



10NM70-FD2

Power MOSFET

**10A, 700V N-CHANNEL
SUPER-JUNCTION MOSFET**

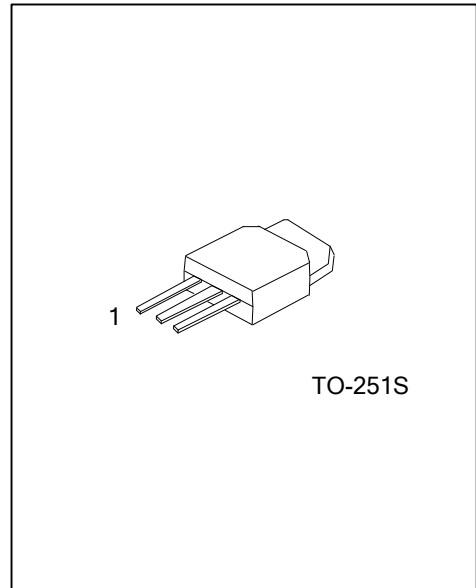
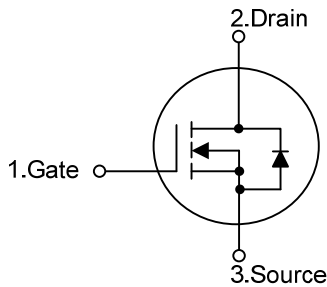
■ DESCRIPTION

The **UTC 10NM70-FD2** is a Super Junction MOSFET Structure and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and a high rugged avalanche characteristics. This power MOSFET is usually used at DC-DC, AC-DC converters for power applications.

■ FEATURES

- * $R_{DS(ON)} < 0.73\Omega @ V_{GS}=10V, I_D=5.0A$
- * By using Super Junction Structure
- * Fast Switching
- * With 100% Avalanche Tested

■ SYMBOL



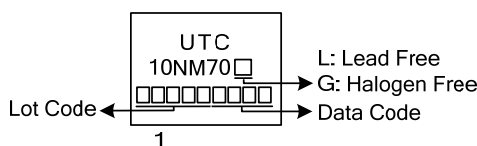
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
10NM70L-TMS-T	10NM70G-TMS-T	TO-251S	G	D	S	Tube

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

<p>10NM70G-TMS-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) T: Tube (2) TMS: TO-251S (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage		V _{DSS}	700	V
Gate to Source Voltage		V _{GSS}	±30	V
Continuous Drain Current	Continuous	I _D	10	A
Pulsed Drain Current	Pulsed (Note 2)	I _{DM}	40	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	256	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	9	V/ns
Power Dissipation		P _D	75	W
Junction Temperature		T _J	+150	°C
Storage Temperature		T _{STG}	-55 ~ +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. L=150mH, I_{AS}=1.85A, V_{DD}= 50V, R_G=25Ω, Starting T_J=25°C.

4. I_{SD}≤10A, di/dt ≤200A/μs, V_{DD} ≤BV_{DSS}, Starting T_J=25°C.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ _{JA}	110	°C/W
Junction to Case	θ _{JC}	1.67	°C/W

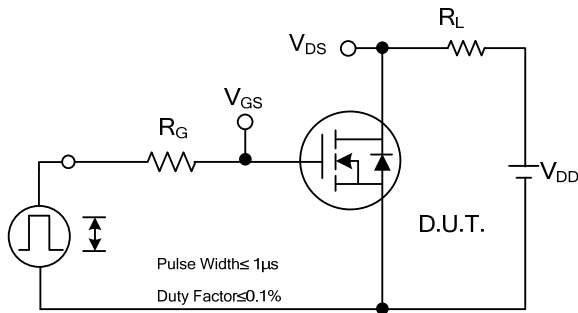
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	700			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =700V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±30V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D =250μA	2.5		4.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =5.0A			0.73	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		587		pF
Output Capacitance	C _{OSS}			423		pF
Reverse Transfer Capacitance	C _{RSS}			47		pF
SWITCHING PARAMETERS						
Total Gate Charge (Note 1)	Q _G	V _{DS} =400V, V _{GS} =10V, I _D =10A, I _G =10mA (Note 1, 2)		32.5		nC
Gate to Source Charge	Q _{GS}			11.5		nC
Gate to Drain Charge	Q _{GD}			12.5		nC
Turn-ON Delay Time (Note 1)	t _{D(ON)}	V _{DD} =350V, V _{GS} =10V, I _D =10A, R _G =25Ω (Note 1, 2)		10		ns
Rise Time	t _R			25		ns
Turn-OFF Delay Time	t _{D(OFF)}			65		ns
Fall-Time	t _F			36		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				10	A
Maximum Body-Diode Pulsed Current	I _{SM}				40	A
Drain-Source Diode Forward Voltage (Note 1)	V _{SD}	I _S =10A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time (Note 1)	t _{rr}	I _S =10A, V _{GS} =0V		300		ns
Body Diode Reverse Recovery Charge	Q _{rr}	di _F /dt=100A/μs		2		μC

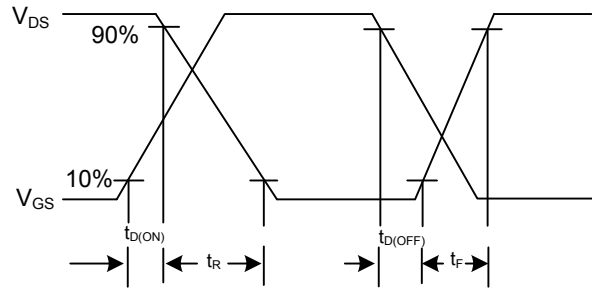
Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

2. Essentially independent of operating temperature

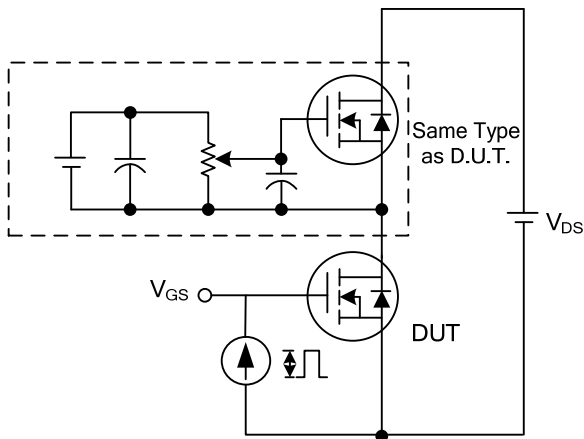
TEST CIRCUITS AND WAVEFORMS (Cont.)



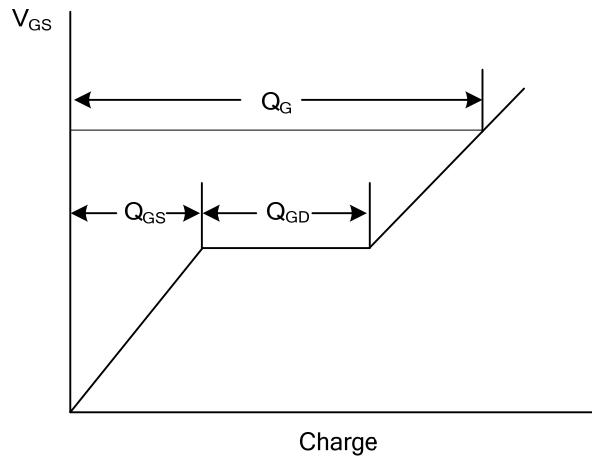
Switching Test Circuit



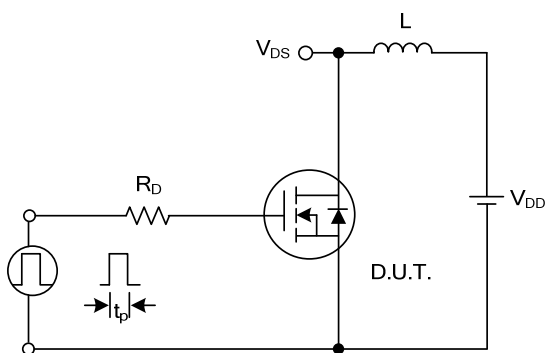
Switching Waveforms



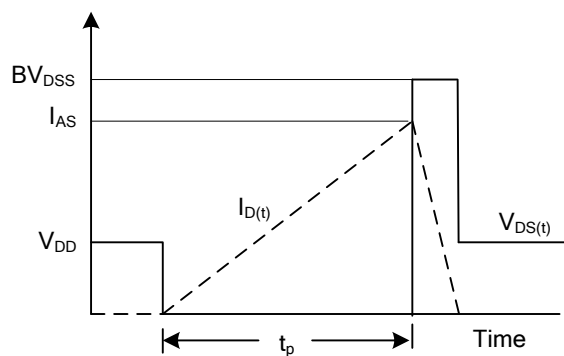
Gate Charge Test Circuit



Gate Charge Waveform

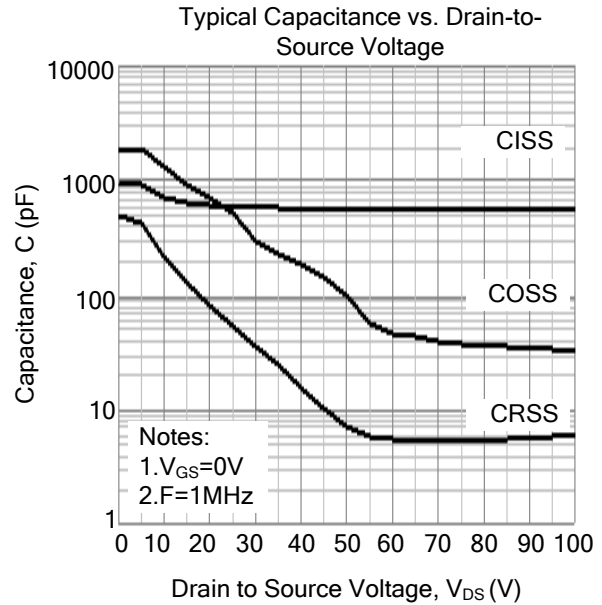
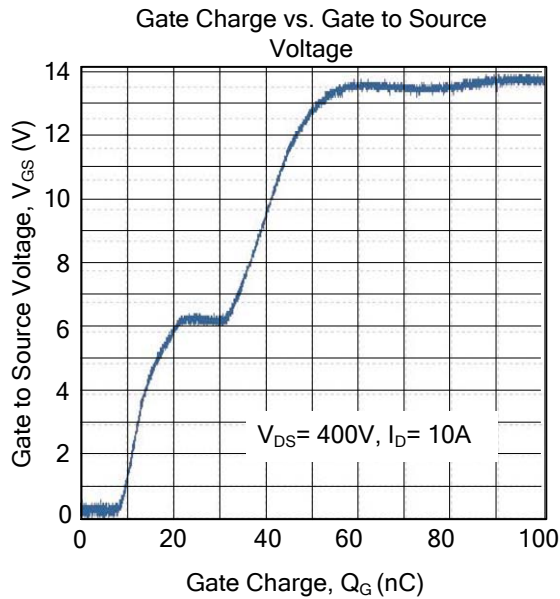


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.