Part Number: IB2856S30

Integra
TECHNOLOGIES, INC.

Pulsed Medical Transistor

The high power pulsed transistor part number IB2856S30 is designed to operate in class C mode. This common base device supplies a minimum of 30 watts of peak pulse power under the conditions of 12μs pulse width and 3% duty cycle. All devices are 100% screened for large signal RF parameters. Excellent spectral stability into output mismatch over a broad input power range make it ideal for use in reliable high power solid state amplifiers. Designed to be used as a driver device for IB2856S250 or as a stand-alone device. This device is rated for a peak output power level of P_{PEAK} = 30W @ 3% duty factor. This corresponds to an average power P_{AVG} = 0.9W.

Silicon Bipolar
- Ultra-high f_T

Class C Operation
- High Efficiency

Common Base Configuration
- Single Power Supply

Gold Metal
- Maximum Reliability

Emitter Ballasting
- Optimum Thermal Distribution

Internal Impedance Matching
- Ease of Use
- Ultra-low Loss Design

Be0 Package
- Unmatched Thermal Reliability

RF Test Fixture
- Matched to 50Ω
- Long-term Correlation
- 100% Device RF Screening
- No External Tuning Allowed
- Micro-strip structure on soft pc board with dielectric constant 10.5

TYPICAL DATA *TYPICAL DATA* *TYPICAL DATA* *TYPICAL DATA*

Device	Freq (MHz)	V_{CC} (V)	P_{IN} (W)	IRL (dB)	P_{OUT} (W)	G_P (dB)	I_C (A)	N_C (%)	Droop (dB)
D3111-8	2856	40	4.0	-17	39	9.89	1.93	50	0.0

Power measurements made using Boonton 4500 Peak Power Analyzer

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

MAXIMUM RATINGS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
BD	Collector-Emitter Voltage	V_{CES}			V	--
BD	Emitter-Base Voltage	V_{EBO}			V	--
BD	Storage Temperature Range	T_{STG}			°C	--
BD	Operating Junction Temperature Range	T_J			°C	--
BD	CW Operation	--	--	--	--	Not rated for CW operation.
Note	Screen 'BD' = parameter qualified By Design.					

THERMAL CHARACTERISTICS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
BD	Thermal Resistance	$R_{TH(JC)}$		0.4	°C/W	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{OUT}=30W, F=F1.
Note	Screen 'BD' = parameter qualified By Design.					

PROCESSING SPECIFICATIONS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	DC Wafer Probe	--	--	--	--	Per Integra specification.
Q1	Wafer DC and RF Qualification	--	--	--	--	Per Integra specification.
LM	Wire Bond Strength	--	--	--	--	Line monitor per Integra specification.
100%	Pre-cap visual inspection	--	--	--	--	Per Integra specification
100%	Gross leak test	--	--	--	--	MIL-STD-750D, Method 1071, Test Condition C
Note	Screen 'Q1' = parameter is qualified by assembly and test of 3 pieces minimum per wafer.					
Note	Screen 'LM' = parameter is qualified by assembly line monitor.					

DC ELECTRICAL CHARACTERISTICS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Collector-Emitter Breakdown Voltage	BV_{CES}	70	--	V	I_C=10mA, V_{BE}=0V, T_F=25±5°C.
100%	Zero Base Voltage Collector Leakage Current	I_{CES}	--	1.5	mA	V_{CE}=30V, V_{BE}=0V, T_F=25±5°C.
100%	DC Current Gain	H_{FE}	10	150	--	V_{CE}=5V, I_C=0.1A, T_F=25±5°C.

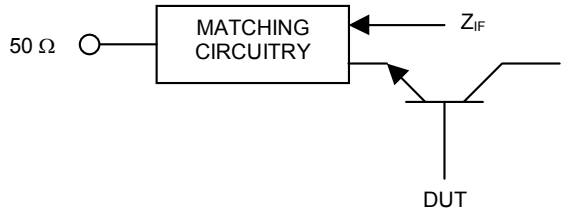
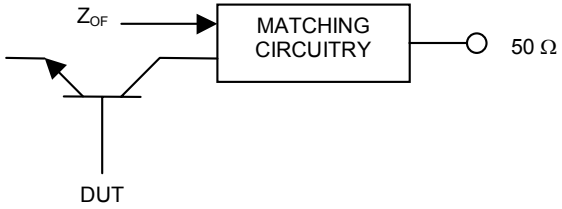
www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

RF ELECTRICAL CHARACTERISTICS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Input Return Loss	IRL	10	--	dB	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{IN}=P_{IN1}, F=F1.
100%	Maximum Overdrive	$P_{IN(MAX)}$				
100%	Power Gain	G				
100%	Output Power	P_{OUT}	30	--	W	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{IN}=P_{IN1}, F=F1.
100%	Collector Efficiency ($P_O/I_C/V_{CC}$)	N_C	42	--	%	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{IN}=P_{IN1}, F=F1.
100%	Pulse Amplitude Droop	D	--	0.3	dB	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{IN}=P_{IN1}, F=F1.
100%	Stability into 1.5:1 VSWR	VSWR-S	--	--	--	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{IN}=P_{IN1}, F=F1. Rotate 1.5:1 output VSWR through 360° phase. No oscillatory or pulse break-up characteristics allowed on detected output pulse. All non-harmonically related signals must be at least –65 dBc.
100%	Load Mismatch Tolerance	LMT	--	--	--	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{IN}=P_{IN1}, F=F1. Rotate 3:1 output VSWR through 360° phase. Post-test P_{OUT} = Pre-test P_{OUT}±1W.
BD	Pulse Risetime	RT	--	100	ns	V_{CC}=V1, PW=PW1, DF=DF1, T_F=25±5°C, P_{IN}=P_{IN1}, F=F1. Measure between 10% and 90% detected power points.
Note 1	V1=40V; PW1=12µs; DF1=3%; F1 = 2.856 GHz, P_{IN1}=4.0W.					
Note 2	T_F = Device flange temperature.					
Note 3	Screen 'BD' = parameter qualified By Design.					

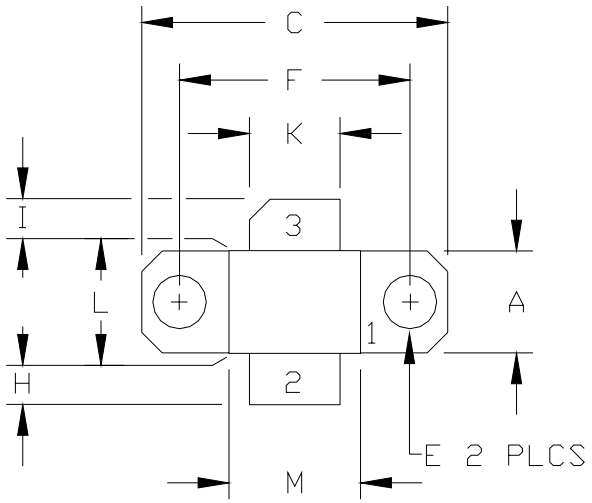
RF TEST FIXTURE IMPEDANCE CHARACTERISTICS

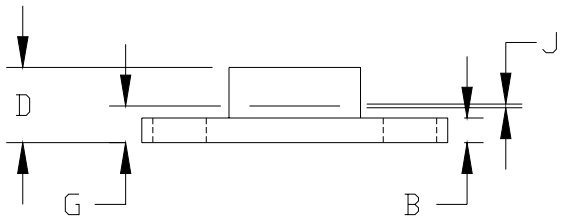
Frequency (MHz)	Z_{IF} (Ω)	Z_{OF} (Ω)
2.856	7.1 + j0.4	9.1 – j5.4
Impedance Definition		

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

PACKAGE DIMENSIONAL OUTLINE DRAWING





DIM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	0.243	0.253	6.17	6.43
B	0.055	0.065	1.40	1.65
C	0.739	0.749	18.77	19.02
D	0.165	0.185	4.19	4.70
E	0.125	0.135	3.18	3.43
F	0.555	0.565	14.10	14.35
G	0.082	0.092	2.08	2.34
H	0.070	0.125	1.78	3.18
I	0.070	0.125	1.78	3.18
J	0.004	0.006	0.10	0.15
K	0.215	0.225	5.46	5.72
L	0.245	0.255	6.22	6.48
M	0.315	0.325	8.00	8.26

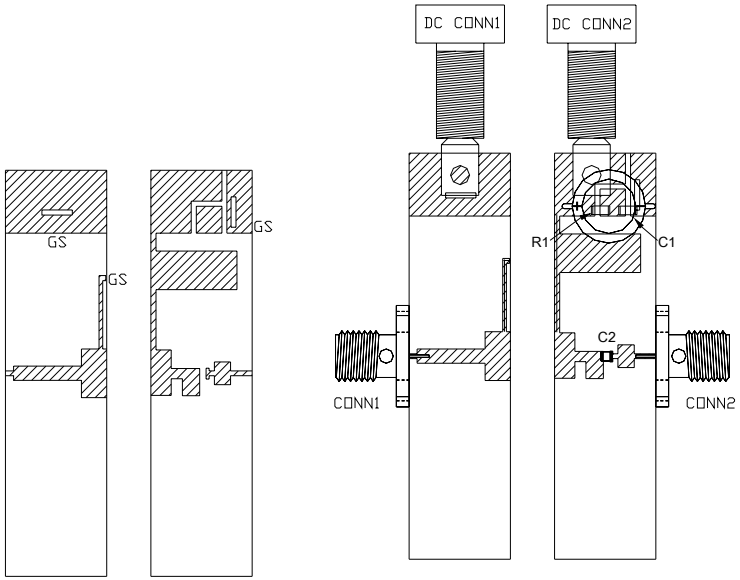
PIN SCHEDULE	
1	BASE
2	EMITTER
3	COLLECTOR

DOCUMENT NUMBER: IB2856S30	REV: NC
SHEET NAME: 06-OUTLINE	REV: NC

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

RF TEST FIXTURE



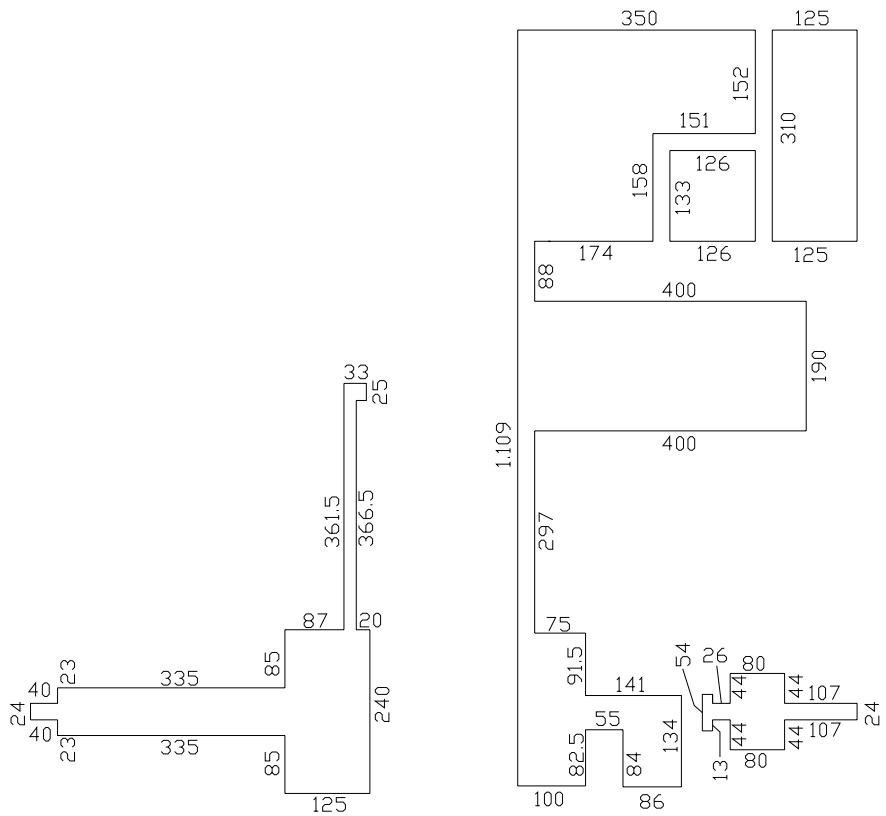
COMPONENT	DESCRIPTION
DUT	TRANSISTOR IB2856S30, MOUNT HARD TO THE RIGHT
PC BOARD	ROGERS 6010.2LM 0.025" 1E/1E
INPUT PC BOARD CARRIER	2 INCH BRASS -01 (0.50")
OUTPUT PC BOARD CARRIER	2 INCH BRASS -01 (0.50")
TRANSISTOR CARRIER	2 INCH COPPER -01
TRANSISTOR CLAMP	NORYL CLAMP -01
HEATSINK	2 INCH HEATSINK -09
CONN1, CONN2	SMA CONNECTOR, TYPE OS #2052-5636-02
C1	SNUB CAPACITOR .1uF
C2	CHIP CAPACITOR, TYPE ATC100A, 39pF
C3	ELECTROLYTIC CAPACITOR, 68uF / 63V
C4 - NOT SHOWN	ELECTROLYTIC CAPACITOR, 4700uF / 50V
R1	SNUB RESISTOR 6.81 OHM
DC CONN1	BANANA JACK, BLACK
DC CONN2	BANANA JACK, RED
GS	GROUND SHIM, COPPER, TH=0.001"
BLW	BIAS LINE WIRE -COPPER- 0.022" DIA TYPICAL
NOTE	FIXTURE HARDWARE DRAWINGS AVAILABLE ON REQUEST

ASSEMBLY AND PARTS LIST

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

RF TEST FIXTURE

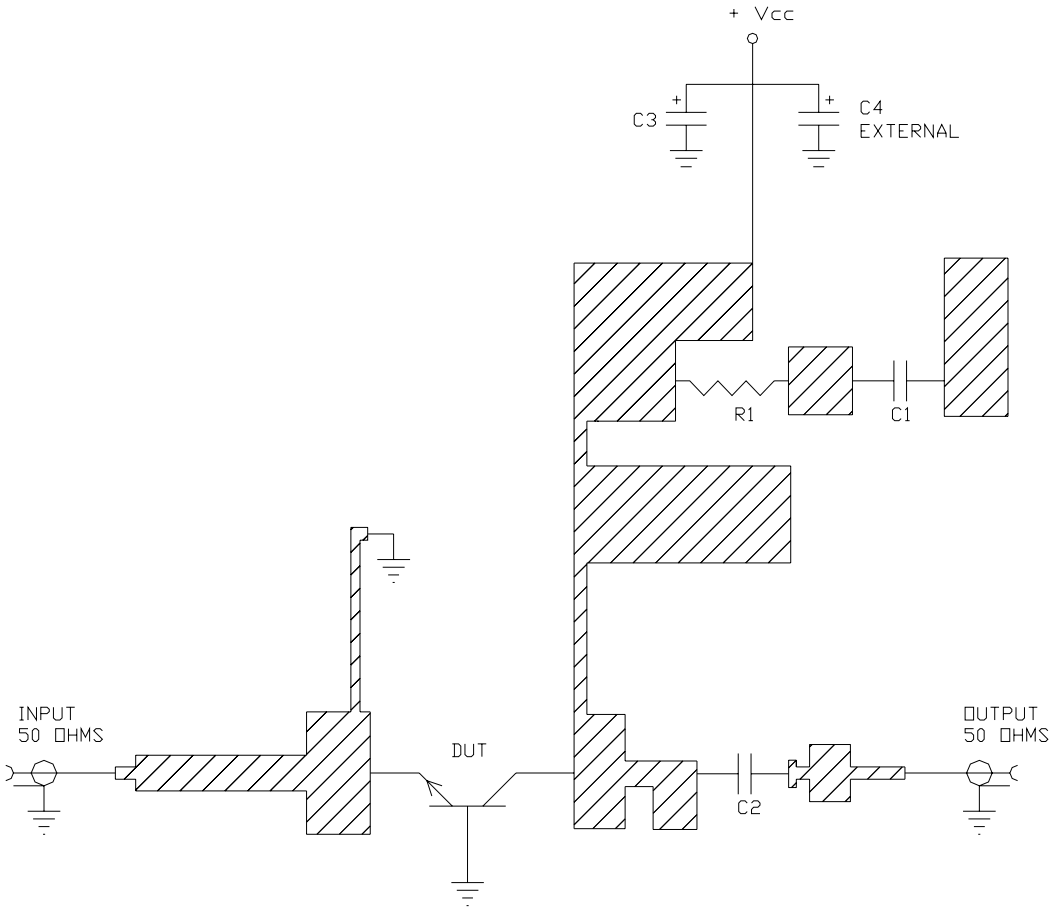


CIRCUIT DIMENSIONS

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

RF TEST FIXTURE



ELECTRICAL SCHEMATIC

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620

DEFINITIONS

Data Sheet Status	
Proposed Specification	This data sheet contains proposed specifications.
Preliminary Specification	This data sheet contains specifications based on preliminary measurements and data.
Product Specification	This data sheet contains final product specifications.

Maximum Ratings
Stress above one or more of the maximum ratings may cause permanent damage to the device. These are maximum ratings only. Operation of the device at these or at any other conditions above those given in the characteristics sections of the specification is not implied. Exposure to maximum values for extended periods of time may affect device reliability.

WARNING

Product and environmental safety - toxic materials
This product contains beryllium oxide. The product is entirely safe provided that the BeO base is not damaged. All persons who handle, use or dispose of this product should be aware of its nature and of the necessary safety precautions. After use, dispose of as chemical or special waste according to the regulations applying at the location of the user. It must never be thrown out with general or domestic waste.

DISCLAIMER

Integra Technologies Inc. reserves the right to make changes without further notice to any products herein. Integra Technologies Inc. makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Integra Technologies Inc. assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. Integra Technologies Inc. products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Integra Technologies Inc. customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Integra Technologies Inc. for any damages resulting from such improper use or sale.

www.integratech.com
PHONE: 310-606-0855
FAX: 310-606-0865

INTEGRA TECHNOLOGIES, INC.
321 CORAL CIRCLE
EL SEGUNDO, CA 90245-4620