



UGN65R150

Advance

POWER MOSFET

CASCODE GALLIUM NITRIDE (GaN) HEMT POWER TRANSISTOR

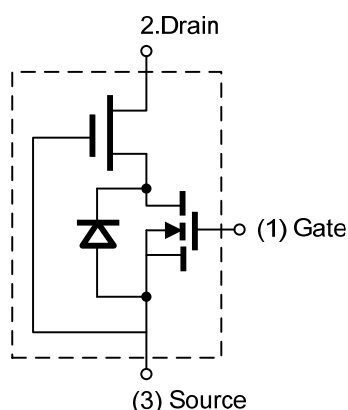
DESCRIPTION

The UTC **UGN65R150** is a cascaded 650V normally-on GaN HEMT in series with a low-voltage NMOSFET. The Provides high breakdown voltage, high current and high operating speed which is suitable for high power applications.

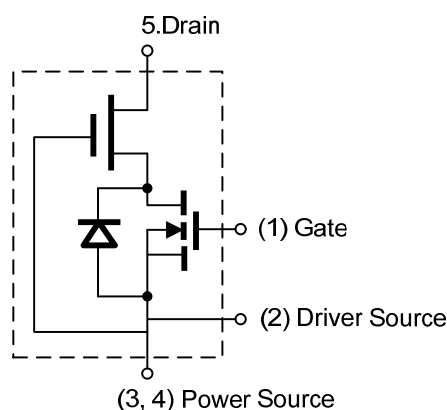
FEATURES

- * $R_{DS(ON)} \leq 178 \text{ m}\Omega @ V_{GS}=10V, I_D=5.0A$
- * 650V enhancement mode power transistor
- * High operating frequency

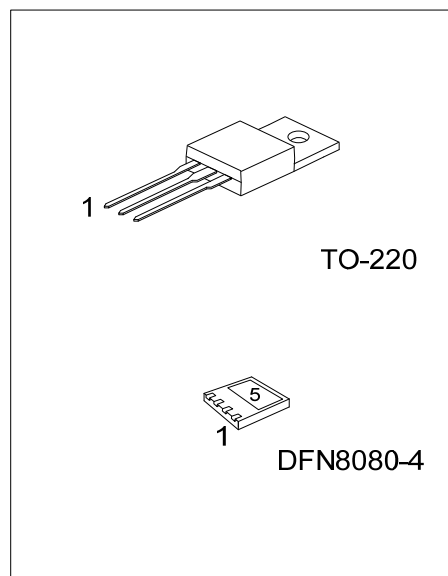
SYMBOL



TO-220



DFN8080-4



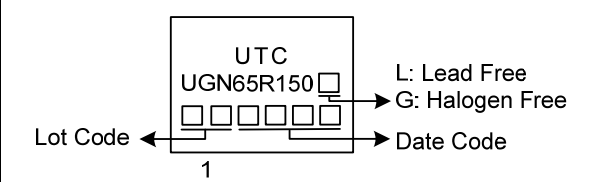
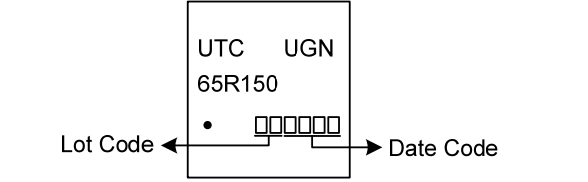
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment									Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	9	
UGN65R150L-TA3-R	UGN65R150G-TA3-R	TO-220	G	S	D	-	-	-	-	-	-	Tube
UGN65R150L-K04-8080-R	UGN65R150G-K04-8080-R	DFN8080-4	S	S	S	G	D	D	D	D	S	Tape Reel

Note: Pin Assignment: G: Gate D: Drain S: Source

UGN65R150G-TA3-T		(1)Packing Type	(1) T: Tube, R: Tape Reel
		(2)Package Type	(2) TA3: TO-220, K04-8080: DFN8080-4
		(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-220	DFN8080-4
 <p>Diagram of TO-220 marking: A rectangular package with 'UTC' and 'UGN65R150' printed on the top. Below the part number is a small square. To the left of the package is 'Lot Code' with an arrow pointing to a box containing five squares. To the right is 'Date Code' with an arrow pointing to a box containing five squares. Below the lot code box is a small square with the number '1'.</p> <p>UTC UGN65R150</p> <p>Lot Code → [] → Date Code</p> <p>1</p> <p>L: Lead Free G: Halogen Free</p>	 <p>Diagram of DFN8080-4 marking: A rectangular package with 'UTC UGN' and '65R150' printed on the top. Below the part number is a small square. To the left of the package is 'Lot Code' with an arrow pointing to a box containing five squares. To the right is 'Date Code' with an arrow pointing to a box containing five squares.</p> <p>UTC UGN 65R150</p> <p>Lot Code → [] → Date Code</p>

■ ABSOLUTE MAXIMUM RATING ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DS}	650	V
Transient Drain to Source Voltage (Note 2)			$V_{(TR)DS}$	>700	V
Gate-Source Voltage			V_{GS}	-20 ~ +20	V
Drain Current	Continuous	$T_C=25^{\circ}\text{C}$	I_D	14.9	A
		$T_C=100^{\circ}\text{C}$		10.1	A
	pulse width:10 μs (Note 3)		I_{DM}	55.7	A
Power Dissipation		TO-220	P_D	125	W
		DFN8080-4		74	W
Junction Temperature			T_J	-55 ~ +150	$^{\circ}\text{C}$
Storage Temperature Range			T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. In off-state, spike duty cycle $D < 0.01$, spike duration $< 1\mu\text{s}$.

3. Defined by product design and characterization. Value is not tested to full current in production.

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	$^{\circ}\text{C/W}$
	DFN8080-4		35 (Note)	$^{\circ}\text{C/W}$
Junction to Case	TO-220	θ_{JC}	0.97	$^{\circ}\text{C/W}$
	DFN8080-4		1.68 (Note)	$^{\circ}\text{C/W}$

Note: Device mounted on FR-4 substrate P_c board, 2oz copper, with 1inch square copper plate.

■ ELECTRICAL CHARACTERISTICS ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =100μA, V _{GS} =0V	650			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V			28	μA
		V _{DS} =650V, V _{GS} =0V, T _J =150°C			100	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =20V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =1mA		1.8	3.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =5.0A		145	178	mΩ
		V _{GS} =10V, I _D =5.0A, T _J =125°C		294		mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =400V, V _{GS} =0V, f=1.0MHz		825		pF
Output Capacitance	C _{OSS}			21.6		pF
Reverse Transfer Capacitance	C _{RSS}			3.85		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =400V, V _{GS} =0~10V, I _D =5.0A		8.6		nC
Gate to Source Charge	Q _{GS}			2.7		nC
Output charge	Q _{OSS}	V _{DS} =0~400V, V _{GS} =0V		32.8		nC
Turn-On Delay Time	t _{D(ON)}	V _{DS} =400V, V _{GS} =0~10V,		10		ns
Turn-Off Delay Time	t _{D(OFF)}	I _{DS} =2.0A, R _G =25Ω		20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Reverse Recovery Charge	Q _{rr}	V _{DS} =400V, I _D =5.0A		48		μC

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