

INF-065G025WZA

650V 25mΩ GaN HEMT Wafer

Description

The INF-065G025WZA 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}	650	V
I_D	32	A
Die Size	6337 x 3360	μm
Gross Die	270	pieces

Chip Size & Pad Position (unit: μm)

Die w/o scribe line(50um)

A1(0,0), A2(6287,3310)

Gate

G1(6142,3303), G2(6282,3163)

G3(6142,196), G4(6282,56)

Source

S1(245,1750), S2(6142,3126), S3(6142,1609), S4(6280,235)

Drain

D1(54,3306), D2(194,197), D3(6100,3168), D4(6100,54)

Die Descriptions

- Wafer Size: 4 inch (± 0.1 inches)
- Wafer thickness: $650 \pm 25 \mu\text{m}$
- Die Size: $6337 \times 3360 \mu\text{m}$
- Scribe Line Width: $50 \mu\text{m}$
- Pad Metal: Al
- Metal Thickness: $4 \mu\text{m}$
- Dimension of Bonding Area: (unit: μm^2)
 - Gate Pad: $140 \times 140 \mu\text{m}^2$
 - Drain Pad: $6049 \times 140 \mu\text{m}^2$ (ref.)
 - Source Pad: $6037 \times 140 \mu\text{m}^2$ (Ref.)
- Gross Die / Wafer: 270 pieces (E.E=2mm)

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage	650	V
$V_{(TR)DS}$	Transient drain to source voltage ^a	800	V
V_{GS}	Gate-source voltage	-22 ~ 10	V
I_D	Drain current (continuous) at $T_c = 25^\circ\text{C}$ operation	32	A
	Drain current (continuous) at $T_c = 100^\circ\text{C}$ operation	21.3	A
I_{DM}	Pulsed drain current (pulse width: 10 μs)	128	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_{DS}	Drain-Source Breakdown Voltage	$V_G = -22\text{ V}$, $I_D = 10\text{ }\mu\text{A}$,	650			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	$V_D = 0\text{ V}$, $V_G = -22\text{ V}$	-		200	nA
I_{DSS}	Drain-Source Leakage Current	$V_D = 650\text{ V}$, $V_G = -22\text{ V}$	-		25	μA
$R_{DS(on)}$	Drain-Source on-state Resistance	$I_D = 2\text{ A}$, $V_G = 0\text{ V}$	-	25		$\text{m}\Omega$
I_{DM}	Pulsed drain current (pulse with: 10 μs)	$V_D = 3\text{ V}$, $V_G = 0\text{ V}$		128		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.

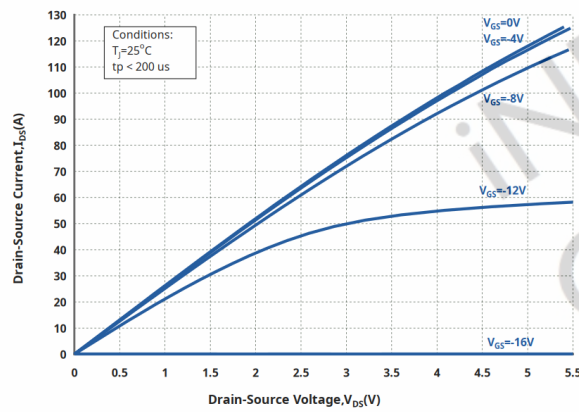


Figure 1 Typical Output Characteristics $T_j = 25^\circ\text{C}$
(Parameter : V_{GS})

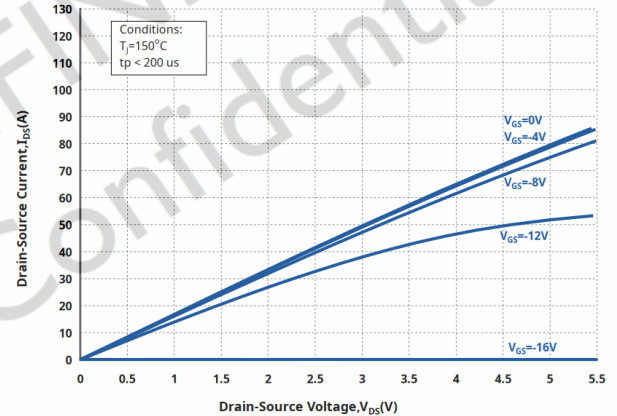


Figure 2 Typical Output Characteristics $T_j = 150^\circ\text{C}$
(Parameter : V_{GS})

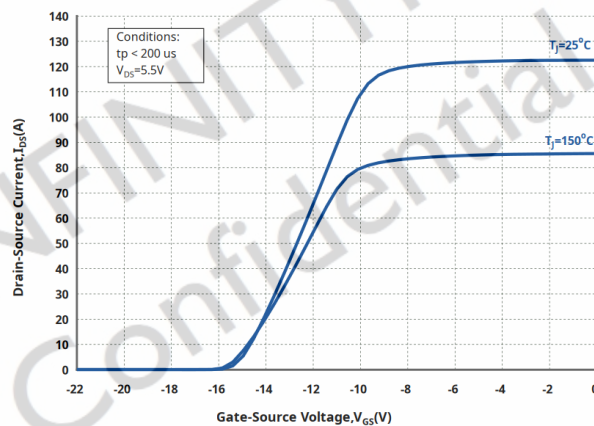


Figure 3. Typical Transfer Characteristics
 $V_{DS} = 5.5\text{ V}$, parameter: T_j

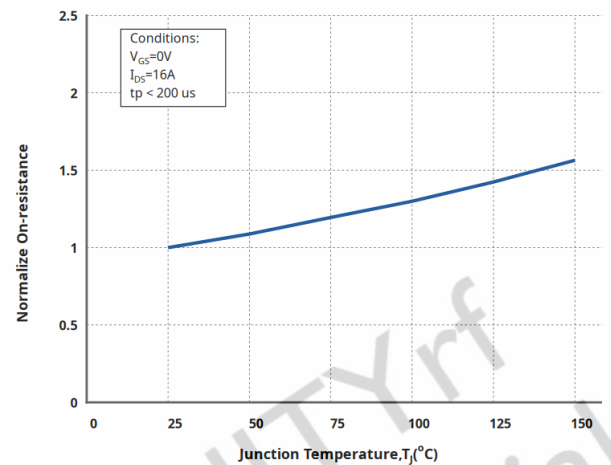


Figure 4. Normalized On-resistance
 $I_D = 16\text{ A}$, $V_{GS} = 0\text{ V}$

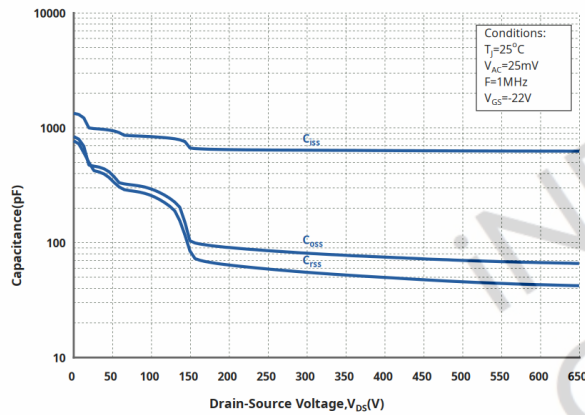


Figure 5. Typical Capacitance
 $V_{GS} = -22\text{ V}$, $f = 1\text{ MHz}$

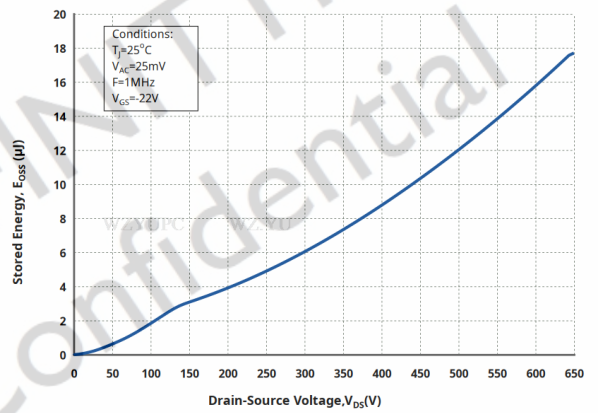


Figure 6. Typical E_{oss} Stored Energy

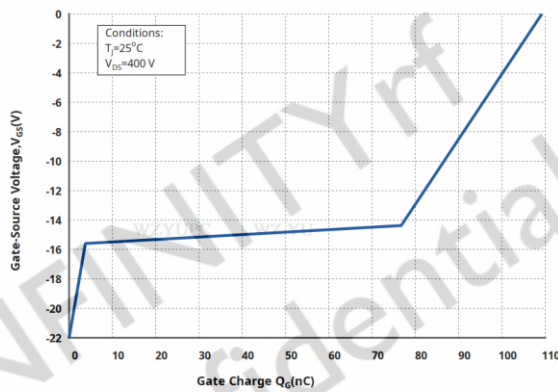


Figure 7. Typical Gate Charge
 $I_{DS} = 8.5\text{ A}$, $V_{DS} = 400\text{ V}$

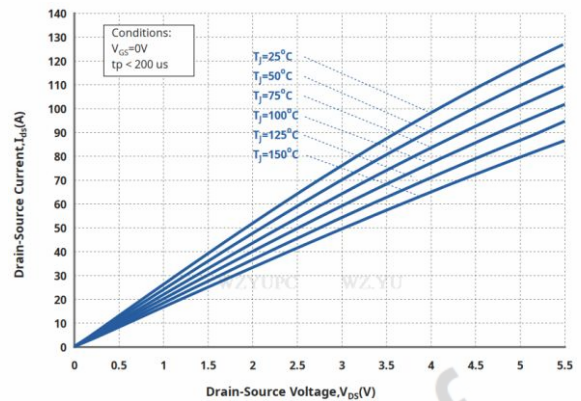


Figure 8. Characteristics for various temperatures
Parameter: T_j

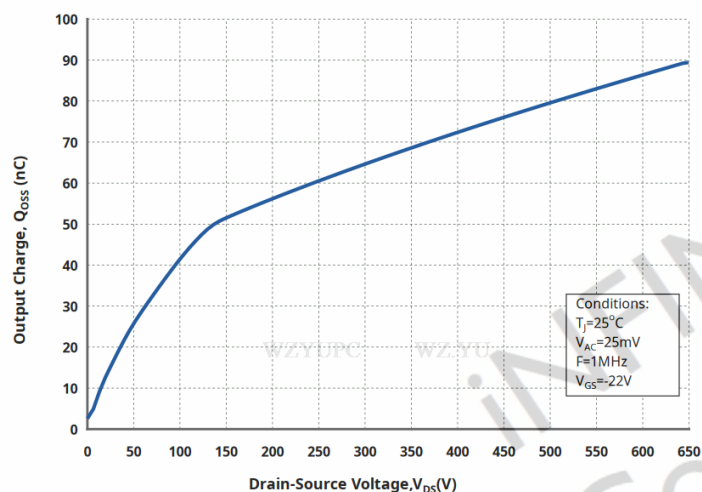


Figure 9. Typical output charge Q_{oss} ,
 $V_{GS} = -22\text{ V}$, $V_{DS} = 0 \sim 650\text{ V}$