



75NM60-F

Preliminary

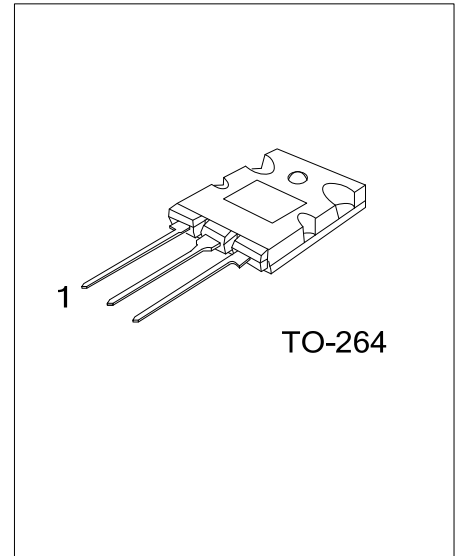
Power MOSFET

75A, 600V N-CHANNEL POWER MOSFET

DESCRIPTION

The UTC **75NM60-F** is a N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology allows a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

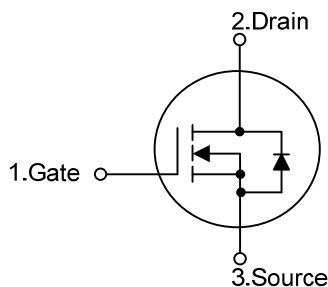
The UTC **75NM60-F** is generally applied in high efficiency switch mode power supplies.



FEATURES

- * $R_{DS(ON)} < 55m\Omega$ @ $V_{GS}=10V$, $I_D=37.5A$
- * Fast Switching
- * With 100% Avalanche Tested

SYMBOL



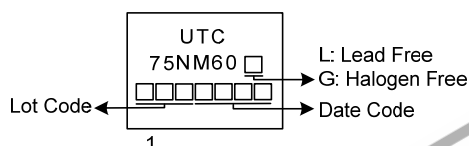
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
75NM60L-T64-T	75NM60G-T64-T	TO-264	G	D	S	Tube

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

75NM60G-T64-T	(1)Packing Type	(1) T: Tube
	(2)Package Type	(2) T64: TO-264
	(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}	600	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	Continuous	I_D	75	A
	Pulsed (Note 2)	I_{DM}	150	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	1188	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	15	V/ns
Power Dissipation		P_D	255	W
Junction Temperature		T_J	+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. Repetitive Rating : Pulse width limited by maximum junction temperature.

3. $L=5\text{mH}$, $I_{AS}=21.8\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$

4. $I_{SD}\leq 30\text{A}$, $di/dt\leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J=25^\circ\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	40	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	0.4	$^\circ\text{C}/\text{W}$

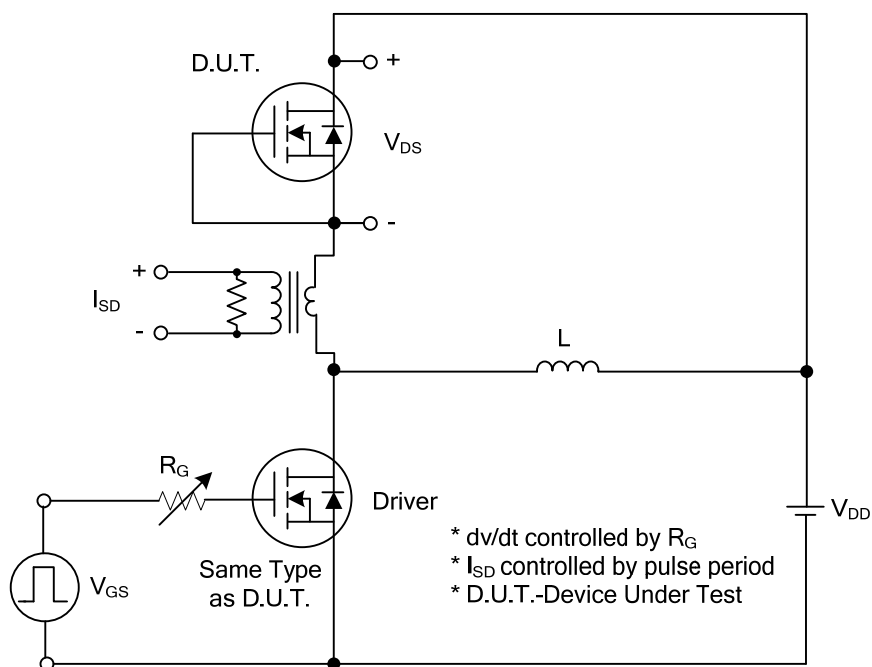
■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	600			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =600V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{DS} =0V, V _{GS} =30V			100	nA
	Reverse		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 =37.5A			55	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		4500		pF
Output Capacitance		C _{OSS}			2050		pF
Reverse Transfer Capacitance		C _{RSS}			3.7		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =300V, V _{GS} =10V, I _D =75A, I _G =1mA (Note 1, 2)		210		nC
Gate to Source Charge		Q _{GS}			50		nC
Gate to Drain Charge		Q _{GD}			92		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =300V, V _{GS} =10V, I _D =30A, R _G =25Ω (Note 1, 2)		96		ns
Rise Time		t _R			60		ns
Turn-OFF Delay Time		t _{D(OFF)}			680		ns
Fall-Time		t _F			224		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				75	A
Maximum Body-Diode Pulsed Current		I _{SM}				150	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =75A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time (Note 1)		t _{rr}	I _S =30A, V _{GS} =0V,		550		ns
Body Diode Reverse Recovery Charge		Q _{rr}	di _r /dt=100A/μs		12		μC

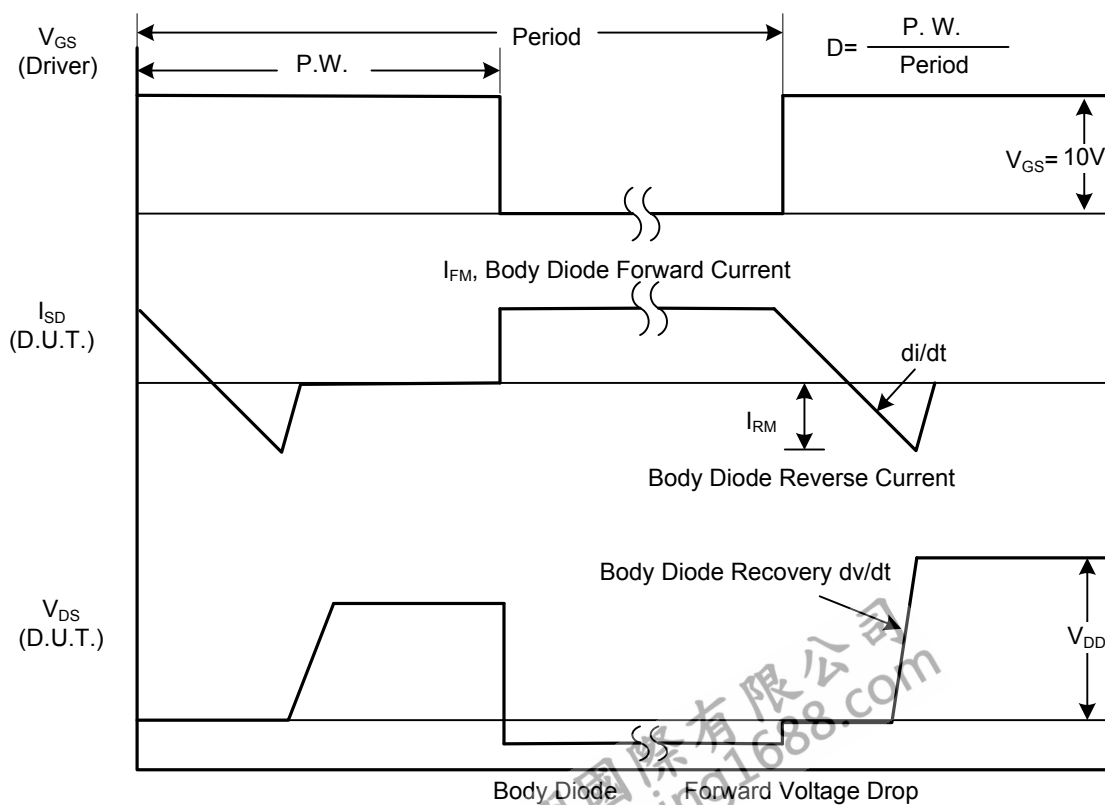
Notes: 1. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

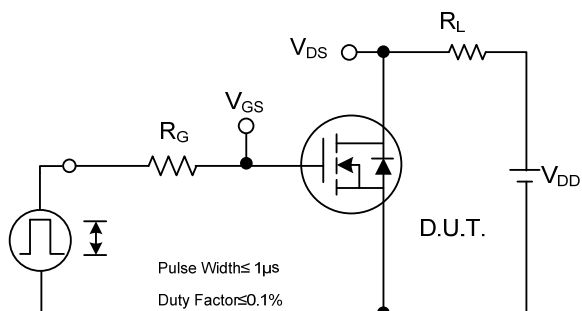


Peak Diode Recovery dv/dt Test Circuit

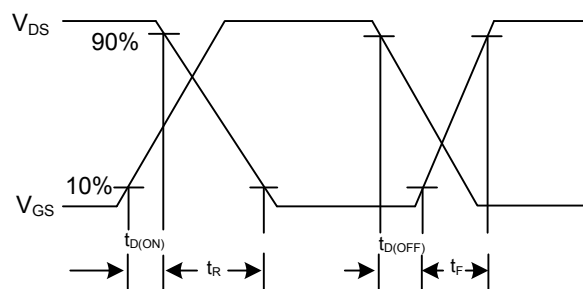


Peak Diode Recovery dv/dt Waveforms

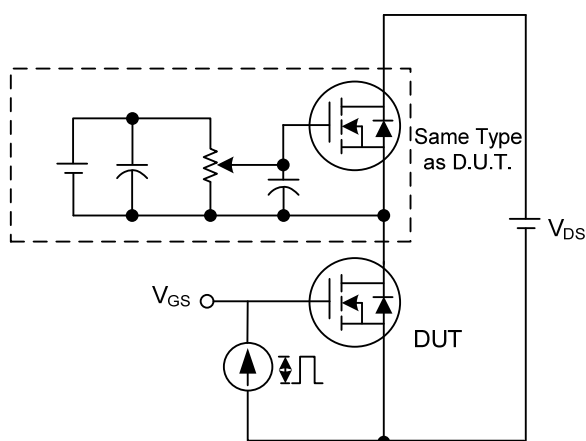
■ TEST CIRCUITS AND WAVEFORMS



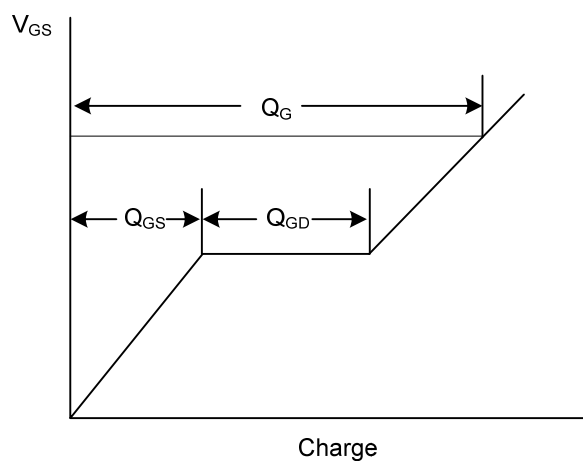
Switching Test Circuit



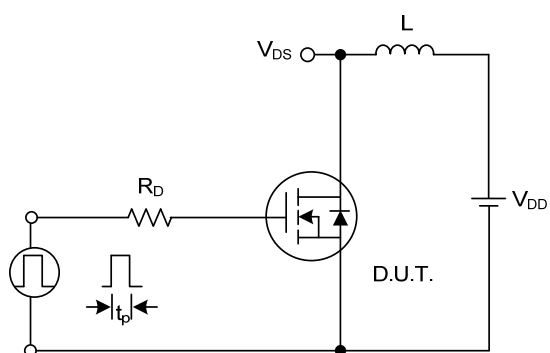
Switching Waveforms



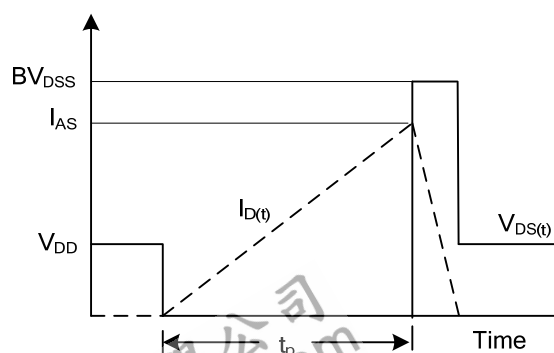
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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