

INF-120E150WZA

1200V 150mΩ GaN HEMT Wafer

Description

The INF-120E150WZA is a normally-on D-mode Gallium Nitride (GaN) high electron mobility transistor (HEMT) device in wafer form. With the characteristics of high breakdown voltage, high current and high switching frequency, it is suitable for high power applications.

Applications

- Power Adapters / Converter
- PFC Application
- Appliance Motor Drives
- Wireless Power Transfer
- Synchronous Rectifier for Application

Key Features

Parameter	Value	Unit
BV_{DSS}	1200	V
I_D	10.8	A
Die Size	3761 x 1742	μm
Gross Die	994	pieces

Chip Size & Pad Position (unit: μm)

Die w/o scribe line (50 μm)

A1 (0,0), A2 (3711,1692)

Gate

G1 (49,1520), G2 (189,1660)

G3 (3523,1660), G4 (3663,1520)

Source

S1 (224,1520), S2 (3488,1660)

Drain

D1 (49,26), D2 (3663,166)

Die Descriptions

- Wafer Size: 4 inch (± 0.1 inches)
- Wafer thickness: 650 ± 25 μm
- Die Size: 3761 x 1742 μm
- Scribe Line Width: 50 μm
- Pad Metal: Al
- Metal Thickness: 4 μm
- Dimension of Bonding Area: (unit: μm^2)
 - Gate Pad: 140*140 μm^2
 - Drain Pad: 3264*140 μm^2
 - Source Pad: 3614*140 μm^2
- Gross Die / Wafer: 994 pieces (E.E=2mm)

Absolute Maximum Ratings ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-source voltage	1200	V
$V_{(TR)DSS}$	Transient drain to source voltage ^a	1400	V
V_{GSS}	Gate-source voltage	-22 ~ 10	V
I_D	Drain current (continuous) at $T_c = 25^\circ\text{C}$ operation	10.8	A
	Drain current (continuous) at $T_c = 100^\circ\text{C}$ operation	7.5	A
I_{DM}	Pulsed drain current (pulse width: 10 μs)	43	A
T_J	Operating temperature	-55 to +150	$^\circ\text{C}$

Note:

a. In off-state, spike duty cycle $D < 0.01$, spike duration $< 1\mu\text{s}$ **Static Electrical Characteristic** ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Values			Unit
			Min.	Typ.	Max.	
BV_{DSS}	Drain-Source Breakdown Voltage	$V_G = -22\text{ V}$, $I_D = 10\text{ }\mu\text{A}$,	1200			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_D = 10\text{ V}$, $I_D = 1\text{ mA}$	-18	-15	-12	V
I_{GSS}	Gate -Source Leakage Current	$V_D = 0\text{ V}$, $V_G = -22\text{ V}$	-		100	nA
I_{DSS}	Drain-Source Leakage Current	$V_D = 1200\text{ V}$, $V_G = -22\text{ V}$	-		2	μA
$R_{DS(on)}$	Drain-Source on-state Resistance	$I_D = 2\text{ A}$, $V_G = 0\text{ V}$	-	150		$\text{m}\Omega$
I_{DM}	Pulsed drain current (pulse with: 10 μs)	$V_D = 10\text{ V}$, $V_G = 0\text{ V}$		43		A

1) Performance will vary pursuant to the assembly techniques and substrate of choice.

Typical Characteristic Curves ($T_c = 25^\circ\text{C}$ unless otherwise noted)

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

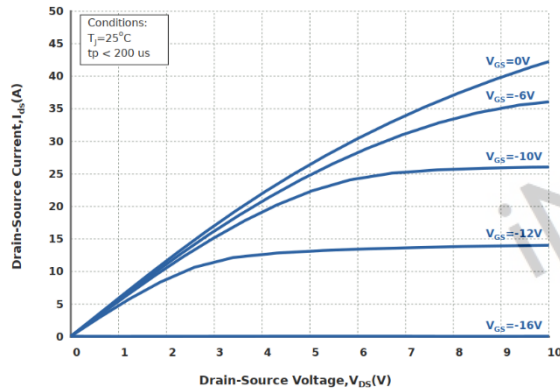


Figure 1 Typical Output Characteristics $T_j = 25^\circ\text{C}$
(Parameter : V_{GS})

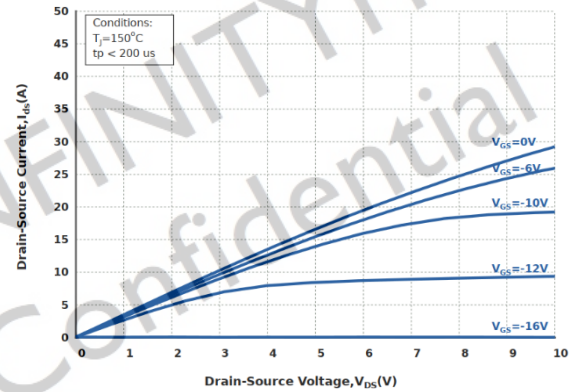


Figure 2 Typical Output Characteristics $T_j = 150^\circ\text{C}$
(Parameter : V_{GS})

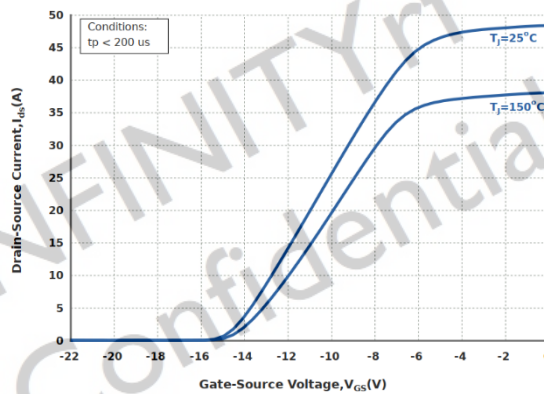


Figure 3. Typical Transfer Characteristics
 $V_{DS} = 10\text{ V}$, parameter: T_j

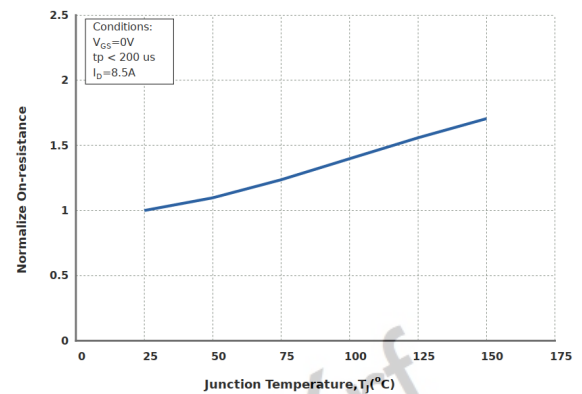


Figure 4. Normalized On-resistance
 $I_D = 8.5\text{ A}$, $V_{GS} = 10\text{ V}$

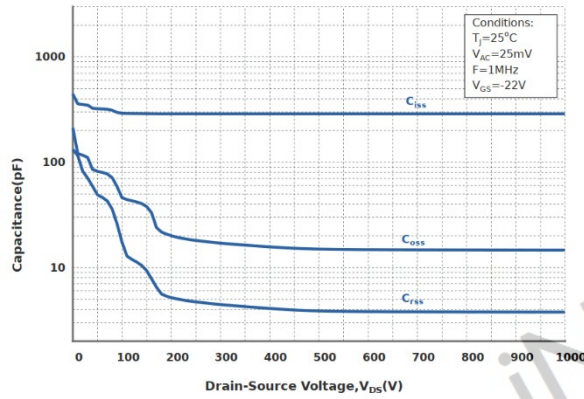


Figure 5. Typical Capacitance
 $V_{GS} = -22\text{ V}$, $f = 1\text{ MHz}$

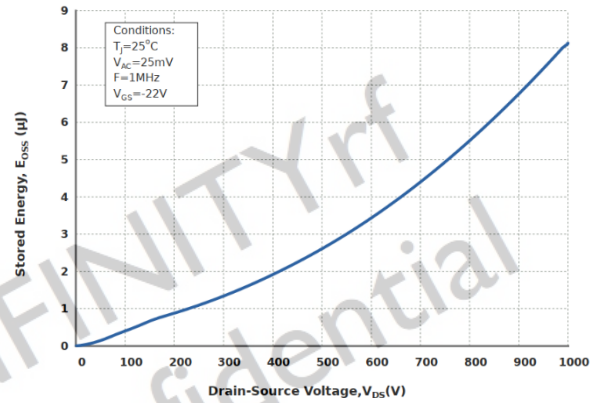


Figure 6. Typical Eoss Stored Energy

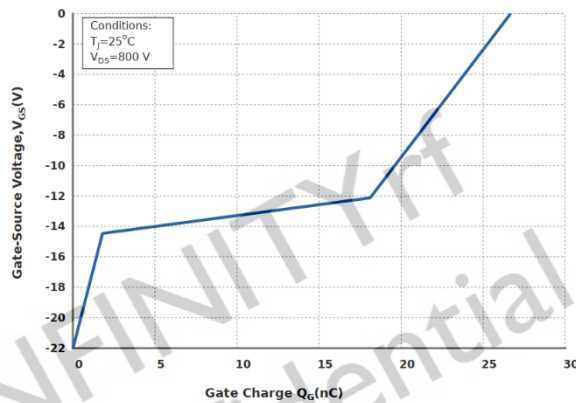


Figure 7. Typical Gate Charge
 $I_{DS} = 8.5\text{ A}$, $V_{DS} = 400\text{ V}$

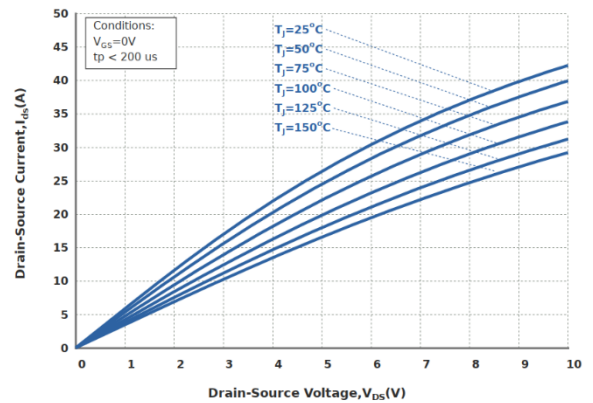


Figure 8. Characteristics for various temperatures
Parameter: T_j