

**10NM100**

Preliminary

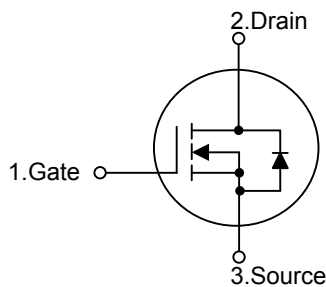
Power MOSFET**10A, 1000V N-CHANNEL
SUPER-JUNCTION MOSFET****DESCRIPTION**

The UTC **10NM100** is an Super Junction MOSFET Structure. It uses UTC advanced planar stripe, DMOS technology to provide customers perfect switching performance, minimal on-state resistance.

The UTC **10NM100** is universally applied in electronic lamp ballasts based on half bridge topology, high efficiency switched mode power supplies, active power factor correction, etc.

FEATURES

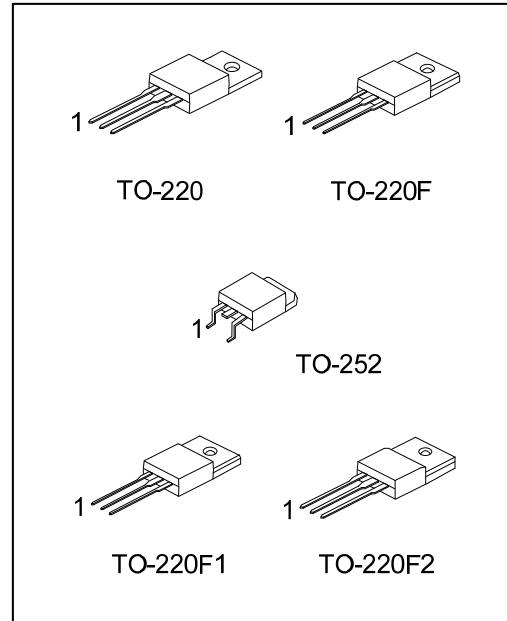
- * $R_{DS(ON)} \leq 0.9 \Omega$ @ $V_{GS}=10V$, $I_D=5.0A$
- * High switching speed
- * High breakdown voltage

SYMBOL**ORDERING INFORMATION**

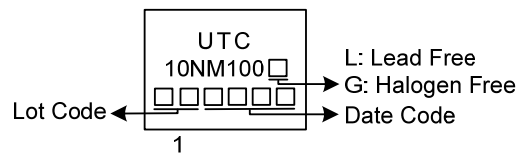
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
10NM100L-TA3-T	10NM100G-TA3-T	TO-220	G	D	S	Tube
10NM100L-TF1-T	10NM100G-TF1-T	TO-220F1	G	D	S	Tube
10NM100L-TF2-T	10NM100G-TF2-T	TO-220F2	G	D	S	Tube
10NM100L-TF3-T	10NM100G-TF3-T	TO-220F	G	D	S	Tube
10NM100L-TN3-R	10NM100G-TN3-R	TO-252	G	D	S	Tape Reel

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

10NM100G-TA3-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF1: TO-220F1, TF2: TO-220F2, TF3: TO-220F, TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	1000	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	Continuous	I_D	10	A
	Pulsed	I_{DM}	20	A
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	220	mJ
Power Dissipation	TO-220	P_D	100	W
	TO-220F/TO-220F1		28	W
	TO-220F2			
	TO-252		55	W
Junction Temperature		T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

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. $L=100\text{mH}$, $I_{AS}=2.1\text{A}$, $V_{DD}=120\text{V}$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$

4. $I_{SD} \leq 10\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^{\circ}\text{C}$

■ **THERMAL DATA**

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	TO-220F1/TO-220F2			
	TO-252		110	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	1.25	$^{\circ}\text{C}/\text{W}$
	TO-220F/TO-220F1		4.4	$^{\circ}\text{C}/\text{W}$
	TO-220F2			
	TO-252		2.27 (Note)	$^{\circ}\text{C}/\text{W}$

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

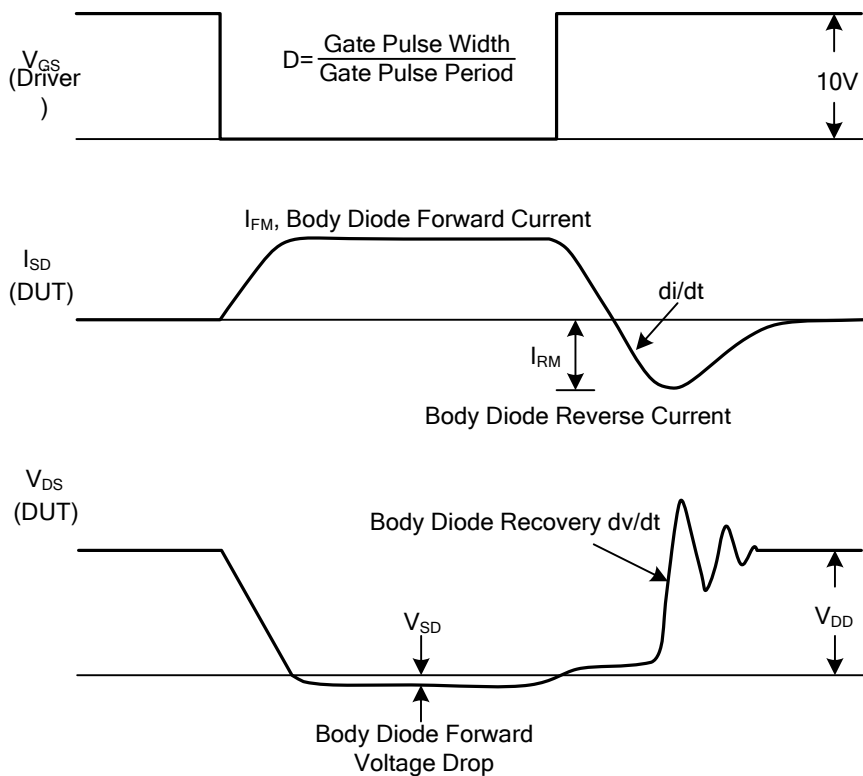
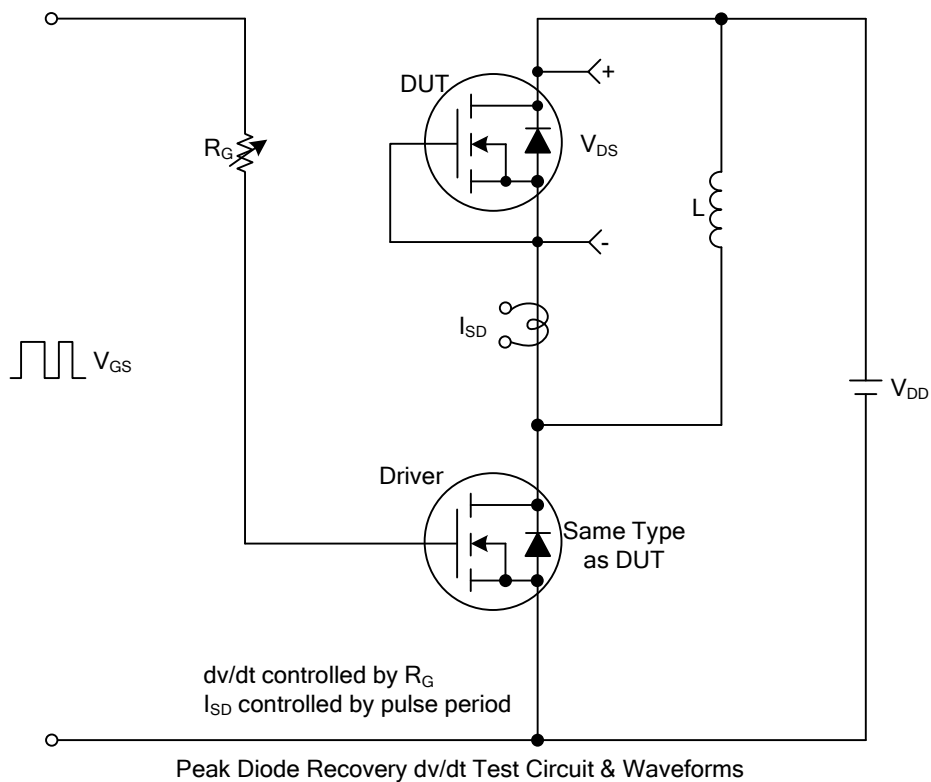
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =0.25mA, V _{GS} =0V, T _J =25°C	1000			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =1000V, V _{GS} =0V, T _J =25°C			10	μA
			V _{DS} =1000V, V _{GS} =0V, T _C =125°C			100	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 =5.0A			0.9	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =50V, f=1.0MHz		958		pF
Output Capacitance		C _{OSS}			54		pF
Reverse Transfer Capacitance		C _{RSS}			2.8		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =800V, V _{GS} =10V, I _D =10A, (Note 1,2)		44		nC
Gate to Source Charge		Q _{GS}			11		nC
Gate to Drain Charge		Q _{GD}			16		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =100V, V _{GS} =10V, I _D =10A, R _G =25Ω (Note 1,2)		14		ns
Rise Time		t _R			22		ns
Turn-OFF Delay Time		t _{D(OFF)}			170		ns
Fall-Time		t _F			80		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S	T _C =25°C			10	A
Maximum Body-Diode Pulsed Current		I _{SM}	T _C =25°C			20	A
Drain-Source Diode Forward Voltage		V _{SD}	I _F =10A, V _{GS} =0V			1.4	V
Reverse Recovery Time		t _{rr}	I _S =10A, V _{GS} =0V,		600		ns
Reverse Recovery Charge		Q _{rr}	dI _F /dt=100A/μs (Note 1)		8.6		μC

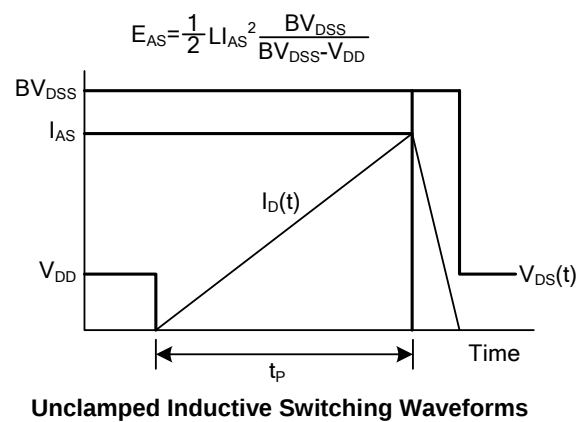
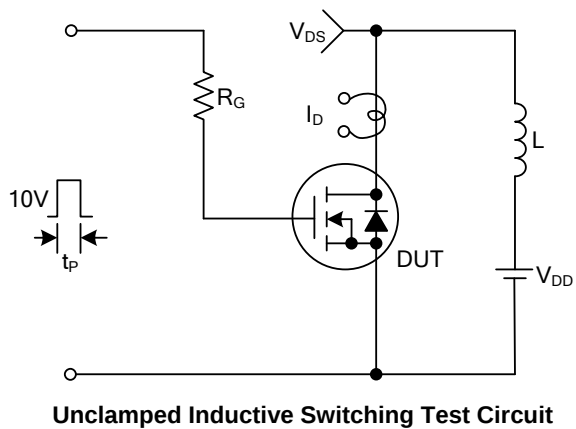
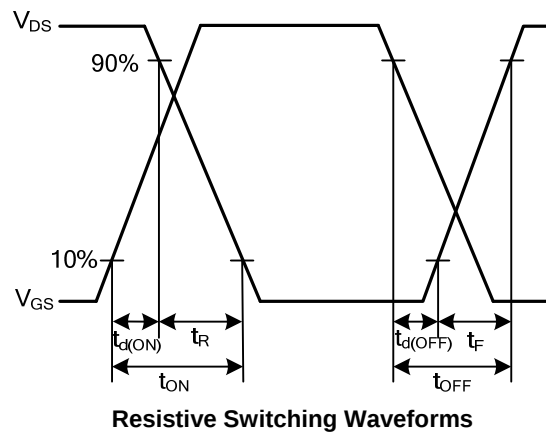
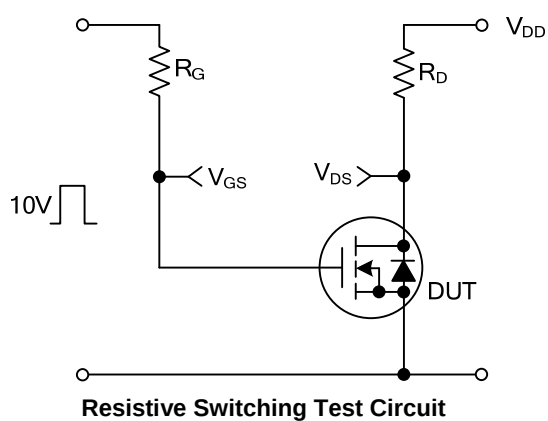
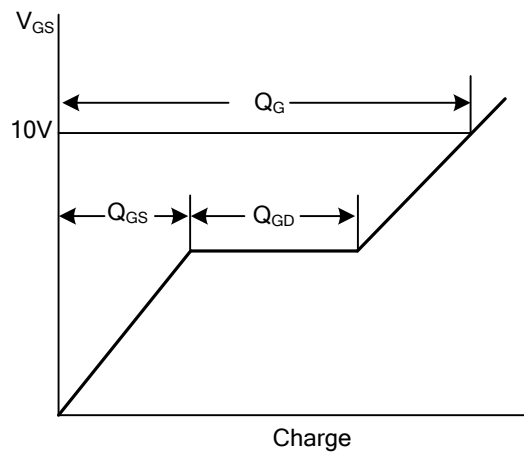
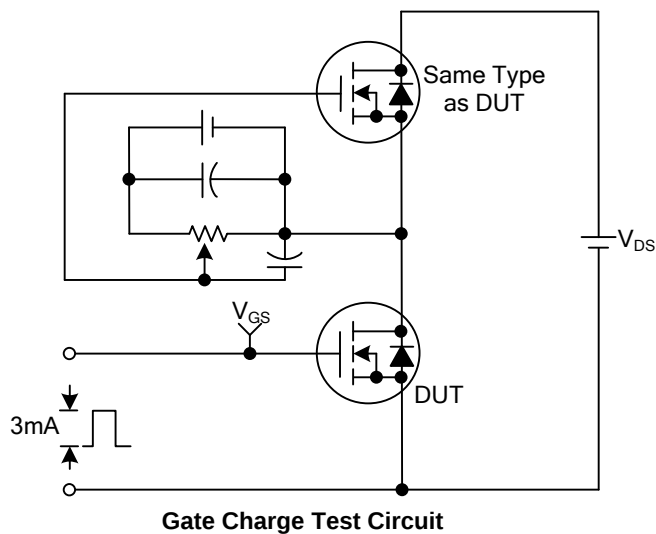
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



■ TEST CIRCUITS AND WAVEFORMS(Cont.)



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