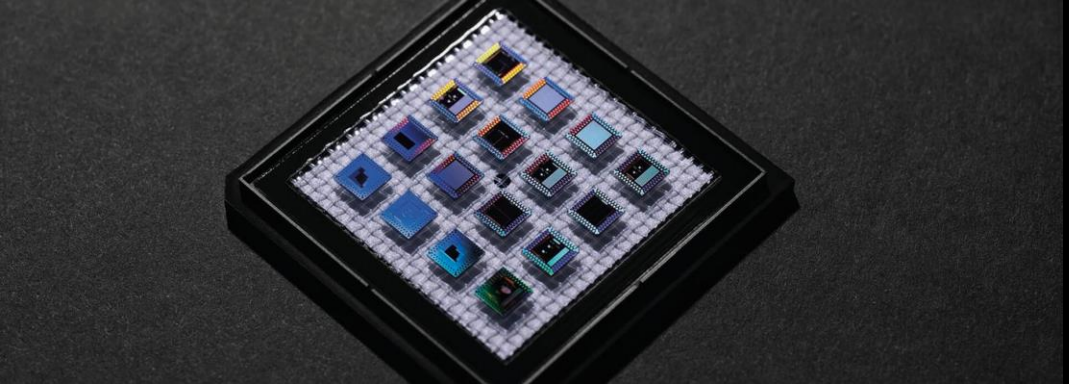


Die on Tab

Die on Heat Spreader Product Datasheet

PRODUCT DESCRIPTION

Northrop Grumman offers multiple options to purchase individual integrated circuits: bare die, bare die mounted on a heat spreader and bare die mounted on a heat spreader with bypass capacitors. Mounting bare die on a heat spreader may offer superior thermal performance as compared to bare die alone and adding capacitors ensure bypassing is performed close to the circuit. Additional details can be found in individual chip datasheets.

Heat Spreader Material

CuMoCu-based Tab

CuMo-based Tab

CuW-based Tab

Tab Thickness = 254 µm (0.010")

Attachment Method

AuSn Eutectic Solder layer

Eutectic Thickness = 25 µm (0.001")

Capacitor Options

100pF, 100V Bar Capacitors

X = 2388 µm (0.094")

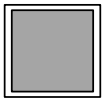
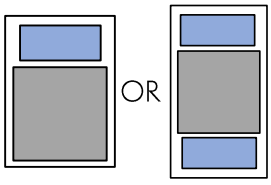
Y = 762 µm (0.030")

DC Gold Bond Pad = 381 x 660 µm (0.015" x 0.026")

Cap Thickness = 127 µm (0.005")

Cap Part Number = CRM-BN-94X30X5-G-101-Z-CE396 (or equivalent)

PRODUCT OPTIONS

OPTION	FIGURE	NAMING CONVENTION
BARE DIE		APNxxx
BARE DIE + TAB		APNxxxTAB
BARE DIE + TAB + CAPACITORS		APNxxxTABC

www.ngc.com

www.ngc.com/what-we-do/microelectronics-space-park/

Phone: (310) 814-5000 • Fax: (310) 812-7011 • E-mail: as-mps.sales@ngc.com

NORTHROP GRUMMAN

Die on Tab
Die on Heat Spreader
Product Datasheet

GENERAL CHIP DIAGRAM FOR DIMENSIONING

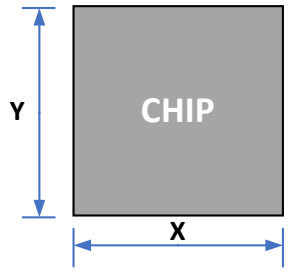


Figure 1A

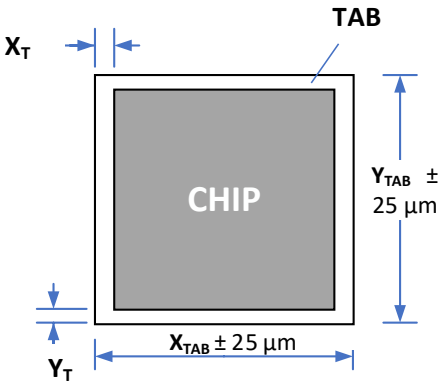


Figure 1B

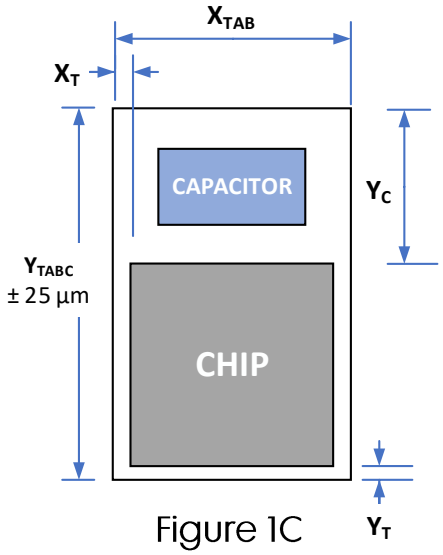


Figure 1C

SCHEMATIC LEGEND

Parameter	Value	Tolerance
Chip Width (X)	See Die Size Page	See Die Size Page
Chip Length (Y)	See Die Size Page	See Die Size Page
Tab-Chip Width Offset (X_T)	38 µm (0.0015″)	-
Tab-Chip Length Offset (Y_T)	38 µm (0.0015″)	-
TAB Width (X_{TAB})	$X_{TAB} = X + 76$ µm	± 25 µm
TAB Length (Y_{TAB})	$Y_{TAB} = Y + 76$ µm	± 25 µm
TAB Length (Y_{TABC})	$Y_{TABC} = Y + Y_C + Y_T$	± 25 µm
Chip Edge to TAB Edge Length (Y_C)	1170 µm (0.046″)	-

NOTES

Figure 1A: Chip

Figure 1B: Chip + Heat Spreader (TAB)

Figure 1C: Chip + Heat Spreader (TAB) + Capacitor

- Chip Width and Length vary depending on product dimensions

- Each Parameter has its own respective tolerance that is shown throughout the data sheet

- Figures 1B and 1C have the same Width (X_{TAB})

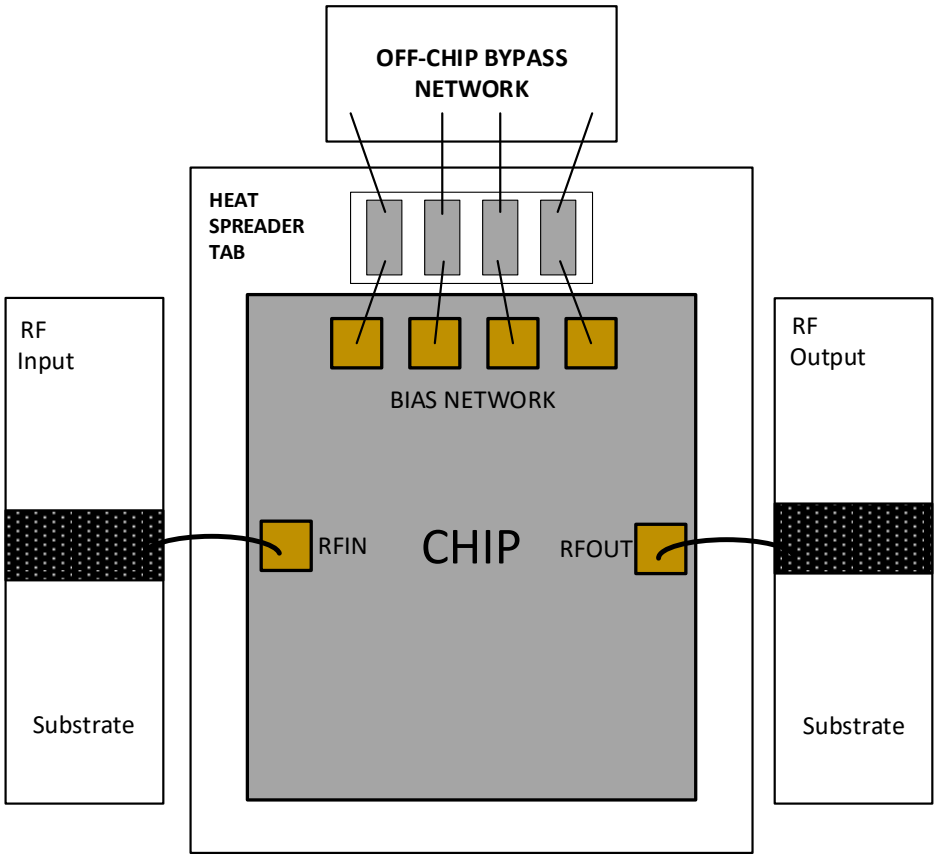
www.ngc.com
www.ngc.com/what-we-do/microelectronics-space-park/
Phone: (310) 814-5000 • Fax: (310) 812-7011 • E-mail: as-mps.sales@ngc.com
Approved for Public Release: NG24-1212.

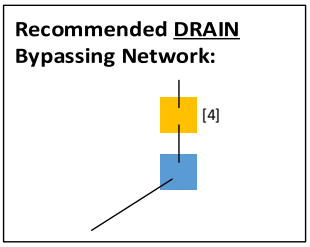
NORTHROP GRUMMAN

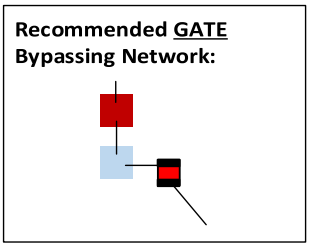
GENERAL BONDING ARRANGEMENT FOR FIGURE 1C

** BELOW LAYOUT SHOWS BONDING ARRANGEMENT OF A GENERIC AMPLIFIER FOR REFERENCE

** SPECIFIC BYPASS INTERCONNECTIONS DRIVEN BY RESPECTIVE CHIP







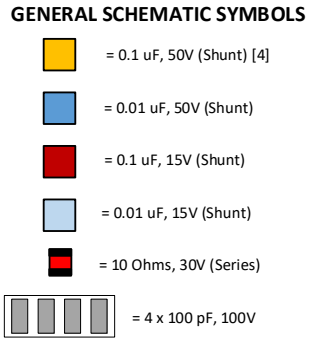


DIAGRAM NOTES

- The 100 pF (15V & 50V) capacitors shown in the "SUGGESTED BONDING ARANGEMENT" Bare Die diagram are replaced with 100 pF (100V) Bar Capacitors for the Capacitor TAB configuration

- The remaining capacitors/resistors previously shown in "SUGGESTED BONDING ARANGEMENT" are the same and now connect to the Bar Capacitors

- Best performance obtained from use of <10 mil (long) by 3 by 0.5 mil ribbons on input and output.

- [4] The 0.1uF, 50V capacitors are not needed if the drain supply line is clean. If Drain Pulsing of the device is to be used, do **NOT** use the 0.1uF , 50V Capacitors.

PLEASE REFER TO OUR "GaN Chip Handling Application Note" BEFORE HANDLING, ASSEMBLING OR BIASING THESE MMICS!

www.ngc.com
www.ngc.com/what-we-do/microelectronics-space-park/
Phone: (310) 814-5000 • Fax: (310) 812-7011 • E-mail: as-mps.sales@ngc.com

Die on Tab
Die on Heat Spreader
Product Datasheet

GENERAL CHIP DIAGRAM FOR DIMENSIONING

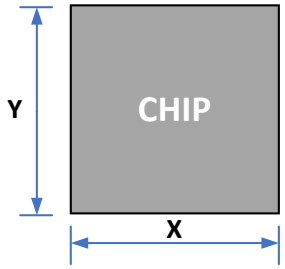


Figure 2A

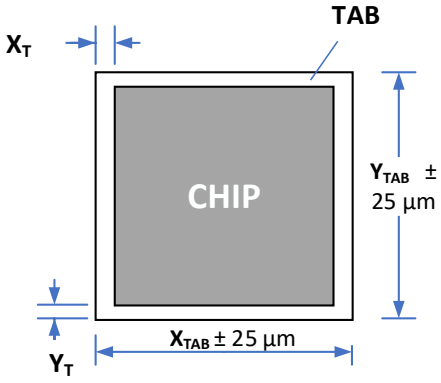


Figure 2B

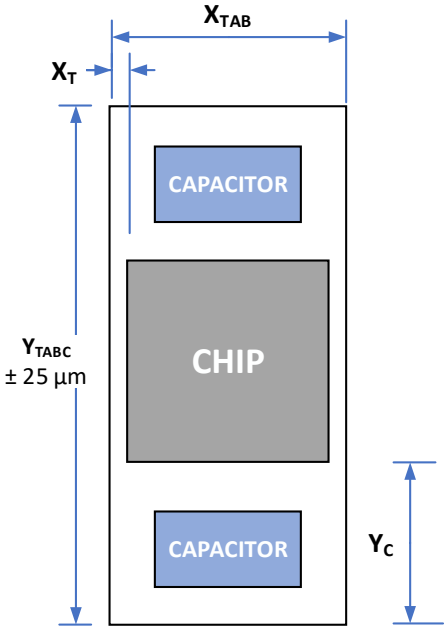


Figure 2C

SCHEMATIC LEGEND

Parameter	Value	Tolerance
Chip Width (X)	See Die Size Page	See Die Size Page
Chip Length (Y)	See Die Size Page	See Die Size Page
Tab-Chip Width Offset (X_T)	38 µm (0.0015″)	-
Tab-Chip Length Offset (Y_T)	38 µm (0.0015″)	-
TAB Width (X_{TAB})	$X_{TAB} = X + 76$ µm	± 25 µm
TAB Length (Y_{TAB})	$Y_{TAB} = Y + 76$ µm	± 25 µm
Chip Edge to TAB Edge Length (Y_C)	1170 µm (0.046″)	-
Tab-Chip-Capacitor Length (Y_{TABC})	$Y_{TABC} = Y + 2 \cdot Y_C$	± 25 µm

NOTES

Figure 2A: Chip

Figure 2B: Chip + Heat Spreader (TAB)

Figure 2C: Chip + Heat Spreader (TAB) + Capacitors

- Chip Width and Length vary depending on product dimensions

- Each Parameter has its own respective tolerance that is shown throughout the data sheet

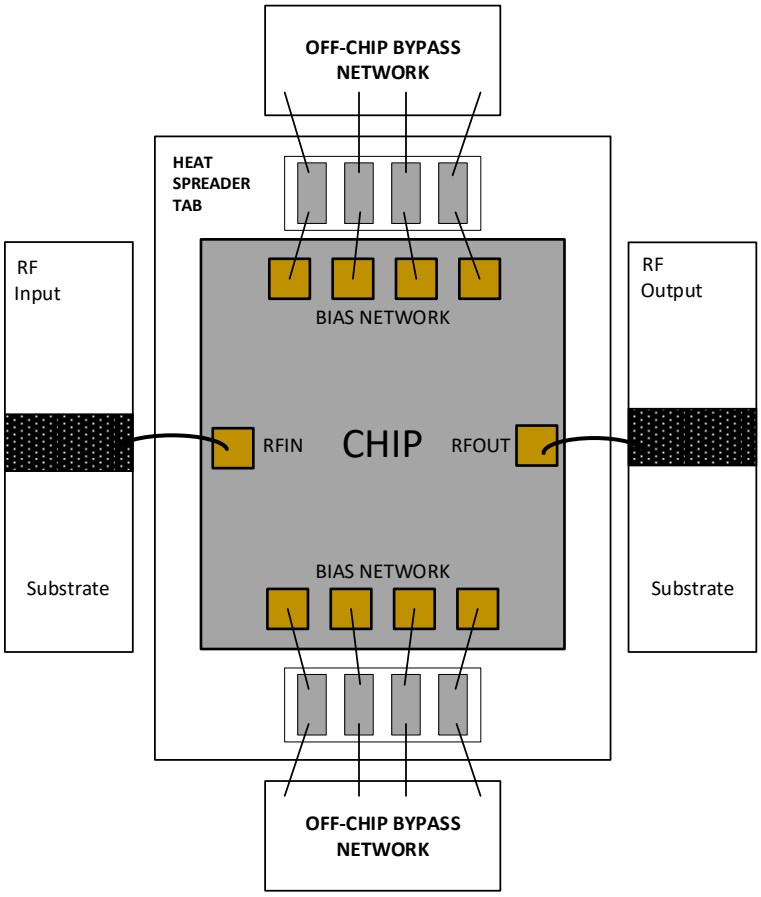
- Figures 2B and 2C have the same Width (X_{TAB})

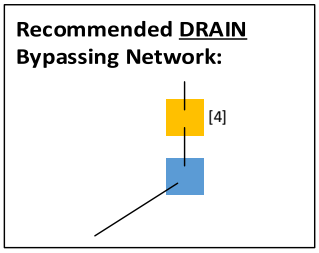
www.ngc.com
www.ngc.com/what-we-do/microelectronics-space-park/
Phone: (310) 814-5000 • Fax: (310) 812-7011 • E-mail: as-mps.sales@ngc.com

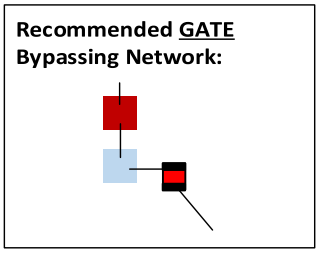
GENERAL BONDING ARRANGEMENT FOR FIGURE 2C

** BELOW LAYOUT SHOWS BONDING ARRANGEMENT OF A GENERIC AMPLIFIER FOR REFERENCE

** SPECIFIC BYPASS INTERCONNECTIONS DRIVEN BY RESPECTIVE CHIP







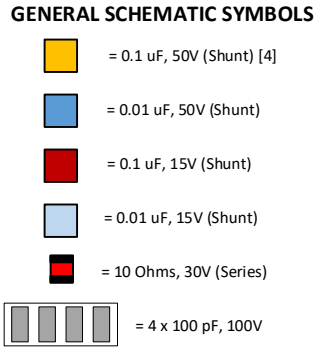


DIAGRAM NOTES

- The 100 pF (15V & 50V) capacitors shown in the "SUGGESTED BONDING ARANGEMENT" Bare Die diagram are replaced with 100 pF (100V) Bar Capacitors for the Capacitor TAB configuration

- The remaining capacitors/resistors previously shown in "SUGGESTED BONDING ARANGEMENT" are the same and now connect to the Bar Capacitors

- Best performance obtained from use of <10 mil (long) by 3 by 0.5 mil ribbons on input and output.

- [4] The 0.1uF, 50V capacitors are not needed if the drain supply line is clean. If Drain Pulsing of the device is to be used, do **NOT** use the 0.1uF , 50V Capacitors.

PLEASE REFER TO OUR "GaN Chip Handling Application Note" BEFORE HANDLING, ASSEMBLING OR BIASING THESE MMICS!

www.ngc.com
www.ngc.com/what-we-do/microelectronics-space-park/
Phone: (310) 814-5000 • Fax: (310) 812-7011 • E-mail: as-mps.sales@ngc.com