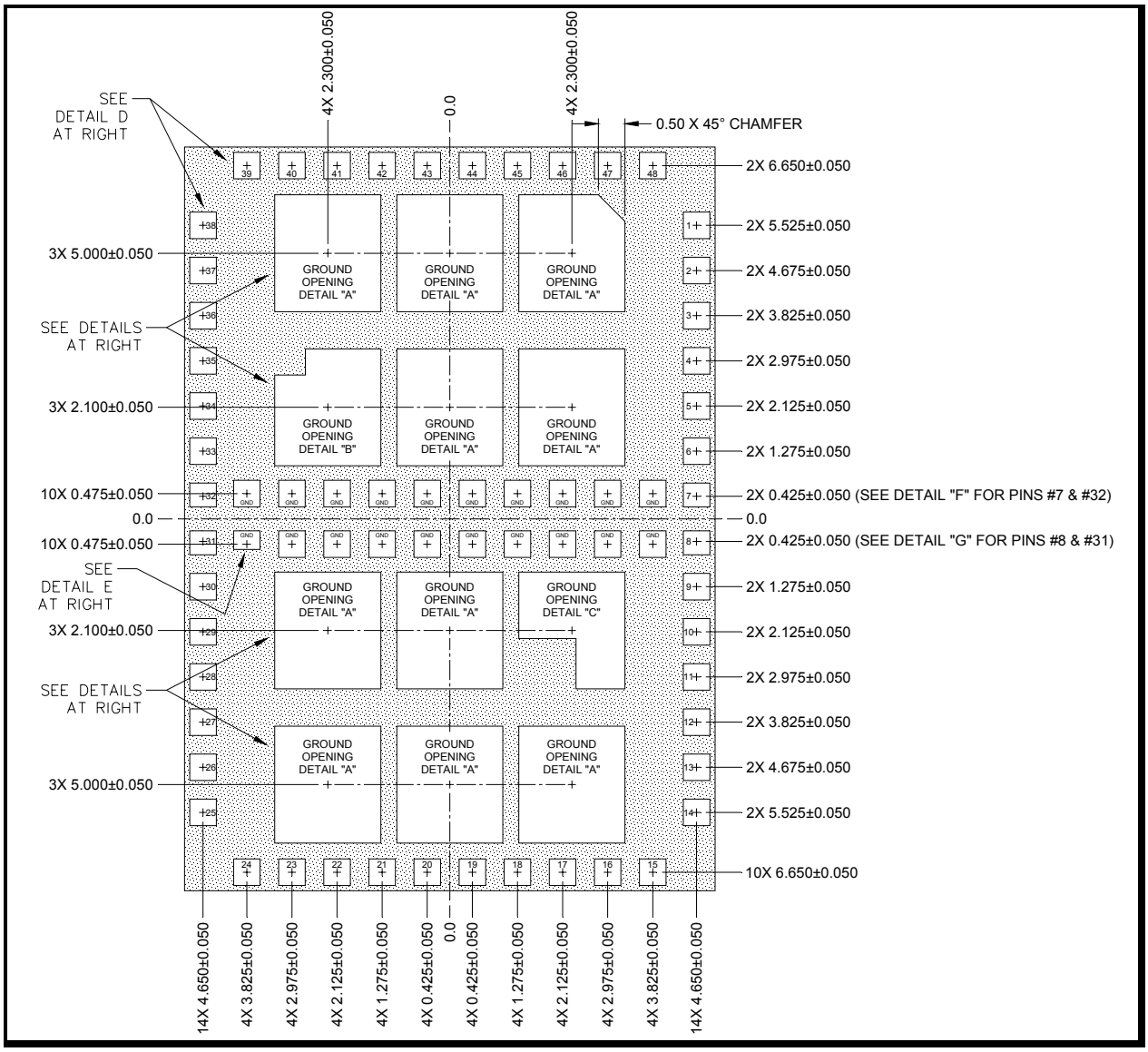

Figure 14: SE2545A23 Detailed Package Diagram (218-POD-01, Rev 2.0)

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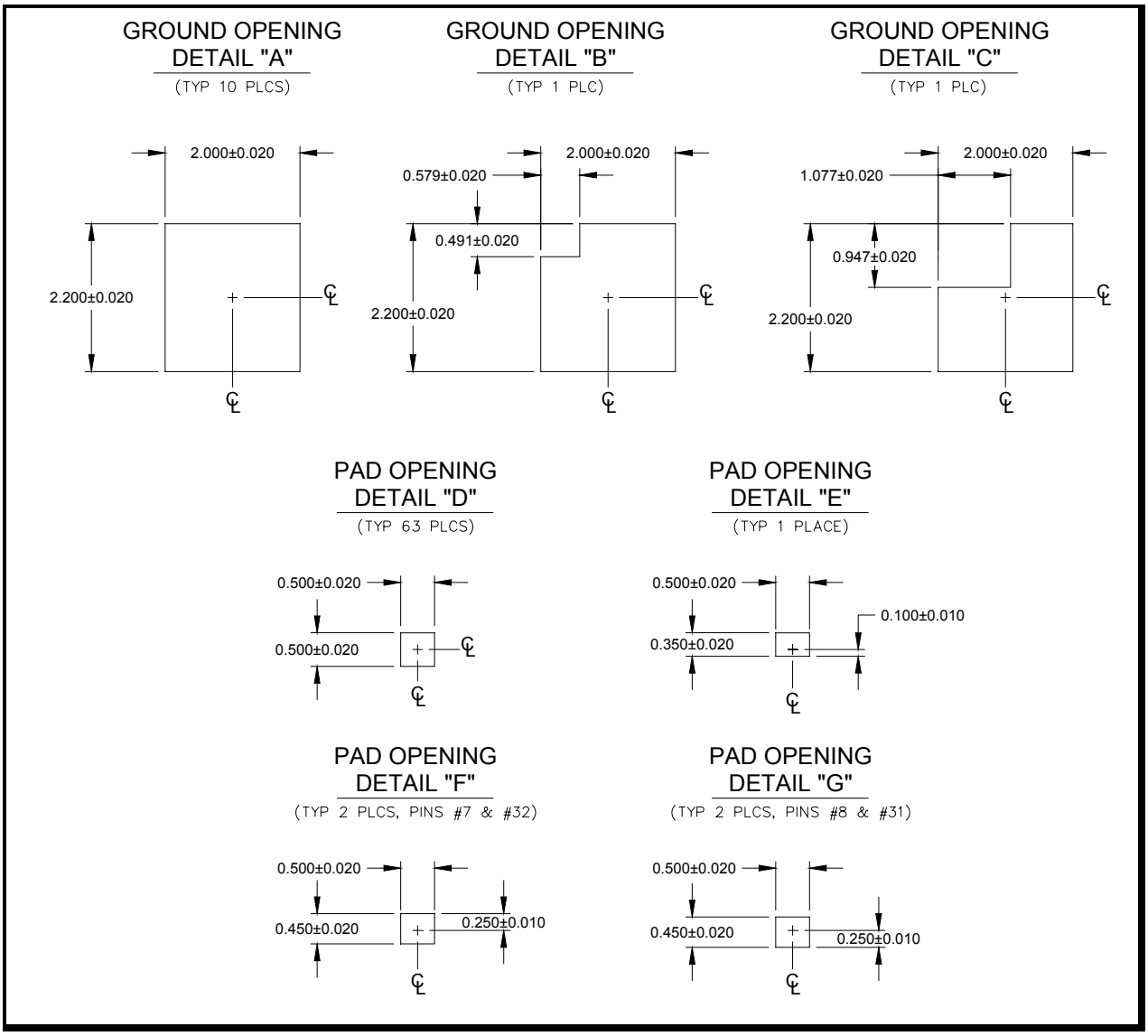

Figure 15: SE2545A23 Detailed Package Diagram (218-POD-01, Rev 2.0)

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Recommended PCB Footprint

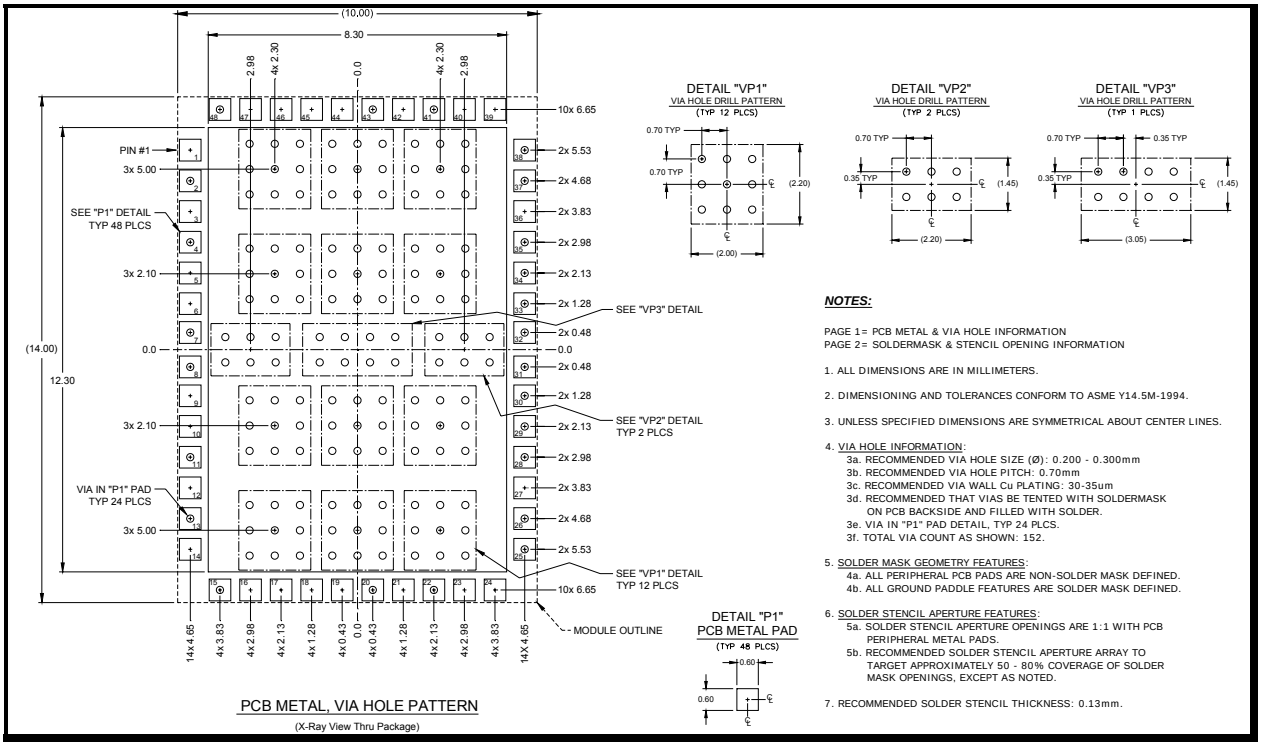

Figure 16: Recommended PCB Footprint – PCB Metal, Via Hole Pattern (173-DWG-10, Rev 1.0)

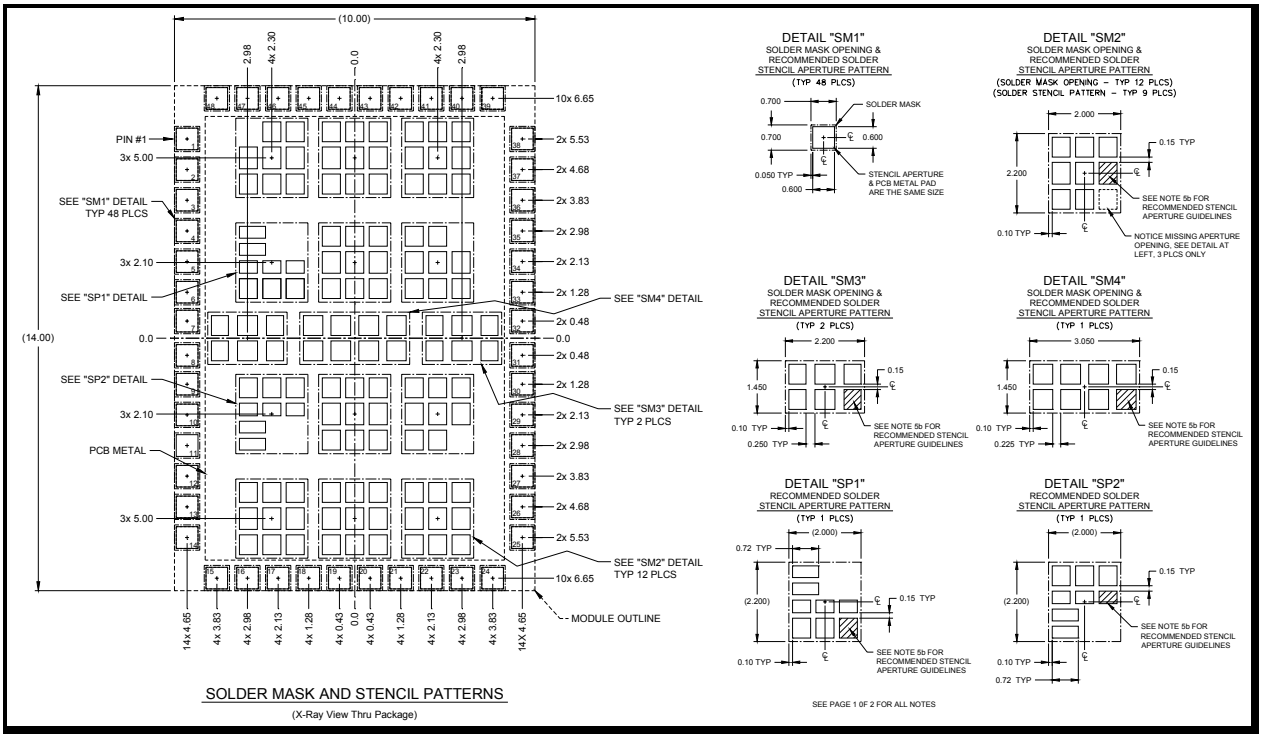

Figure 17: Recommended PCB Footprint – Solder Mask and Stencil Patterns (173-DWG-10, Rev 1.0)

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Package Handling Information

Because of its sensitivity to moisture absorption, instructions on the shipping container label must be followed regarding exposure to moisture after the container seal is broken, otherwise, problems related to moisture absorption may occur when the part is subjected to high temperature during solder assembly. The SE2545A23 is capable of withstanding a Pb free solder reflow. Care must be taken when attaching this product, whether it is done manually or in a production solder reflow environment. If the part is manually attached, precaution should be taken to insure that the device is not subjected to temperatures above its rated peak temperature for an extended period of time. For details on both attachment techniques, precautions, and handling procedures recommended by SiGe, please refer to:

- SiGe's Application Note: "Land Grid Array Module Solder Reflow & Rework Information", *Document Number 69-APP-01*.
- SiGe's Application Note: "Handling, Packing, Shipping and Use of Moisture Sensitive LGA", *Document Number 69-APP-02*.

Branding Information

The device branding is shown in Figure 18.

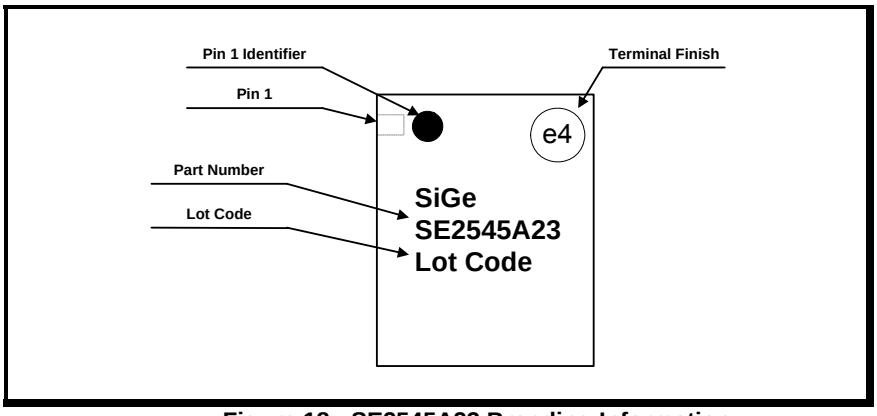

Figure 18: SE2545A23 Branding Information

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Tray Information

Tray Matrix (Devices)	Devices per Tray	Trays per stack	Devices per stack
9 x 17	153	10 + 1(empty)	1530

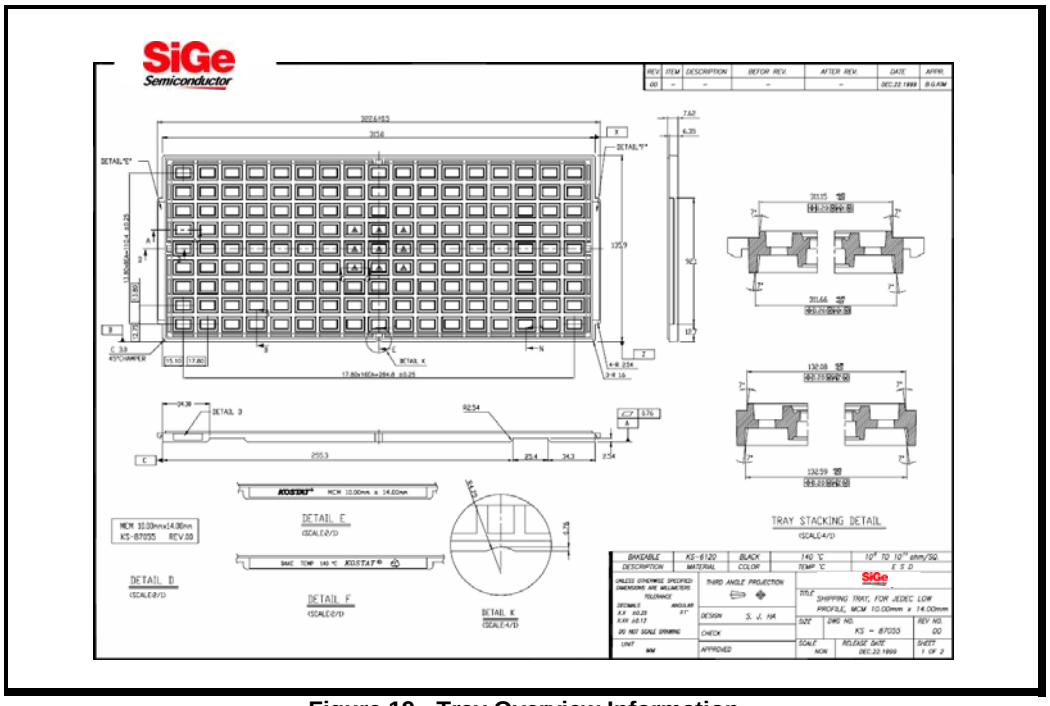

Figure 19: Tray Overview Information

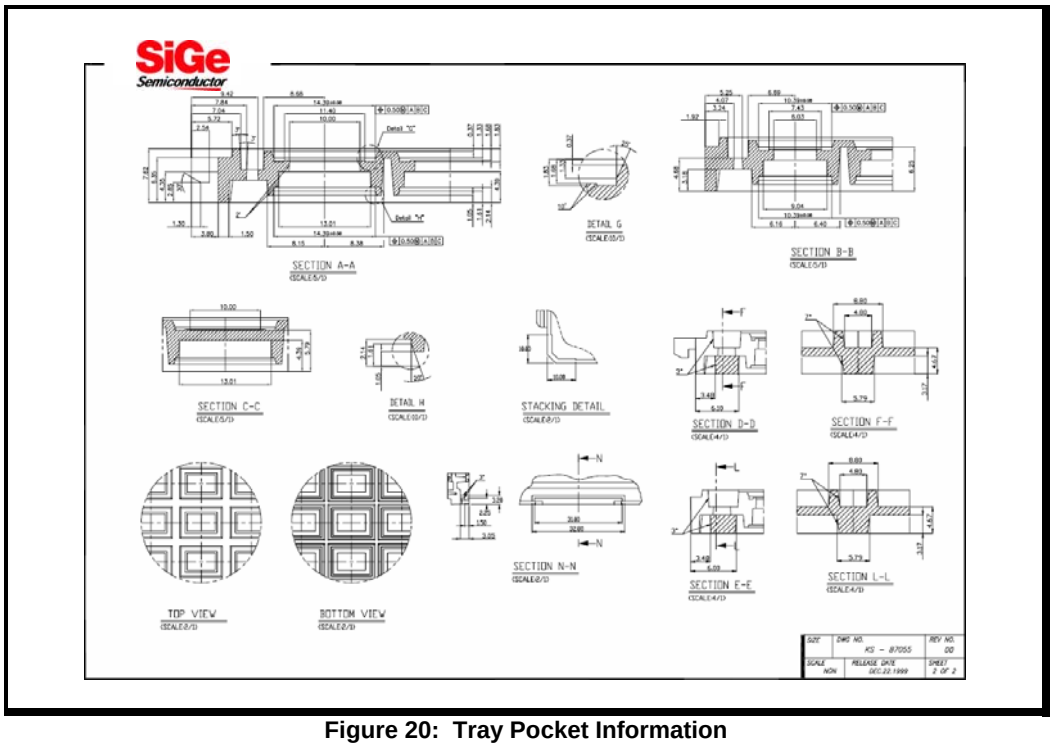

Figure 20: Tray Pocket Information

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Product Preview
The datasheet contains information from the product concept specification. SiGe Semiconductor, Inc. reserves the right to change information at any time without notification.

Preliminary Information
The datasheet contains information from the design target specification. SiGe Semiconductor, Inc. reserves the right to change information at any time without notification.

Production testing may not include testing of all parameters.

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