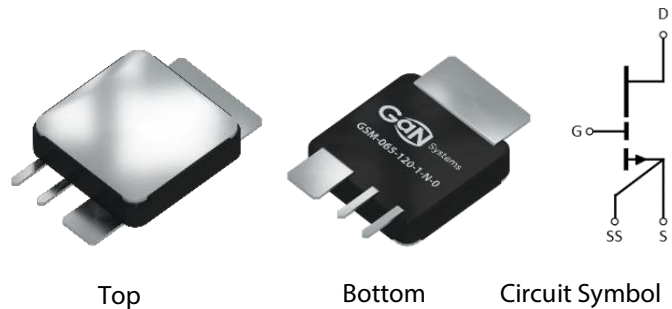


Features

- 650V
- High Current: 120A and 240A
- High Power: up to 95kW
- Easy to use package
- Parallel E-HEMT demonstration
- Island Technology®
- Zero Reverse Recovery current
- High switching frequency
- High Efficiency
- Source sense
- Size 32.3mm x 21.6mm



Description

The GSM-065-xxx evaluation modules are a convenient way for designers to evaluate GaN Systems' newest 650V, high current GS-065-120-1-D die offering. The evaluation module is design as a top-side cooled package to facilitate the assembly and evaluation of the device's thermal and electrical performance. Two versions of the evaluation module are presently being offered:

- 1) **120A:** The GSM-065-120-1-N-0 contains one single GS-065-120-1-D.
- 2) **240A:** The GSM-065-240-1-N-0 contains two GS-065-120-1-D, connected in parallel for higher current applications and as a demonstration vehicle for general paralleling of GSM-065 devices. For further information concerning current scaling by paralleling, refer to Application Note [GN004](#).

Applications

- Energy Storage Systems
- Battery charging
- EV OBC
- DC-DC Converters

Block Diagrams

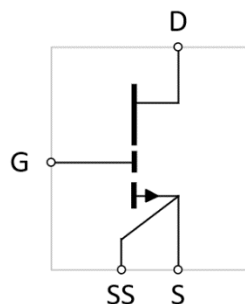


Figure 1: GSM-065-120-1-N-0

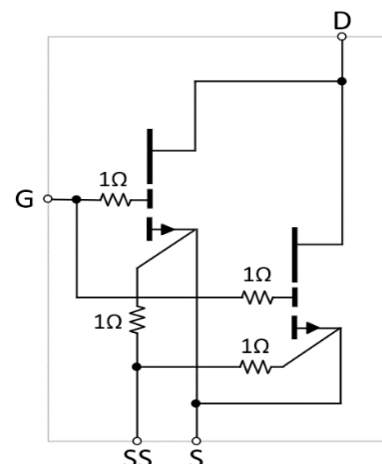


Figure 2: GSM-065-240-1-N-0

Ordering Information

Part number	Ids	Rdson	R _{θJC}	Ordering Code
GSM-065-120-1-N-0	120A	12 mΩ	0.46 (°C/W)	Contact Factory
GSM-065-240-1-N-0	240A	6 mΩ	0.23 (°C/W)	Contact Factory

Absolute Maximum Ratings ($T_{case} = 25\text{ }^{\circ}\text{C}$ except as noted)

Parameter	Symbol	Value	Unit
Operating Junction Temperature	T_J	-55 to +150	$^{\circ}\text{C}$
Storage Temperature Range	T_S	-55 to +150	$^{\circ}\text{C}$
Drain-to-Source Voltage	V_{DS}	650	V
Gate-to-Source Voltage	V_{GS}	-10 to +7	V
Gate-to-Source Voltage transient (Note 1)	$V_{GS(TRANSIENT)}$	-20 to +10	V
GSM-065-120-1-N-0			
Continuous Drain Current (Note 2)	I_{DS}	120	A
Continuous Drain Current $T_{case}=100\text{ }^{\circ}\text{C}$ (Note 2)	I_{DS}	94	A
GSM-065-240-1-N-0			
Continuous Drain Current (Note 2)	I_{DS}	240	A
Continuous Drain Current $T_{case}=100\text{ }^{\circ}\text{C}$ (Note 2)	I_{DS}	188	A

1) Pulse $\leq 1\text{ }\mu\text{s}$

2) Limited by saturation

Electrical Characteristics: GS-065-120-1-N-0

(Typical values at $T_J = 25\text{ }^{\circ}\text{C}$, $V_{GS} = 6\text{ V}$ unless otherwise noted)

Parameter	Sym.	Min.	Typ.	Max.	Unit	Conditions
Drain-to-Source Blocking Voltage	B_{VDS}	650			V	$V_{GS}=0\text{ V}$, $I_{DSS} < 50\text{ }\mu\text{A}$
Drain-to-Source On Resistance	$R_{DS(on)}$		12		m Ω	$V_{GS} = 6\text{ V}$, $T_J = 25\text{ }^{\circ}\text{C}$ $I_{DS} = 9\text{ A}$
Gate Threshold Turn on Voltage	$V_{GS(th)}$		1.3		V	$V_{DS} = V_{GS}$, $I_D = 7\text{ mA}$
Drain to Source Leakage Current	I_{DSS}		8		μA	$V_{DS} = 650\text{ V}$, $V_{GS} = 0\text{ V}$
Input Capacitance	C_{ISS}		1100		pF	$V_{DS} = 400\text{ V}$ $V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$
Output Capacitance	C_{OSS}		350		pF	
Reverse Transfer Capacitance	C_{RSS}		8		pF	
Total Gate Charge	Q_G		25		nC	$V_{GS} = 0\text{ to }6\text{ V}$ $V_{DS} = 400\text{ V}$
Gate-to-Source Charge	Q_{GS}		8.8		nC	
Gate-to-Drain Charge	Q_{GD}		6.8		nC	
Output Charge	Q_{OSS}		226		nC	$V_{GS} = 0\text{ V}$, $V_{DS} = 400\text{ V}$
Reverse Recovery Charge	Q_{RR}		0		nC	

Note: These specifications are based on the GS-065-120-1-D.

Electrical Characteristics: GS-065-240-1-N-0

(Typical values at $T_J = 25\text{ }^{\circ}\text{C}$, $V_{GS} = 6\text{ V}$ unless otherwise noted)

Parameter	Sym.	Min.	Typ.	Max.	Unit	Conditions
Drain-to-Source Blocking Voltage	B_{VDS}	650			V	$V_{GS}=0\text{ V}$, $I_{DSS} < 50\text{ }\mu\text{A}$
Drain-to-Source On Resistance	$R_{DS(on)}$		6		$\text{m}\Omega$	$V_{GS} = 6\text{ V}$, $T_J = 25\text{ }^{\circ}\text{C}$ $I_{DS} = 9\text{ A}$
Gate Threshold Turn on Voltage	$V_{GS(th)}$		1.3		V	$V_{DS} = V_{GS}$, $I_D = 7\text{ mA}$
Drain to Source Leakage Current	I_{DSS}		16		μA	$V_{DS} = 650\text{ V}$, $V_{GS} = 0\text{ V}$
Input Capacitance	C_{ISS}		2200		pF	$V_{DS} = 400\text{ V}$ $V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$
Output Capacitance	C_{OSS}		700		pF	
Reverse Transfer Capacitance	C_{RSS}		16		pF	
Total Gate Charge	Q_G		50		nC	$V_{GS} = 0\text{ to }6\text{ V}$ $V_{DS} = 400\text{ V}$
Gate-to-Source Charge	Q_{GS}		17.6		nC	
Gate-to-Drain Charge	Q_{GD}		13.6		nC	
Output Charge	Q_{OSS}		452		nC	$V_{GS} = 0\text{ V}$, $V_{DS} = 400\text{ V}$
Reverse Recovery Charge	Q_{RR}		0		nC	

NOTE: These specifications are based on the GS-065-120-1-D.

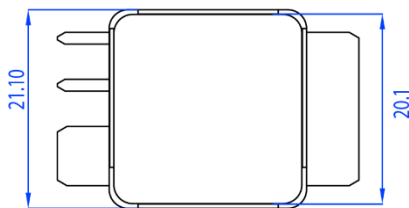
Dimensions


Figure 3: Top view

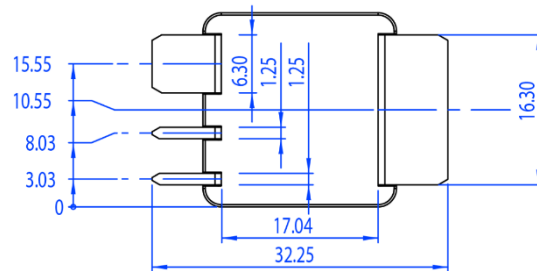


Figure 4: Bottom view

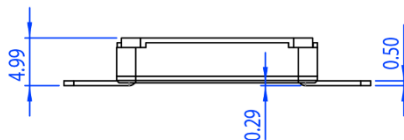


Figure 5: Side view

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