

Broadband RF Power MOSFET

The high power transistor part number IDM30512CW20 is designed for VHF/UHF-Band systems operating over the frequency band 30-512 MHz under CW conditions. Over the instantaneous operating band of 30-512MHz this dual MOSFET device is capable of supplying a minimum of 20 watts of output power. All devices are 100% screened in a narrowband RF test fixture to supply a minimum of 70W of output power at 500MHz.



Silicon MOSFET

- High Power Gain
- Superior thermal stability

Class AB Operation

- Gate biased to $I_{DQ}=2 \times 50\text{mA}$

Configuration

- Common Source

Gold Metal

- Maximum Reliability

BeO Package

- Unmatched Thermal Reliability

Epoxy Sealed Lid

- Gross Leak Qualified

RF Test Fixture

- Narrowband
- Matched to 50Ω
- Long-term Correlation
- 100% Device RF Screening
- No External Tuning required

MAXIMUM RATINGS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
BD	Drain-Source Voltage	V_{DS}	--	80	V	--
BD	Gate-Source Voltage	V_{GS}	--	20	V	--
BD	Storage Temperature Range	T_{STG}	-55	+150	°C	--
BD	Operating Junction Temperature Range	T_J	-55	+200	°C	--
Note	Screen 'BD' = parameter qualified By Design.					

THERMAL CHARACTERISTICS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
BD	Thermal Resistance	$R_{TH(JC)}$	--	1.0	°C/W	$V_{CC}=28V$, $I_{DQ}=2x50mA$, $T_F=25\pm5^\circ C$, $P_{OUT}=20W$
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.					

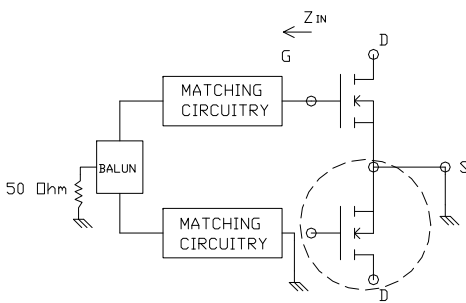
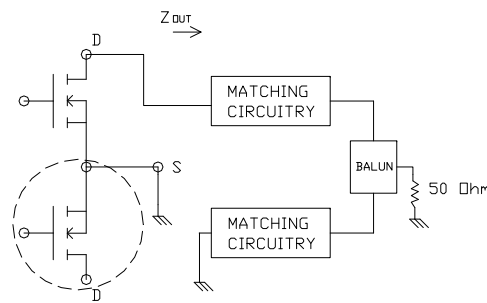
DC ELECTRICAL CHARACTERISTICS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Drain-Source Breakdown Voltage	BV_{DSS}	70	--	V	$I_D = 10mA$, $V_{GS} = 0V$, $T_F = 25\pm5^\circ C$
100%	Drain Leakage Current (each side)	I_{DSS}	--	2	mA	$V_{DS} = 30V$, $V_{GS} = 0V$, $T_F = 25\pm5^\circ C$
100%	Gate Threshold Voltage 2 (each side)	V_{GSTH2}	1.0	--	V	$I_D = 10mA$, $V_{GS} = 5V$, $T_F = 25\pm5^\circ C$

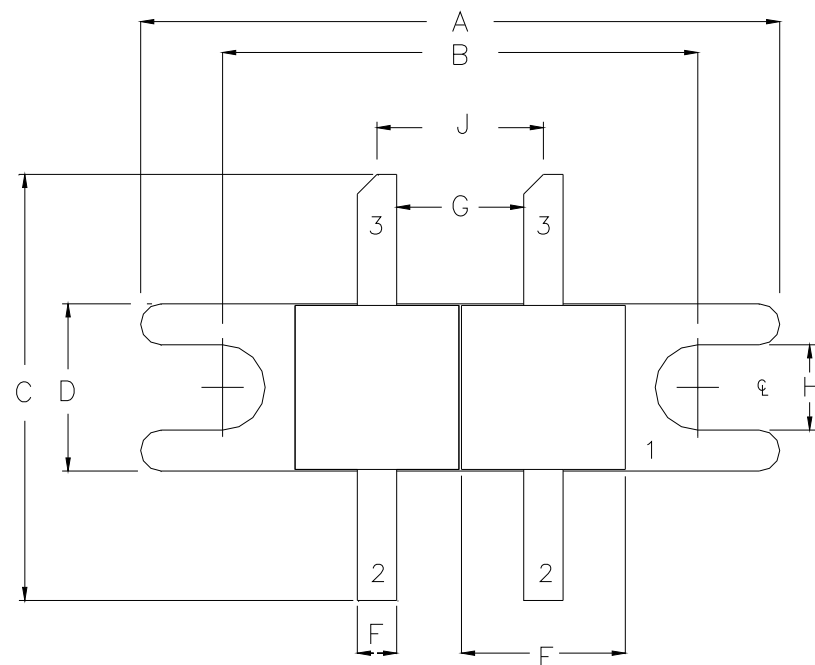
RF ELECTRICAL CHARACTERISTICS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Input Return Loss	IRL	10		dB	$V_{DD}=28V$, $I_{DQ}=2 \times 50mA$, $T_F=25 \pm 5^\circ C$, $P_{IN}=7W$, $F=500MHz$
100%	Output Power	P_O	70		W	$V_{DD}=28V$, $I_{DQ}=2 \times 50mA$, $T_F=25 \pm 5^\circ C$, $P_{IN}=7W$, $F=500MHz$
100%	Drain Efficiency ($P_O/I_D/V_{DD}$)	N_D	50		%	$V_{DD}=28V$, $I_{DQ}=2 \times 50mA$, $T_F=25 \pm 5^\circ C$, $P_{IN}=7W$, $F=500MHz$
BD	Input Capacitance	C_{ISS}		80	pF	$V_{DD}=28V$, $V_{GS}=0V$, $F=1MHz$
BD	Output Capacitance	C_{OSS}		40	pF	$V_{DD}=28V$, $V_{GS}=0V$, $F=1MHz$
BD	Reverse Transfer Capacitance	C_{RSS}		5	pF	$V_{DD}=28V$, $V_{GS}=0V$, $F=1MHz$
Note 2	T_F = Device flange temperature.					

RF TEST FIXTURE IMPEDANCE CHARACTERISTICS

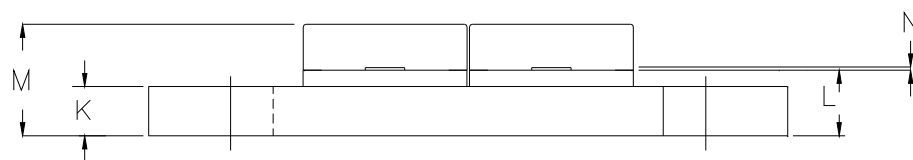
Frequency (MHz)	$Z_{IF} (\Omega)$	$Z_{OF} (\Omega)$
25	--	--
50	--	--
100	--	--
200	--	--
300	--	--
400	--	--
500	--	--
Impedance Definition		

Note : Input and output impedances are measured from gate to gate and drain to drain respectively.

PACKAGE DIMENSIONAL OUTLINE DRAWING


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.970	0.980	24.64	24.89
B	0.720	0.730	18.29	18.54
C	0.630	0.670	16.00	17.01
D	0.250	0.260	6.35	6.60
E	0.245	0.255	6.22	6.48
F	0.055	0.065	1.40	1.65
G	0.189	0.199	4.80	5.05
H	0.125	0.135	3.17	3.43
J	0.249	0.259	6.32	6.58
K	0.055	0.065	1.38	1.65
L	0.080	0.090	2.03	2.29
M	0.165	0.175	4.19	4.44
N	0.003	0.006	0.08	0.15

PIN SCHEDULE	
1	SOURCE
2	GATE
3	DRAIN



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.

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