



6NM65-FDQ

Power MOSFET

6A, 650V N-CHANNEL SUPER-JUNCTION MOSFET

DESCRIPTION

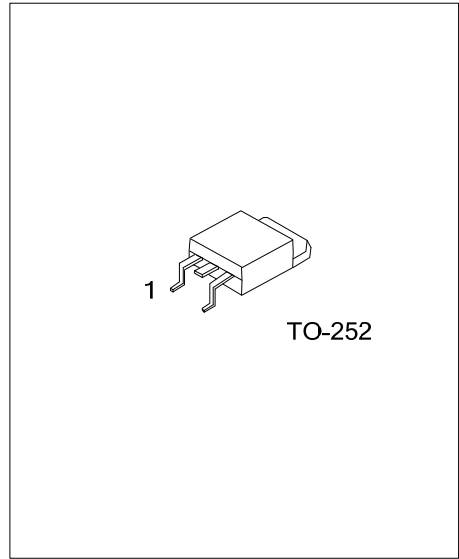
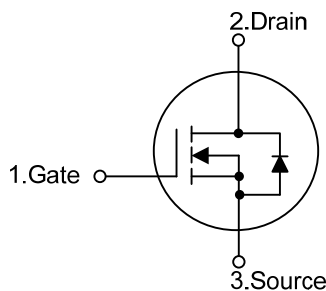
The UTC **6NM65-FDQ** is a Super Junction MOSFET Structure. It uses UTC advanced planar stripe, DMOS technology to provide customers perfect switching performance, minimal on-state resistance.

The UTC **6NM65-FDQ** is universally applied in electronic lamp ballasts based on half bridge topology, high efficiency switched mode power supplies, active power factor correction, etc.

FEATURES

- * $R_{DS(on)} < 1.2 \Omega$ @ $V_{GS}=10V$, $I_D=3.0A$
- * Improved dv/dt capability
- * Fast switching
- * 100% avalanche tested

SYMBOL



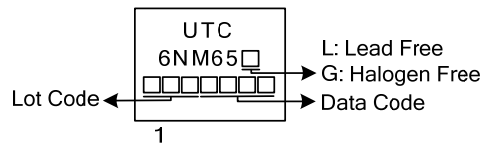
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
6NM65L-TN3-R	6NM65G-TN3-R	TO-252	G	D	S	Tape Reel

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

6NM65G-TN3-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) TN3: TO-252
	(3)Green Package	(3) G: Halogen Free and Lead Free L: Lead Free

MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	650	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	Continuous	I_D	6	A
	Pulsed (Note 2)	I_{DM}	18	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	200	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	8	V/ns
Power Dissipation		P_D	55	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		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. Repetitive Rating : Pulse width limited by maximum junction temperature.

3. $L=100\text{mH}$, $I_{AS}=2.0\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\ \Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD}\leq 6.0\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq V_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	110	$^\circ\text{C}/\text{W}$
Junction to Case		θ_{JC}	2.27	$^\circ\text{C}/\text{W}$

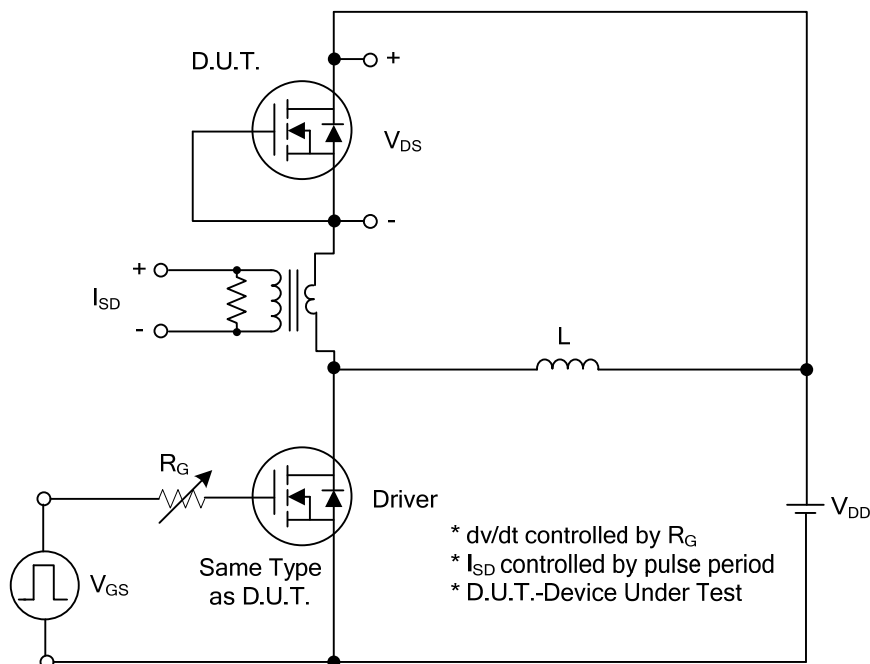
■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} = 0V, I _D = 250μA	650			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} = 650V, V _{GS} = 0V			10	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} = 30V, V _{DS} = 0V			100	nA
	Reverse		V _{GS} = -30V, V _{DS} = 0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} = V _{GS} , I _D = 250μA	2.5		4.5	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} = 10V, I _D = 3.0A			1.2	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		340		pF
Output Capacitance		C _{OSS}			280		pF
Reverse Transfer Capacitance		C _{RSS}			30		pF
SWITCHING CHARACTERISTICS							
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =300V, V _{GS} =10 V, I _D =6.0A, R _G =25Ω (Note 1, 2)		1.2		nS
Rise Time		t _R			12		nS
Turn-OFF Delay Time		t _{D(OFF)}			33		nS
Fall-Time		t _F			19		nS
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS							
Maximum Body-Diode Continuous Current		I _S				6	A
Maximum Body-Diode Pulsed Current		I _{SM}				18	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =6.0A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =6.0A, V _{GS} =0V		160		nS
Body Diode Reverse Recovery Charge		Q _{rr}	di _F /dt=100A/μs		1		μC

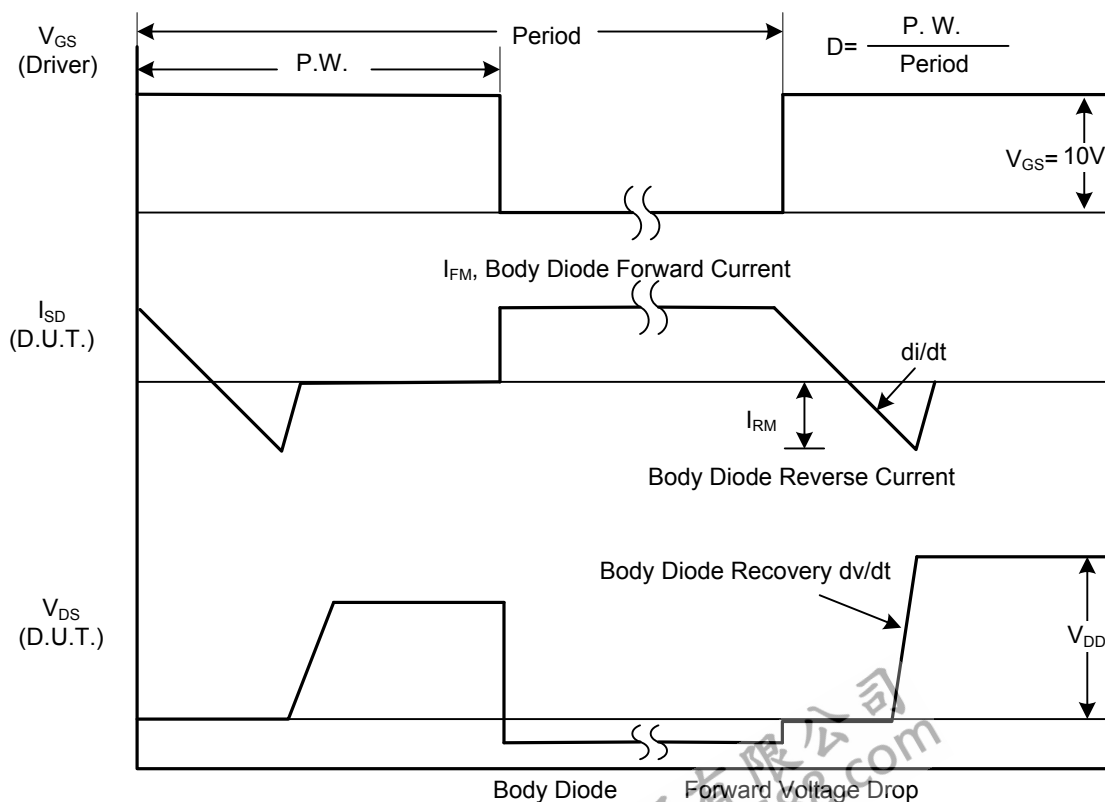
Notes: 1. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

2. Essentially independent of operating ambient temperature

■ TEST CIRCUITS AND WAVEFORMS

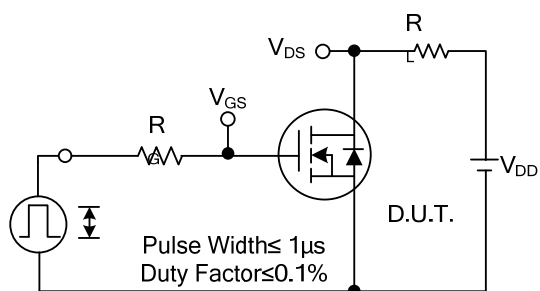


Peak Diode Recovery dv/dt Test Circuit

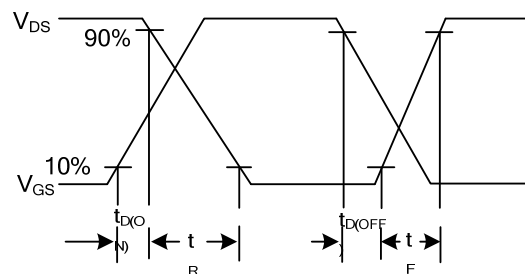


Peak Diode Recovery dv/dt Waveforms

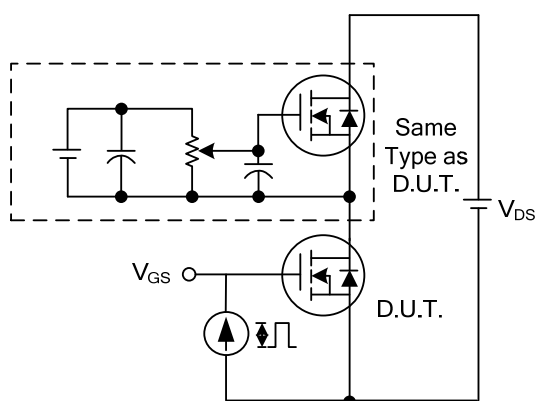
■ TEST CIRCUITS AND WAVEFORMS



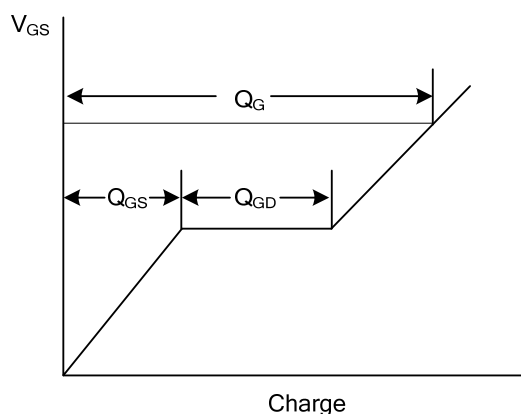
Switching Test Circuit



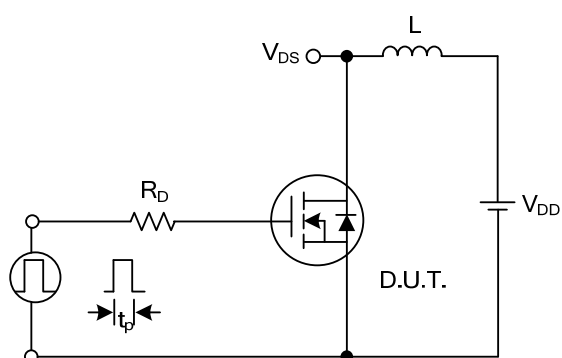
Switching Waveforms



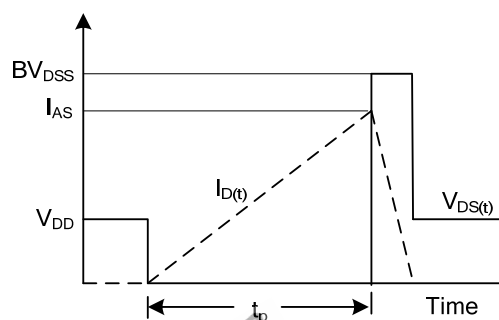
Gate Charge Test Circuit



Gate Charge Waveform

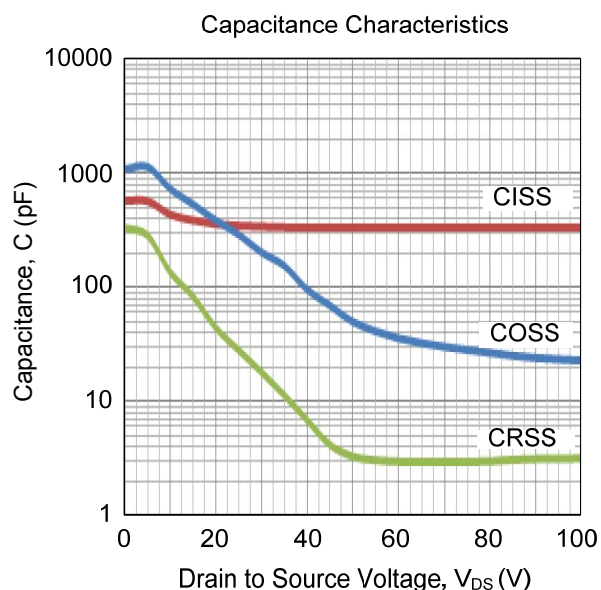


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS



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