

INF-065D090AGA

650V 90mΩ GaN HEMT Discrete in PDFN8

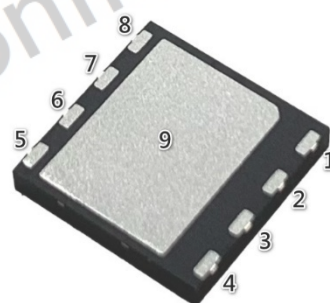
Description

The INF-065D090AGA is a normally-on D-mode Gallium Nitride (GaN) high electron mobility transistor (HEMT) device in discrete configuration. With the characteristics of high breakdown voltage, high current and high switching frequency, it is suitable for high power applications.

Key Specifications

Part Number	INF-065D090AGA
V_{DS} (V), min.	650
$V_{(TR)DS}$ (V)	800
$R_{DS(ON)}$ (mΩ), typ.	90
Q_G (nC), typ.	24
Package	PDFN8 8 x 8 mm

INF-065D090AGA: (PDFN8 8x8 mm)



Drain: 1, 2, 3, 4

Source: 5, 6

Kelvin Source: 7

Gate: 8

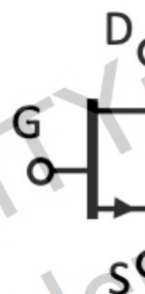
9: Floating

Features

- Gate drive voltage compatibility (-22V to 10V)
- High switching frequency

Applications

- Switch Mode Power Supplies (SMPS)
- AC-DC/ DC-DC Converters
- Motor Drives



Discrete Schematic Symbol

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1. Electrical Characteristics

➤ **Table 1. Absolute maximum ratings**

Symbol	Parameter		Value	Unit
V_{DSS}	Drain-source voltage		650	V
$V_{(TR)DSS}$	Transient drain to source voltage ^a		800	V
V_{GSS}	Gate-source voltage		-22 ~ 10	V
I_D	Drain current (continuous) at $T_C = 25^\circ\text{C}$ operation		14	A
	Drain current (continuous) at $T_C = 100^\circ\text{C}$ operation		10	A
I_{DM}	Pulsed drain current (pulse width: 10 μs)		57	A
T_C	Operating temperature	Case	-55 to +150	$^\circ\text{C}$
T_J		Junction	-55 to +150	$^\circ\text{C}$
T_S	Storage temperature		-55 to +150	$^\circ\text{C}$
T_{SOLD}	Soldering peak temperature ^b		260	$^\circ\text{C}$

Note:

- a. In off-state, spike duty cycle $D < 0.01$, spike duration $< 1\mu\text{s}$
b. For 10 sec., 1.6 mm from the case

➤ **Table 2. Thermal Characteristics**

TBD

➤ **Table 3. Electrical Characteristics** ($T_{CASE} = 25\text{ }^{\circ}\text{C}$ unless otherwise stated)

Symbol	Parameter	Conditions	Values			Unit
			min.	typ.	max.	
$V_{(BL)DSS}$	Drain-source voltage	$V_{GS} = -22\text{ V}$	650	-	-	V
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = 10\text{ V}, I_D = 25\text{ }\mu\text{A}$	-18	-15	-12	V
$R_{DS(on)}$	Static drain-source on-resistance	$V_{GS} = 0\text{ V}, I_D = 8.5\text{ A}, T_J = 25\text{ }^{\circ}\text{C}$	-	90	110	m Ω
		$V_{GS} = 0\text{ V}, I_D = 8.5\text{ A}, T_J = 150\text{ }^{\circ}\text{C}$	-	180	-	
I_{DSS}	Drain-source leakage current	$V_{GS} = -22\text{ V}, V_{DS} = 650\text{ V}, T_J = 25\text{ }^{\circ}\text{C}$	-	2	25	μA
		$V_{GS} = -22\text{ V}, V_{DS} = 650\text{ V}, T_J = 150\text{ }^{\circ}\text{C}$	-	15	-	
I_{GSS}	Gate-to-source forward leakage current	$V_{GS} = 10\text{ V}$	-	-	100	nA
	Gate-to-source reverse leakage current	$V_{GS} = -22\text{ V}$	-	-	-100	
C_{iss}	Input capacitance	$V_{GS} = -22\text{ V}, V_{DS} = 400\text{ V}, F = 1\text{ MHz}$	-	200.8	-	pF
C_{oss}	Output capacitance		-	19.3	-	
C_{rss}	Reverse transfer capacitance		-	14.4	-	
Q_G	Gate charge	$V_{GS} = -22\sim 0\text{ V}, V_{DS} = 400\text{ V}, I_{DS} = 8.5\text{ A}$	-	24.4	-	nC
Q_{GS}	Gate-source charge		-	3.2	-	
Q_{oss}	Output charge	$V_{GS} = -22\text{ V}, V_{DS} = 0\sim 400\text{ V}$	-	11.1	-	nC
$t_{D(on)}$	Turn-on delay time	$V_{DS} = 400\text{ V}, V_{GS} = -22\text{ to }0\text{ V}, I_{DS} = 2\text{ A}, R_G = 25\text{ }\Omega$	-	TBD	-	ns
$t_{D(off)}$	Turn-off delay time		-	TBD	-	

2. Typical Characteristic Curves (TC = 25 °C unless otherwise stated)

Note: The characteristic curves were measured from the discrete product packaged as 8x8 pDFN8.

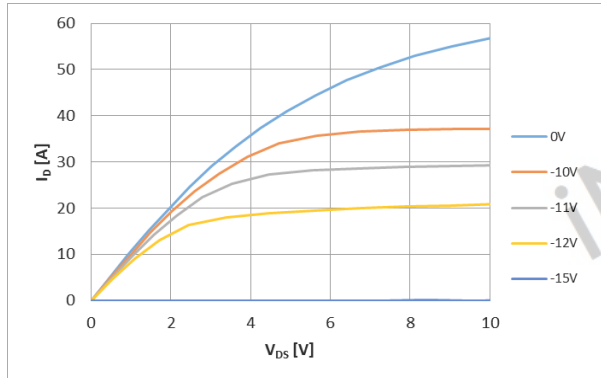


Figure 1 Typical Output Characteristics $T_j = 25\text{ }^{\circ}\text{C}$
(Parameter : V_{GS})

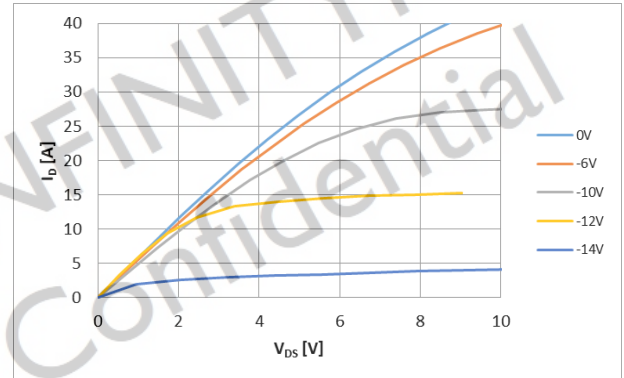


Figure 2 Typical Output Characteristics $T_j = 150\text{ }^{\circ}\text{C}$
(Parameter : V_{GS})

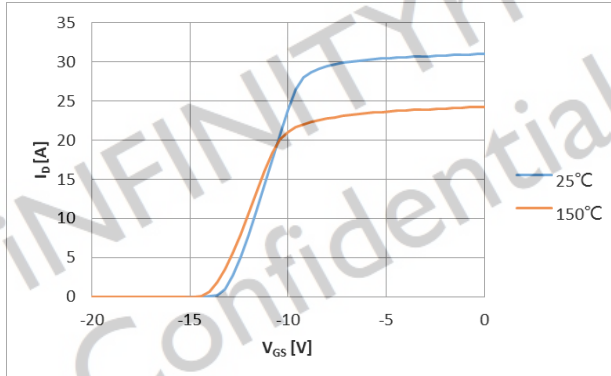


Figure 3. Typical Transfer Characteristics
 $V_{DS} = 10\text{ V}$, parameter: T_j

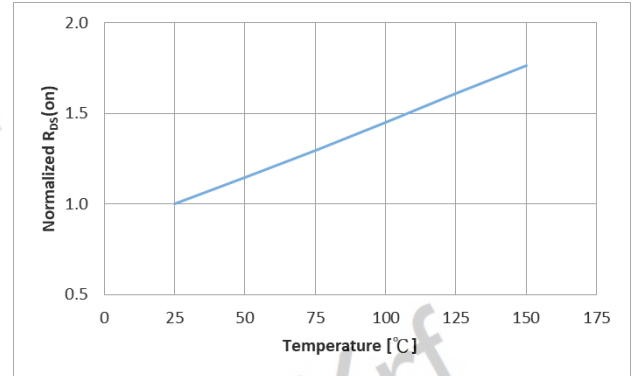


Figure 4. Normalized On-resistance
 $I_D = 8.5\text{ A}$, $V_{GS} = 10\text{ V}$

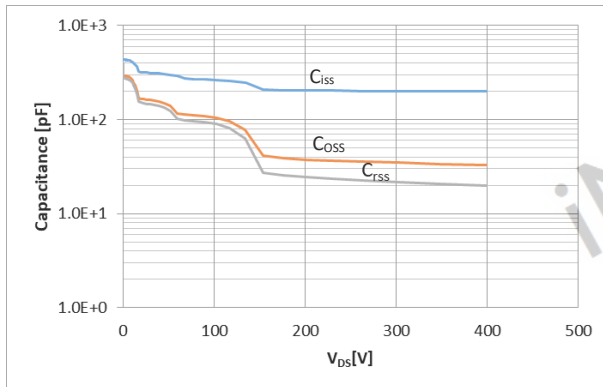


Figure 5. Typical Capacitance

$V_{GS} = -22 \text{ V}$, $f = 1 \text{ MHz}$

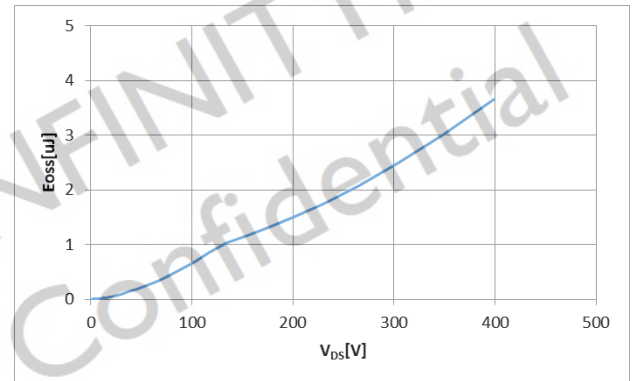


Figure 6. Typical E_{oss} Stored Energy

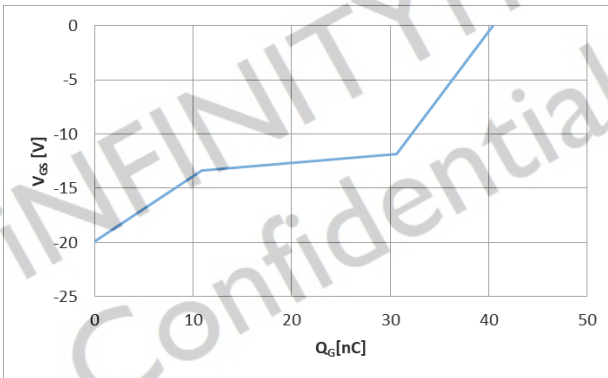


Figure 7. Typical Gate Charge

$I_{DS} = 8.5 \text{ A}$, $V_{DS} = 400 \text{ V}$

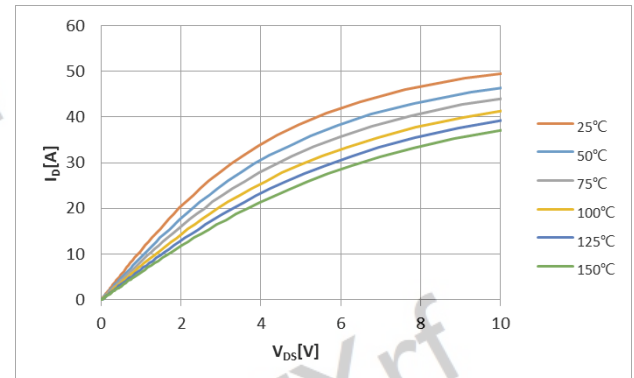
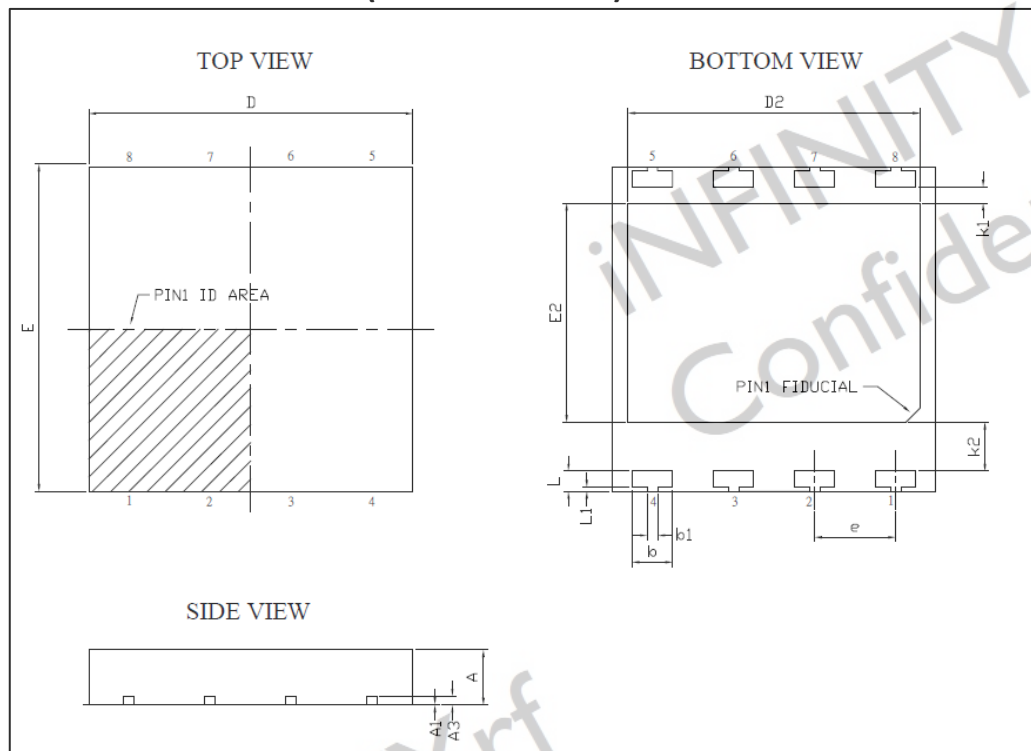


Figure 8. Characteristics for various temperatures
Parameter: T_J

3. Package Dimensions

INF-065D090AGA (PDFN8 8 x 8 mm)



➤ **Table 4** Dimension of INF-065D090AGA

Symbol	DIMENSION (MM)			Symbol	DIMENSION (MM)		
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.
A	1.20	1.25	1.30	b	0.90	1.00	1.10
A1	0	0.02	0.05	b1	0.25 REF		
A3	0.203 REF			L	0.40	0.50	0.60
D	7.90	8.00	8.10	L1	0.10 REF		
E	7.90	8.00	8.10	K1	0.30	0.40	0.50
D2	7.10	7.20	7.30	K2	1.10	1.20	1.30
E2	5.30	5.40	5.50	e	2.00 REF		