

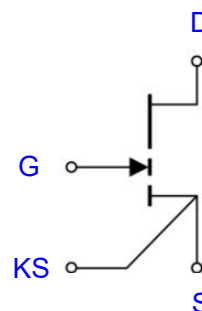
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DX65F130 E-mode 650V,15A,130mΩ GaN HEMT

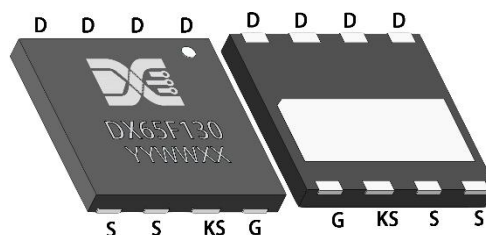
1. Features

- 650 V enhancement mode power switch
- $R_{DS(on)} = 130m\Omega$
- $I_{DS(max)} = 15A$
- Easy gate drive requirements (0 V to 6 V)
- Very high switching frequency (> 10 MHz)
- Fast and controllable fall and rise times
- Zero reverse recovery loss

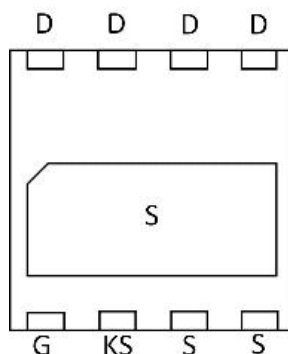


2. Device Information

Part Number	Marking Code	Package	Packing
DX65F130	DX6515FE	DFN8x8	260/tray



DX65F130 DFN8x8



DX65F130 Bottom View

3. Applications

- Fast Battery Charging
- LED lighting drivers
- Power Factor Correction
- LLC Converters
- Wireless Power Transfer

4. Description

DX65F130 is an enhancement mode GaN-on-silicon transistor. GaN is a wide band gap semiconductor with high power density. The gallium nitride transistor is characterized by no body diode, so the reverse recovery charge is zero.

5. Absolute Maximum Ratings (Tc=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit	Condition
Drain-Source voltage	V _{DS}	650	V	
Gate-source voltage	V _{GS}	-10 to 6	V	
Continuous drain current*	I _D	18	A	Tc=25°C
		14	A	Tc=125°C
Operation and storage temperature	T _j	-55 to 150	°C	
	T _{stg}	-55 to 150	°C	

* An Estimated Value

6. Electrical Characteristics (Tc=25°C unless otherwise specified)

Thermal characteristics

Parameter	Symbol	Values	Unit	Note/Test Condition
Thermal resistance, junction-ambient	R _{thJA}	60.3	°C/W	
Thermal resistance, junction-case	R _{thJC}	1.1	°C/W	
Maximum reflow soldering temperature	T _{sold}	260	°C	MSL3

6.1 Typical Performance – Static

Parameter	Symbol	Values			Unit	Test condition
		Min.	Type.	Max.		
Drain source breakdown voltage	BV_{DS}	650	/	/	V	$V_{GS}=0V, I_D=20\mu A$
Total drain leakage current	I_{DSS}	/	0.7	25	μA	$V_{DS}=650V, V_{GS}=0V, T_j=25^\circ C$
		/	6	200	μA	$V_{DS}=650V, V_{GS}=0V, T_j=150^\circ C$
Gate-to-source current	I_{GS}	/	66	/	μA	$V_{DS}=0V, V_{GS}=6V, T_j=25^\circ C$
Static drain-source on-resistance	$R_{DS(ON)}$	/	104	130	m Ω	$V_{GS}=6V, I_D=3A, T_j=25^\circ C$
		/	215	/	m Ω	$V_{GS}=6V, I_D=3A, T_j=150^\circ C$
Gate threshold voltage	$V_{GS(th)}$	1.2	1.6	2.0	V	$V_{DS}=V_{GS}, I_D=3.5mA,$

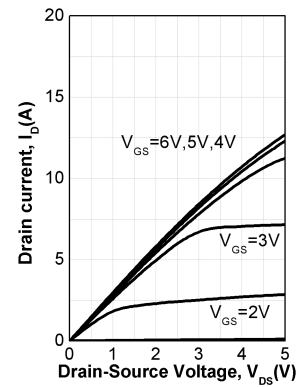
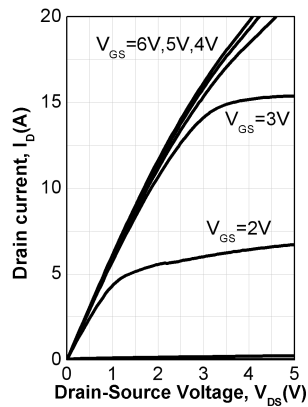
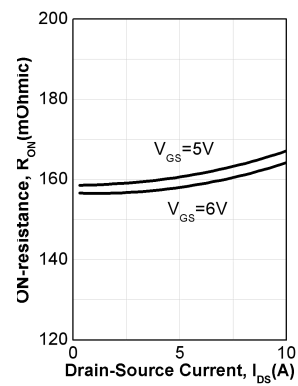
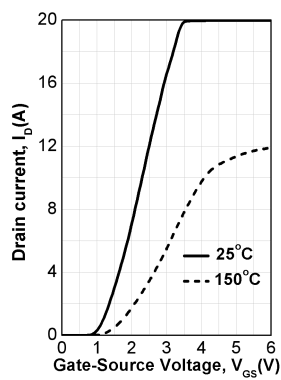
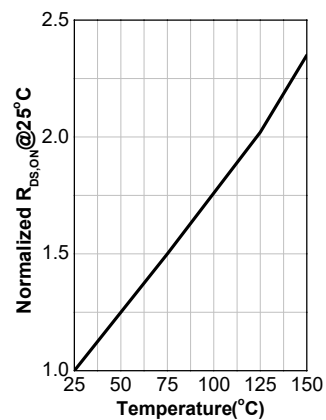
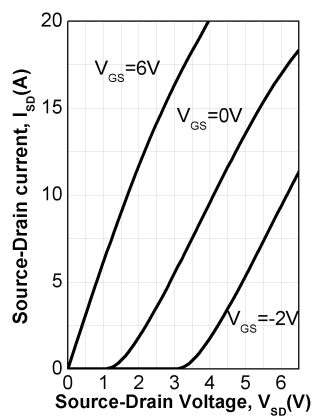
6.2 Typical Performance – Dynamic

Parameter	Symbol	Values			Unit	Test condition
		Min	Type	Max		
Input capacitance	C_{ISS}	/	119	/	pF	$V_{DS}=400V, V_{GS}=0V, f=1MHz$
Output capacitance	C_{OSS}	/	39	/	pF	
Reverse transfer capacitance	C_{RSS}	/	0.3	/	pF	
Output capacitance, energy related	$C_{OSS(er)}$	/	48	/	pF	$V_{DS}=0V$ to 400V, $V_{GS}=0V$
Output capacitance time related	$C_{OSS(tr)}$	/	78	/	pF	
Total gate charge	Q_G	/	3.7	/	nC	$V_{DS}=400V, V_{GS}=0V$ to 6V
Gate-drain charge	Q_{GD}	/	1.4	/	nC	
Gate-source charge	Q_{GS}	/	0.2	/	nC	
Gate Resistance	R_G	/	3.3	/	Ω	$f = f_{res}$, Open drain

6.3

Characteristic

Curve

Typical output characteristics @ $T_j = 25^\circ\text{C}$ Typical output characteristics @ $T_j = 150^\circ\text{C}$ Typical transfer characteristics @ $V_{DS} = 5V$ ON-resistance for various drain current @ 25°C 

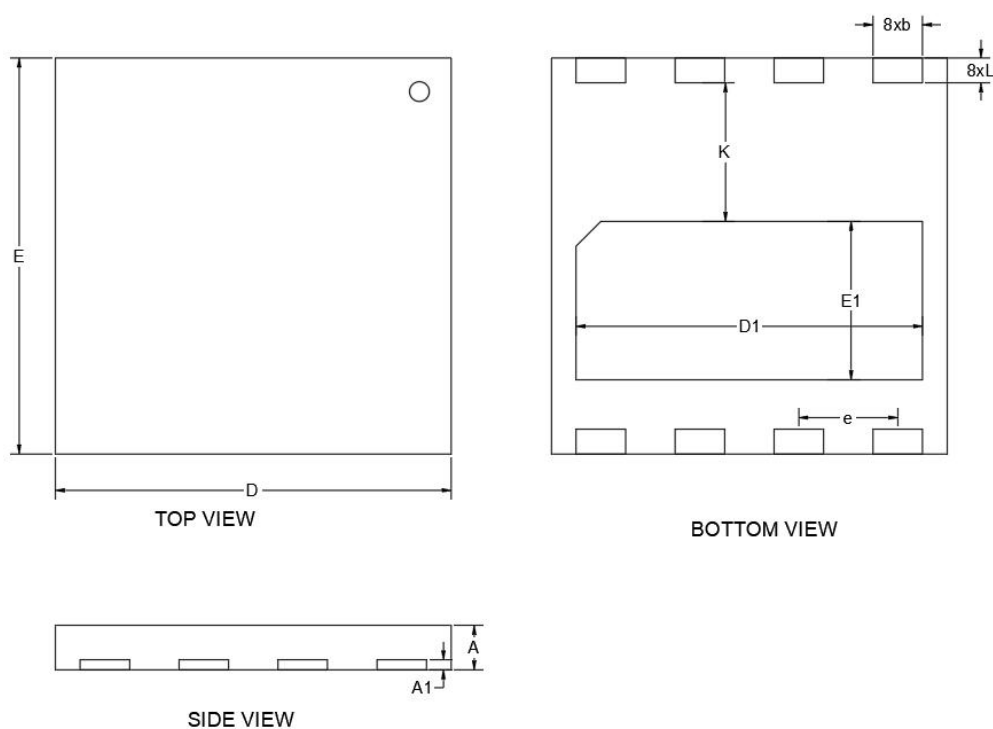
Typical reverse conduction characteristics

Normalized ON-resistance at various temperatures

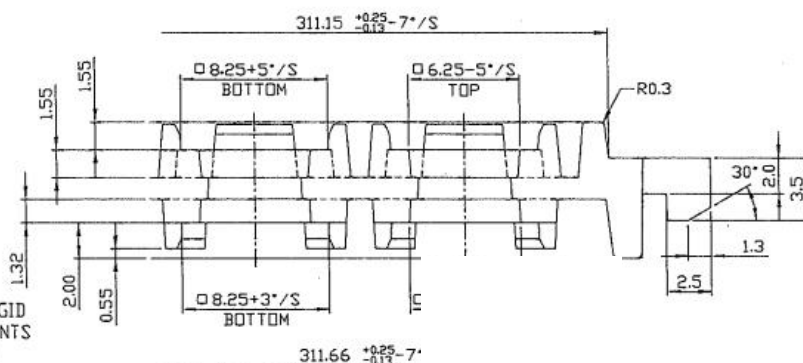
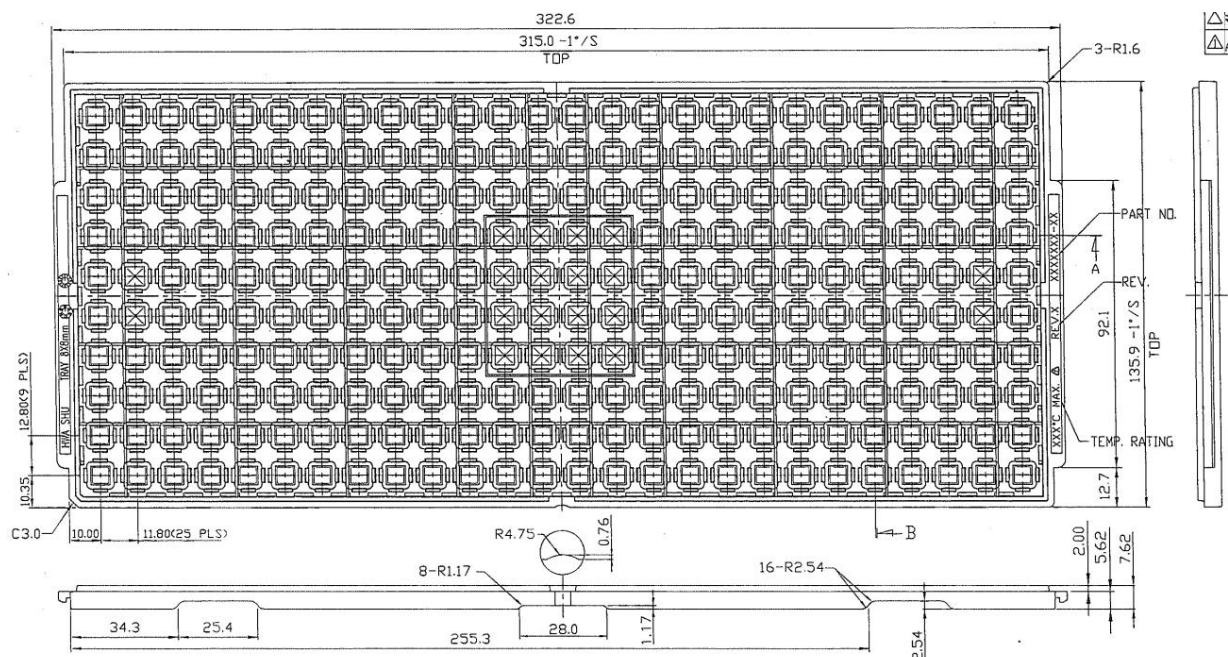
7. Package

7.1 DFN8x8

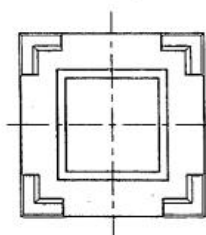
Dimensions(mm)			
Symbol	Min.	Nom.	Max.
A	0.80	0.90	1.00
A1	REF 0.203		
b	0.95	1.00	1.05
D	7.90	8.00	8.10
D1	6.90	7.00	7.10
E	7.90	8.00	8.10
E1	3.10	3.20	3.30
e	REF 2.00		
k	REF 2.80		
L	0.45	0.50	0.55



8. Product packaging



SECTION A (4/1)



NOTES :

1. (S.R. OHM/SQ.) MEANS SURFACE ELECTRIC RESISTIVITY OF THE TRAY.
2. THE MOLDED TRAY'S MATERIAL SHALL BE RIGID ENOUGH TO AVOID DAMAGE TO THE COMPONENTS DURING HANDLING, LOADING, BACKING, TESTING, SHIPPING AND PLACING.
3. TRAYS ARE STACKABLE WITHOUT INTERFERENCE AND WILL NOT STICK TOGETHER DURING UNSTACKING OPERATION.
4. WARPAGE IS WITHIN 0.76 mm.
5. THE CELLS MARKED WITH CROSS SYMBOL ARE FOR VACUUM PICKUP AREA AND WITHOUT THRU HOLES.
6. TOTAL USABLE CELLS 10X26=260.
7. ALL DIMENSIONS ARE IN MILLIMETERS.

