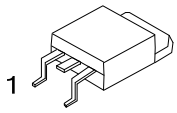
UT60N055

Power MOSFET

60A, 55V N-CHANNEL FAST SWITCHING MOSFET



TO-252

■ DESCRIPTION

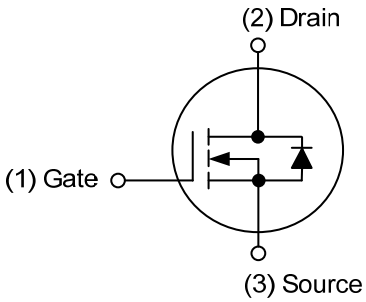
The UTC **UT60N055** is a N-Channel MOSFET, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, high switching speed and low gate charge.

The UTC **UT60N055** is suitable for application in networking DC-DC power system and LCD/LED back light, etc.

■ FEATURES

* $R_{DS(ON)} \leq 11\ m\Omega$ @ $V_{GS} = 10V$, $I_D = 30A$
  $R_{DS(ON)} \leq 15\ m\Omega$ @ $V_{GS} = 4.5V$, $I_D = 30A$
* Low gate charge
* High switching speed

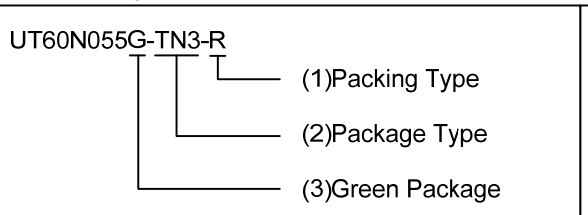
■ SYMBOL



■ ORDERING INFORMATION

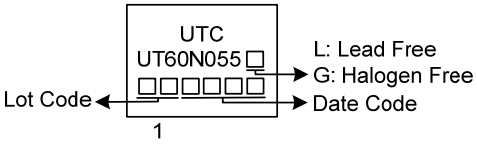
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT60N055L-TN3-T	UT60N055G-TN3-T	TO-252	G	D	S	Tape Reel

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



(1) R: Tape Reel
(2) TN3: TO-252
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	55	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	60	A
	Pulsed (Note 2)	I_{DM}	120	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	51	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2.7	V/ns
Power Dissipation (Note 4)		P_D	44	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=0.1mH, I_{AS}=32A, V_{DD}=25V, R_G=25 Ω, Starting T_J = 25°C
4. I_{SD} ≤ 30A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

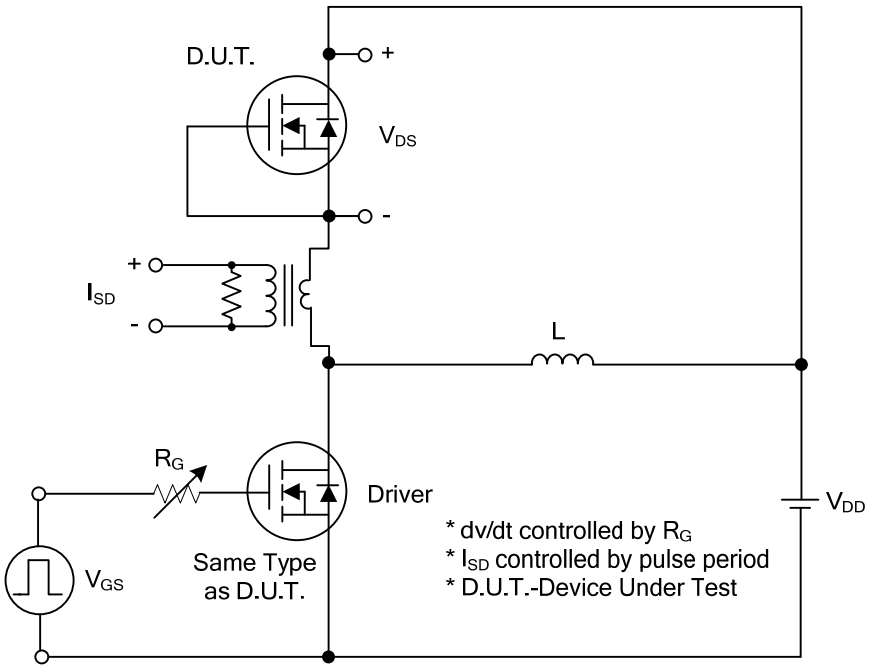
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	110	°C/W
Junction to Case	θ_{JC}	2.85	°C/W

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

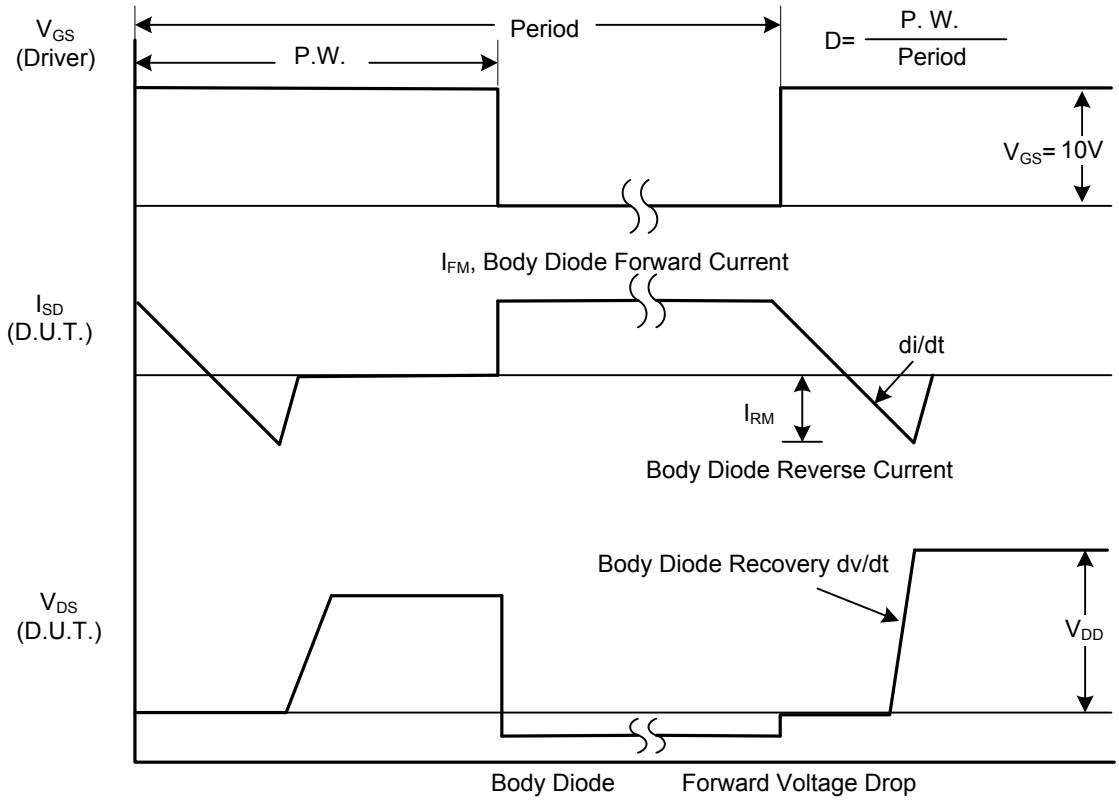
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	55			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=55V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0		3.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=30A			11	mΩ
			V_{GS}=4.5V, I_D=30A			15	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		2350		pF
Output Capacitance		C_{OSS}			235		pF
Reverse Transfer Capacitance		C_{RSS}			195		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q_G	V_{DS}=44V, V_{GS}=10V, I_D=60A		78		nC
Gate to Source Charge		Q_{GS}			10		nC
Gate to Drain Charge		Q_{GD}			26		nC
Turn-ON Delay Time (Note 1)		$t_{D(ON)}$	V_{DD}=30V, V_{GS}=0V, I_D=60A, R_G=3Ω		11		ns
Rise Time		t_R			19		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			50		ns
Fall-Time		t_F			24		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				60	A
Maximum Body-Diode Pulsed Current		I_{SM}				120	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_S=60A, V_{GS}=0V			1.4	V
Body Diode Reverse Recovery Time (Note 1)		t_{rr}	I_S=30A, V_{GS}=0V, dI_F/dt=100A/μs		46		nS
Body Diode Reverse Recovery Charge		Q_{rr}			25		nC

Notes: 1. The data tested by pulsed, pulse width≤300μs, duty cycle≤2%.
2. The power dissipation is limited by 150°C junction temperature.

■ TEST CIRCUITS AND WAVEFORMS

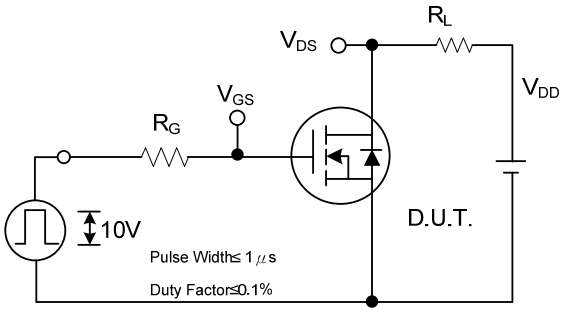


Peak Diode Recovery dv/dt Test Circuit

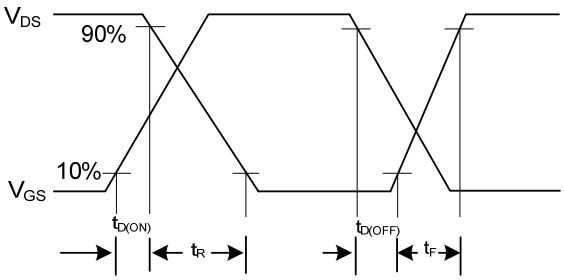


Peak Diode Recovery dv/dt Waveforms

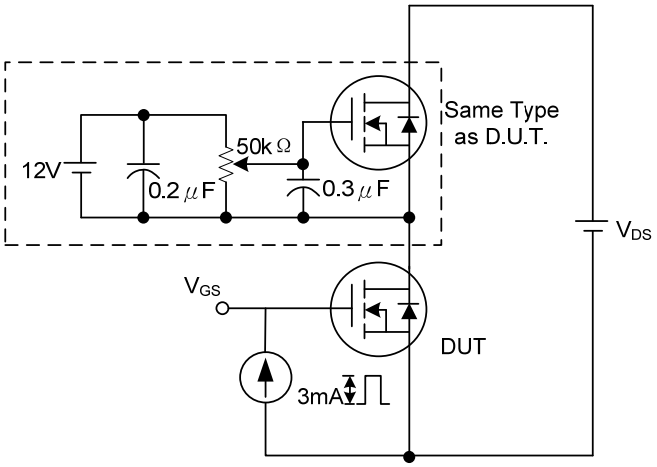
■ TEST CIRCUITS AND WAVEFORMS



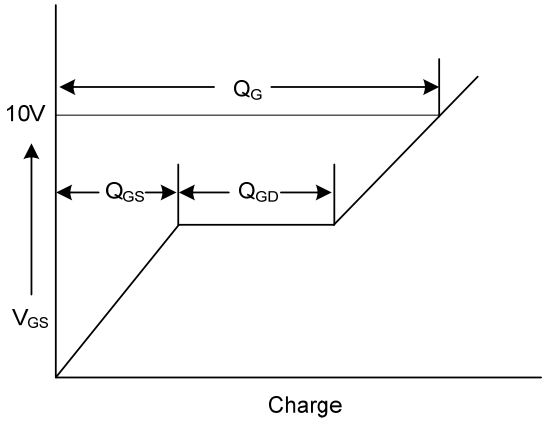
Switching Test Circuit



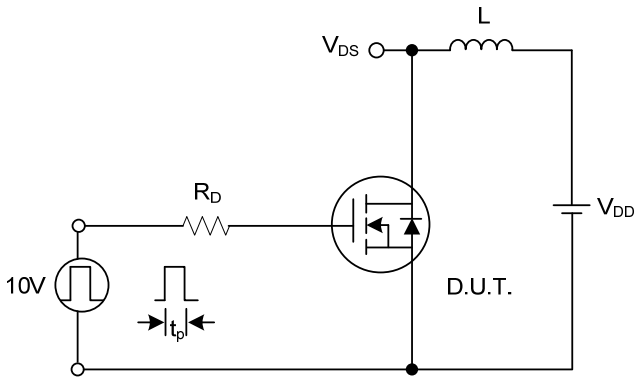
Switching Waveforms



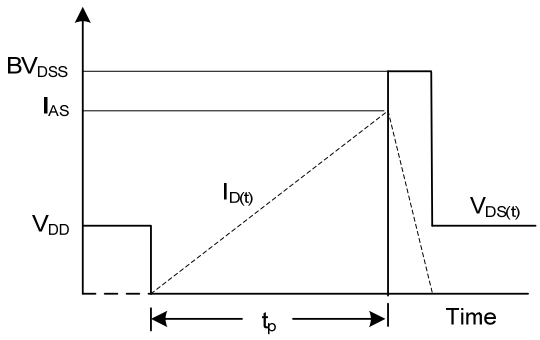
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS