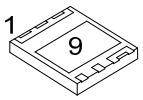
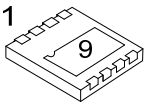
UGN65R360

POWER MOSFET

GALLIUM NITRIDE (GaN) ENHANCEMENT-MODE POWER TRANSISTOR



PDFN5×6



DFN8080-8

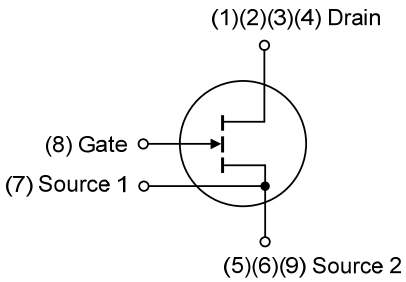
■ DESCRIPTION

The UTC **UGN65R360** is a gallium nitride (GaN) FETs with integrated gate drivers and GaN power devices offers the most efficient GaN solution with lifetime reliability and cost advantages. GaN transistors switch much faster than silicon MOSFETs, offering the potential to achieve lower-switching losses.

■ FEATURES

* $R_{DS(ON)}$ ≤ 480 mΩ @ V_{GS}=6.0V, I_D=2.0A
* High BV_{DSS} (>650V) Rating for Power Application
* Low Input Capacitance; Low FOM
* No reverse recovery charge
* Reverse conduction capability

■ SYMBOL



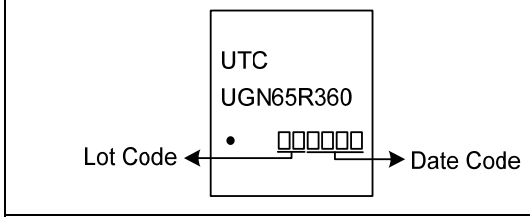
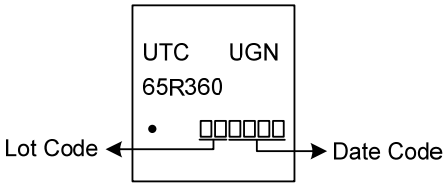
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment									Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	9	
UGN65R360L-K08-8080-R	UGN65R360G-K08-8080-R	DFN8080-8	D	D	D	D	S2	S2	S1	G	S2	Tape Reel
UGN65R360L-P5060-R	UGN65R360G-P5060-R	PDFN5×6	D	D	D	D	S2	S2	S1	G	S2	Tape Reel

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

UGN65R360G-K08-8080-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) K08-8080: DFN8080-8, P5060: PDFN5×6 (3) G: Halogen Free and Lead Free L: Lead Free

■ MARKING

DFN8080-8	PDFN5×6
	

■ ABSOLUTE MAXIMUM RATING (T_C=25°C, unless otherwise specified)

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	650	V
Gate-Source Voltage			V_{GSS}	-7 ~ +7	V
Gate-Source Voltage Pulsed				-20 ~ +10	V
Drain Current	Continuous	T_C=25°C	I_D	4.3	A
		T_C=100°C		2.8	A
	Pulsed (Note 2)		I_{DM}	8.6	A
Power Dissipation	DFN8080-8		P_D	60	W
	PDFN5×6			40.3	W
Junction Temperature			T_J	+150	°C
Storage Temperature Range			T_{STG}	-20 ~ +150	°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. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. $V_{DS(Transient)}$ is intended for surge rating during non-repetitive events, t_{Pulse} < 1μs.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	DFN8080-8	θ_{JA}	38	°C/W
	PDFN5×6		62.3	°C/W
Junction to Case	DFN8080-8	θ_{JC}	2.08	°C/W
	PDFN5×6		3.1	°C/W

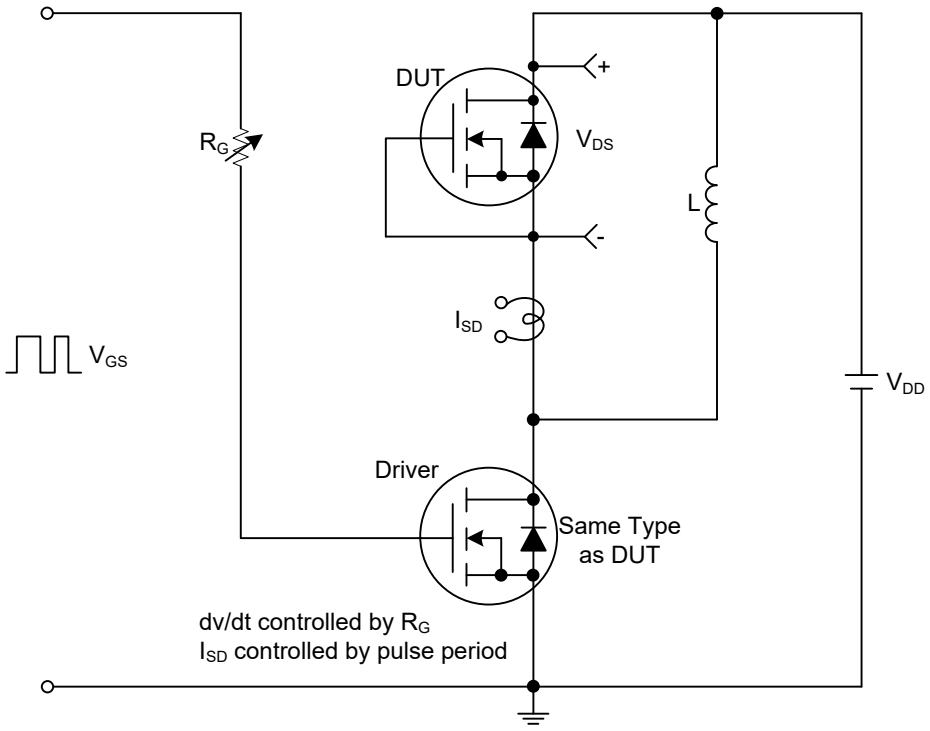
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

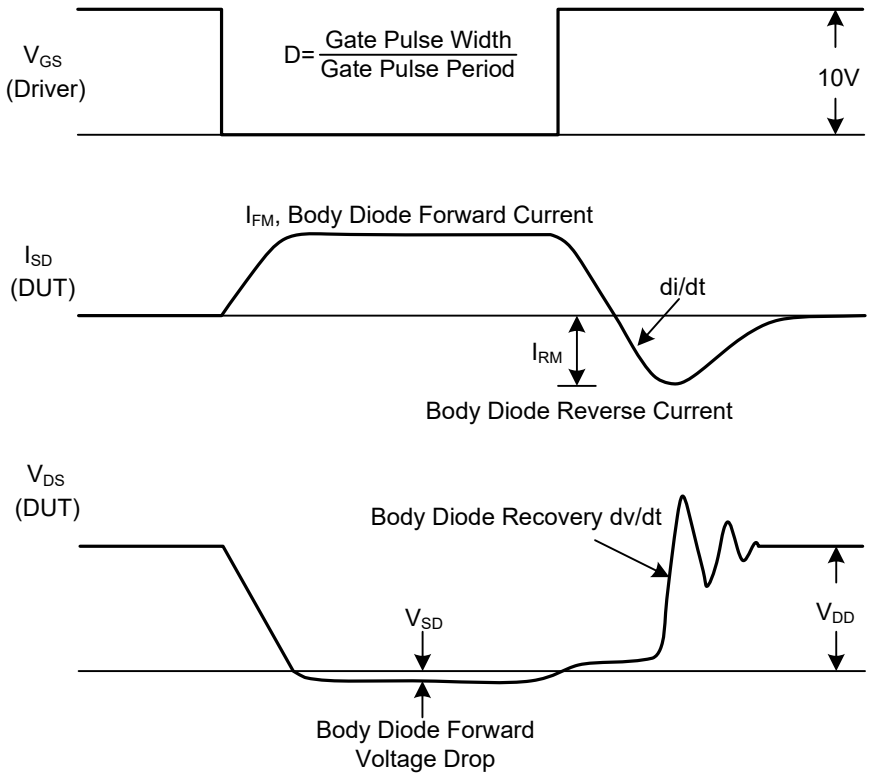
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=10μA, V_{GS}=0V	650			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V			10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=6V, V_{DS}=0V		200		μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=2.1mA	1.4	2.1	3.2	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=6.0V, I_D=2.0A		360	480	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=400V, V_{GS}=0V, f=1.0MHz		59		pF
Output Capacitance	C_{OSS}			16		pF
Reverse Transfer Capacitance	C_{RSS}			0.9		pF
Gate Resistance	R_G	f=1.0MHz, Open Drain		4.9		Ω
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q_G	V_{DS}=400V, V_{GS}=0~6V, I_D=2.0A		1.6		nC
Gate to Source Charge	Q_{GS}			0.3		nC
Gate to Drain Charge	Q_{GD}			0.8		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				4.3	A
Maximum Body-Diode Pulsed Current	I_{SM}				8.6	A
Source Drain Voltage Body Diode Forward Voltage	V_{SD}	I_{SD}=2.0A, V_{GS}=0V		3.2		V

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS



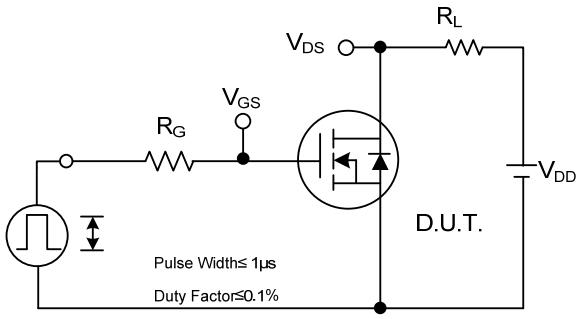
Peak Diode Recovery dv/dt Test Circuit



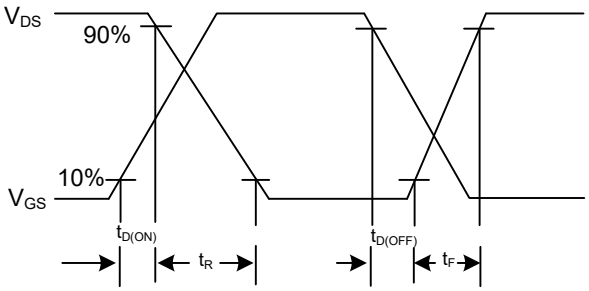
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

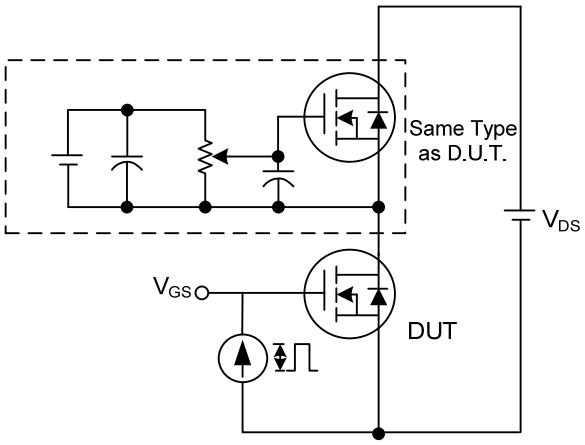
■ TEST CIRCUITS AND WAVEFORMS



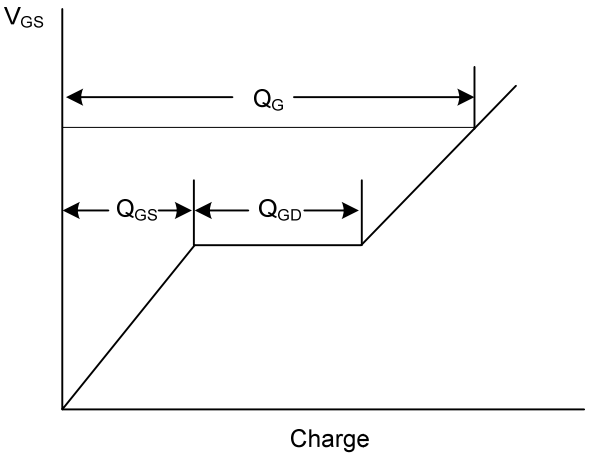
Switching Test Circuit



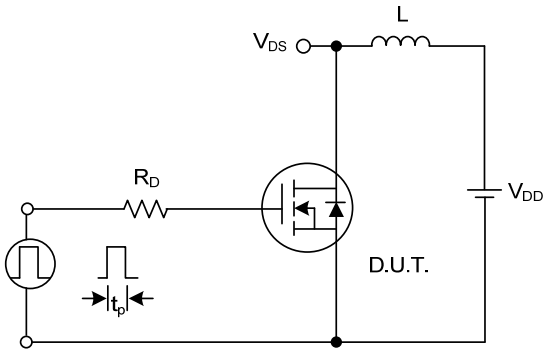
Switching Waveforms



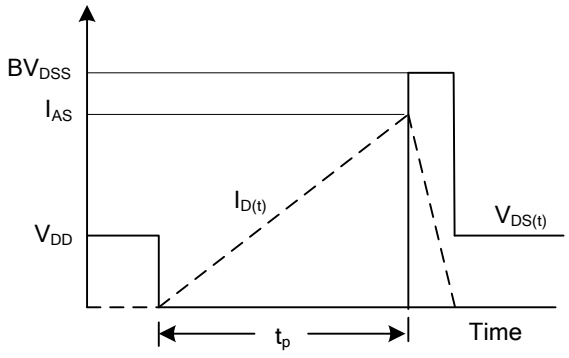
Gate Charge Test Circuit



Gate Charge Waveform

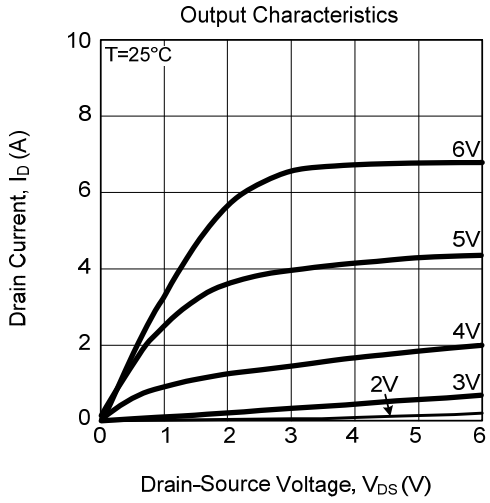


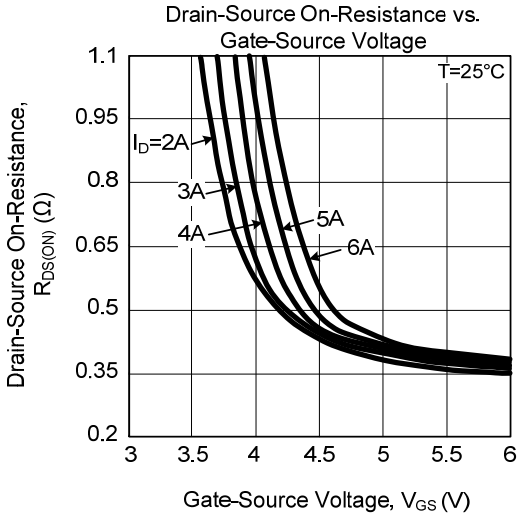
Unclamped Inductive Switching Test Circuit

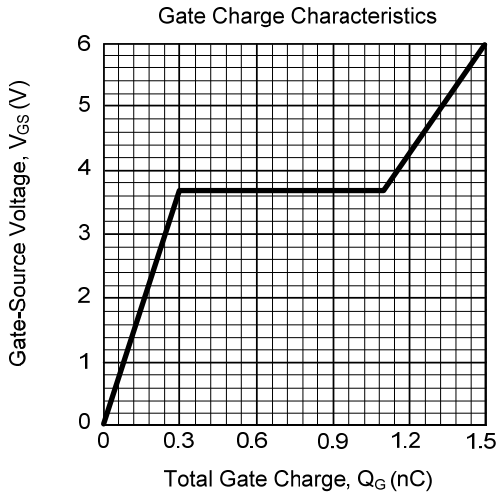


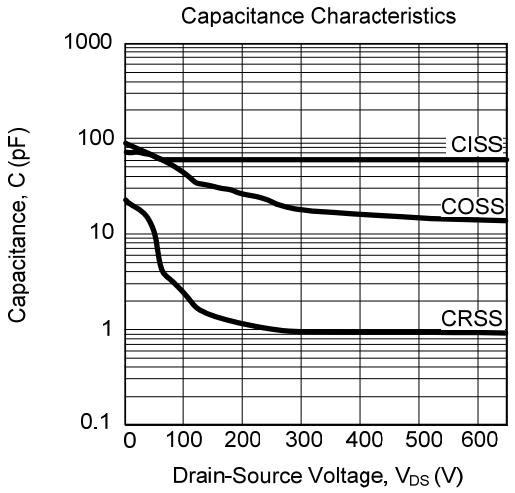
Unclamped Inductive Switching Waveforms

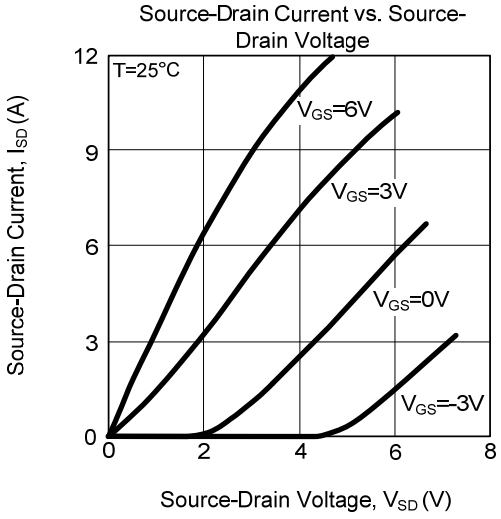
■ TYPICAL CHARACTERISTICS

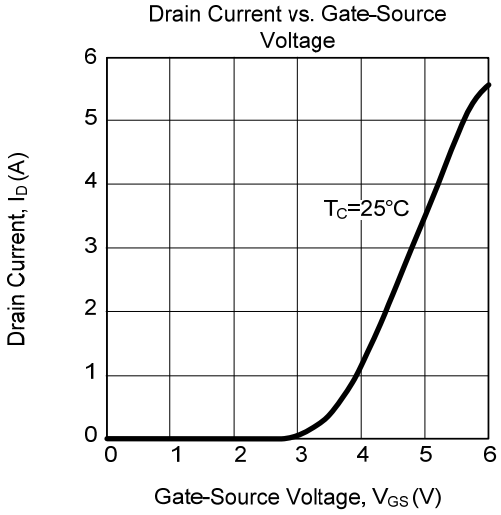












■ TYPICAL CHARACTERISTICS (Cont.)