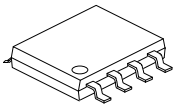
DUAL ENHANCEMENT MODE (N-CHANNEL / P-CHANNEL)



SOP-8

■ DESCRIPTION

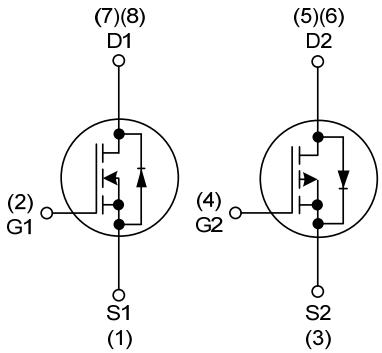
The UTC **F17NP055** incorporates a N-channel MOSFET and a P-channel MOSFET enhancement mode silicon gate power MOSFET with Fast Body Diode. is designed high voltage, high speed power switching applications such, is designed to have better characteristics. such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics.

This power MOSFET is usually used at high speed switching applications in power supplies, PWM motor controls, high efficient AC to DC converters and bridge circuits.

■ FEATURES

* N-CHANNEL: 55V/17A
  $R_{DS(on)}$ ≤ 44 mΩ @ V_{GS}=10V, I_D=8.5A
* P-CHANNEL: -55V/-17A
  $R_{DS(on)}$ ≤ 134 mΩ @ V_{GS}=-10V, I_D=-8.5A
* Fast body diode MOSFET technology
* High switching speed

■ SYMBOL



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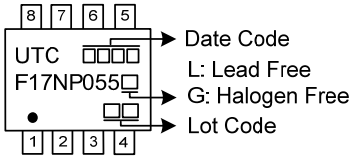
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
F17NP055L-S08-R	F17NP055G-S08-R	SOP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel

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

F17NP055G-S08-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) S08: SOP-8 (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
			N-CHANNEL	P-CHANNEL	
Drain-Source Voltage		V_{DSS}	55	-55	V
Gate-Source Voltage		V_{GSS}	±20	±20	V
Drain Current	Continuous	I_D	17	-17	A
	Pulsed (Note 1)	I_{DM}	34	-34	A
Avalanche Energy, Single Pulse (Note 3)		E_{AS}	73	63	mJ
Power Dissipation		P_D	1.9		W
Junction Temperature		T_J	-55 ~ +150		°C
Storage Temperature Range		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. N-Channel: L=0.1mH, I_{AS}=38.2A, V_{DD}=30V, R_G=25Ω, Starting T_J=25°C
P-Channel: L=0.1mH, I_{AS}=-35.7A, V_{DD}=-30V, R_G=25Ω, Starting T_J=25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	90	°C/W
Junction to Case	θ_{JC}	65.7	°C/W

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

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

N-Channel

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			+100	nA
	Reverse		V_{GS}=-20V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.0		4.0	V
Static Drain-Source On-State Resistance (Note 2)		$R_{DS(ON)}$	V_{GS}=10V, I_D=8.5A			44	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		702		pF
Output Capacitance		C_{OSS}			171		pF
Reverse Transfer Capacitance		C_{RSS}			31		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 2)		Q_G	V_{DS}=44V, V_{GS}=10V, I_D=17A, I_G=1mA (Note 1, 2)		25		nC
Gate to Source Charge		Q_{GS}			5		nC
Gate to Drain Charge		Q_{GD}			8		nC
Turn-ON Delay Time (Note 2)		$t_{D(ON)}$	V_{Ds}=27.5V, V_{GS}=10V, I_D=17A, R_G=6Ω (Note 1, 2)		6		ns
Rise Time		t_R			17		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			30		ns
Fall-Time		t_F			17		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Drain-Source Diode Forward Voltage(Note 2)		V_{SD}	I_S=17A, V_{GS}=0V			1.4	V

■ ELECTRICAL CHARACTERISTICS (Cont.)

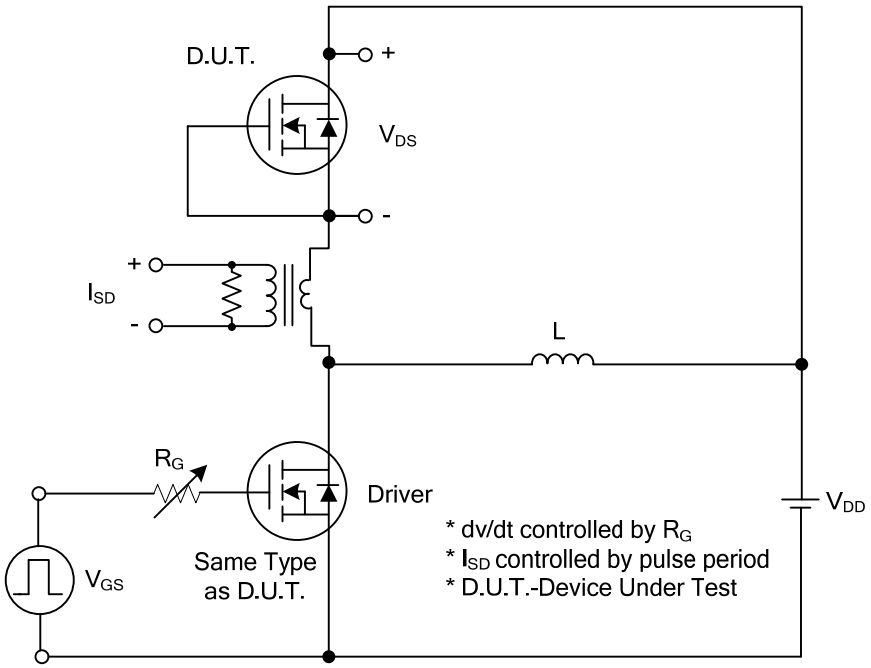
P-Channel

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			+100	nA
	Reverse		V_{GS}=-20V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-2.0		-4.0	V
Static Drain-Source On-State Resistance (Note 2)		$R_{DS(ON)}$	V_{GS}=-10V, I_D=-8.5A			134	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=-25V, f=1.0MHz		638		pF
Output Capacitance		C_{OSS}			178		pF
Reverse Transfer Capacitance		C_{RSS}			40		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 2)		Q_G	V_{DS}=-44V, V_{GS}=-10V, I_D=-17A, I_G=-1mA (Note 1, 2)		19		nC
Gate to Source Charge		Q_{GS}			7		nC
Gate to Drain Charge		Q_{GD}			6		nC
Turn-ON Delay Time (Note 2)		$t_{D(ON)}$	V_{DS}=-27.5V, V_{GS}=-10V, I_D=-17A, R_G=6Ω (Note 1, 2)		11		ns
Rise Time		t_R			17		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			22		ns
Fall-Time		t_F			17		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Drain-Source Diode Forward Voltage(Note 2)		V_{SD}	I_S=-17A, V_{GS}=0V			-2.0	V

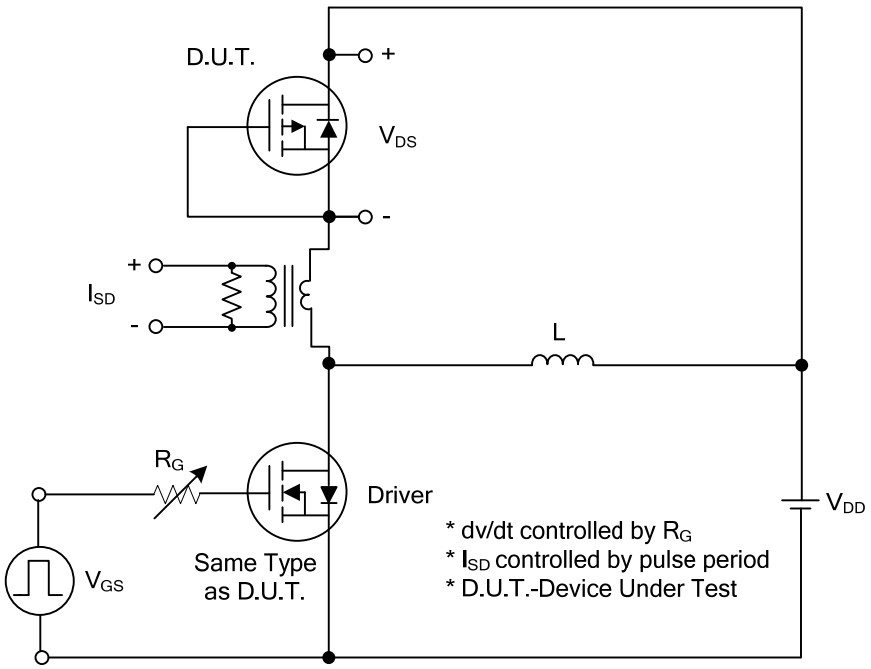
Notes: 1. Pulse width limited by maximum junction temperature
2. Pulse width ≤ 300μs, Duty cycle ≤ 2%

■ TEST CIRCUITS AND WAVEFORMS

N-CHANNEL

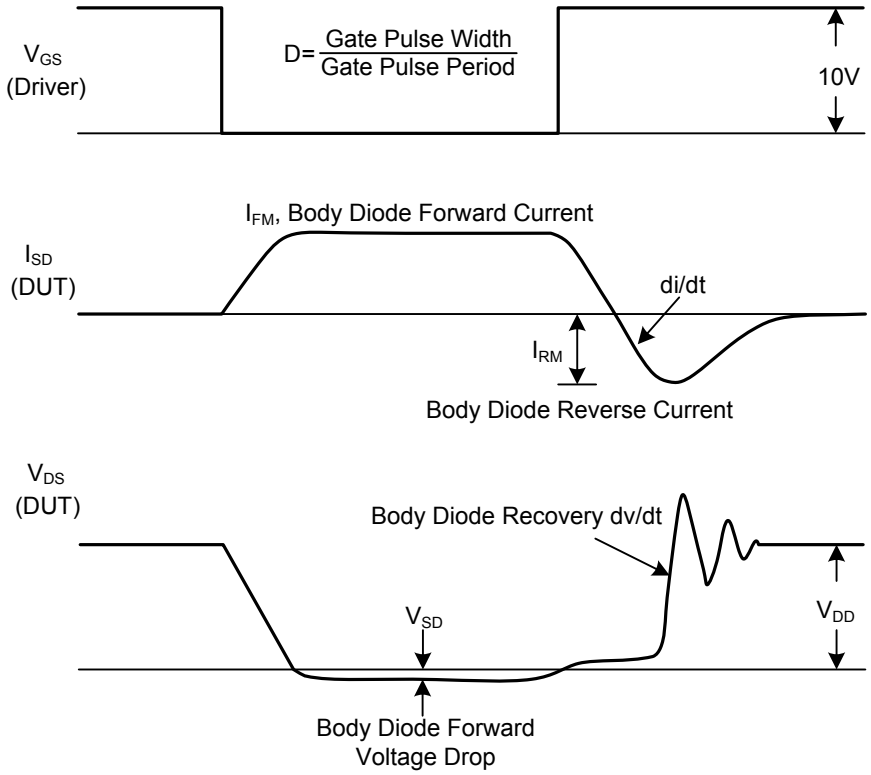


P-CHANNEL



Peak Diode Recovery dv/dt Test Circuit

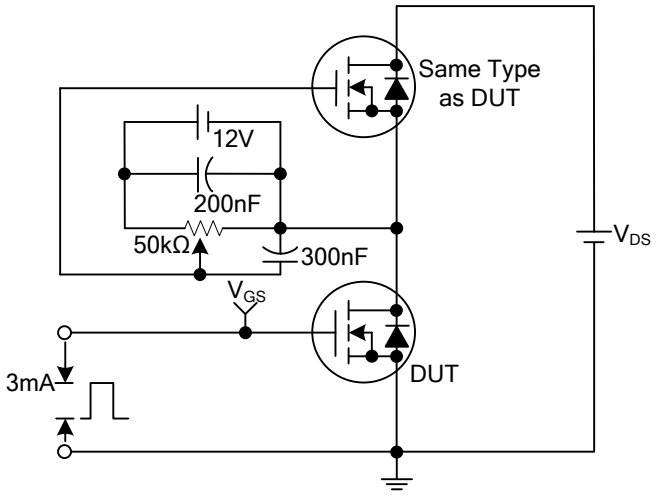
■ TEST CIRCUITS AND WAVEFORMS



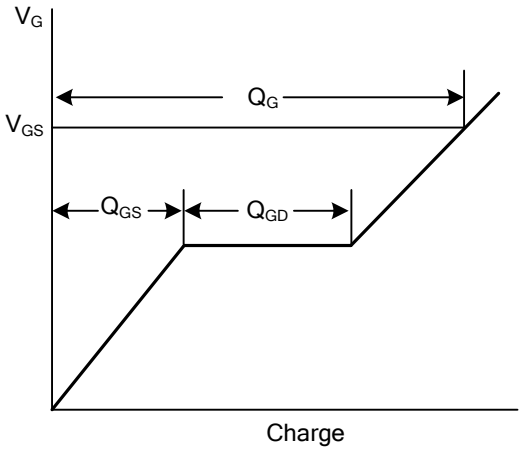
Peak Diode Recovery dv/dt Waveforms

■ TEST CIRCUITS AND WAVEFORMS

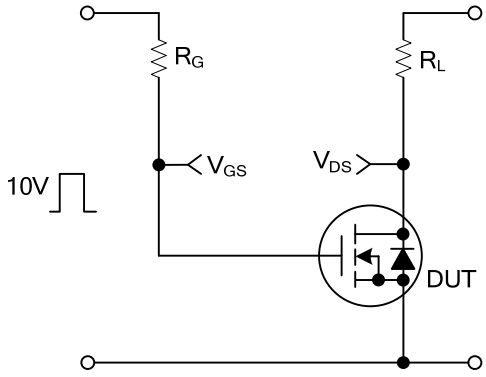
N-CHANNEL



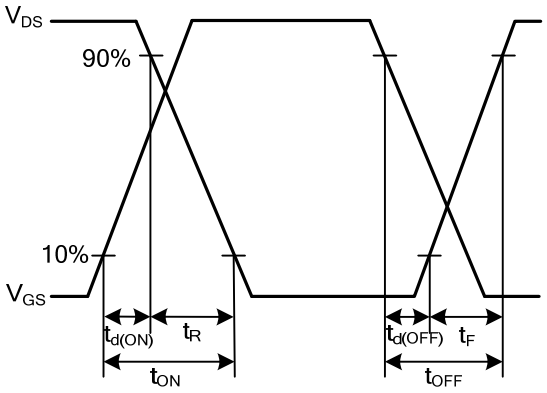
Gate Charge Test Circuit



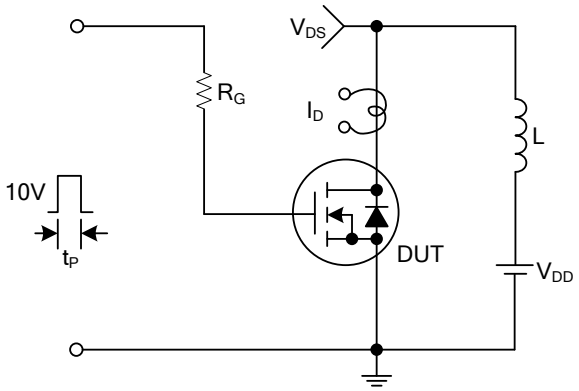
Gate Charge Waveforms



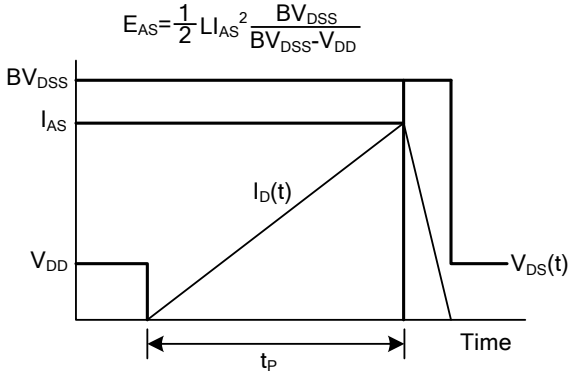
Resistive Switching Test Circuit



Resistive Switching Waveforms



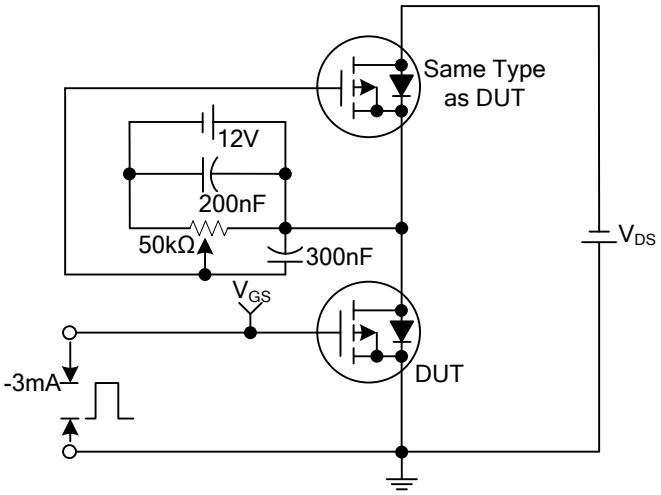
Unclamped Inductive Switching Test Circuit



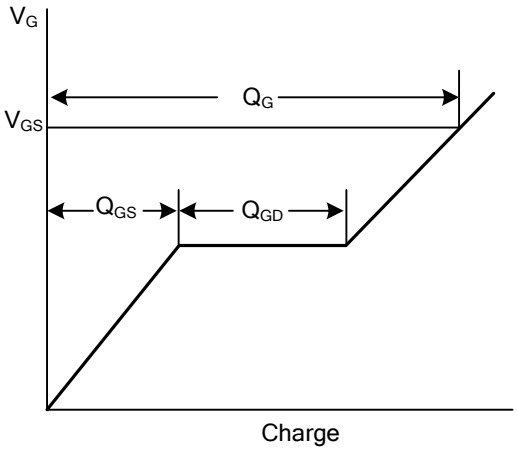
Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS (Cont.)

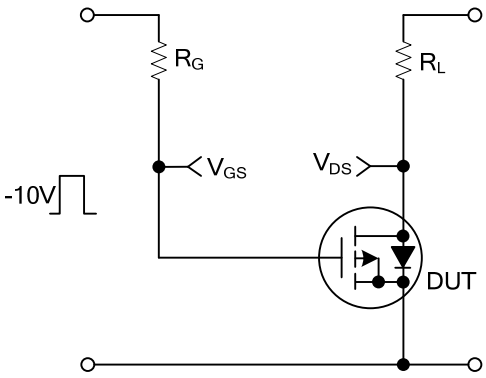
P-CHANNEL



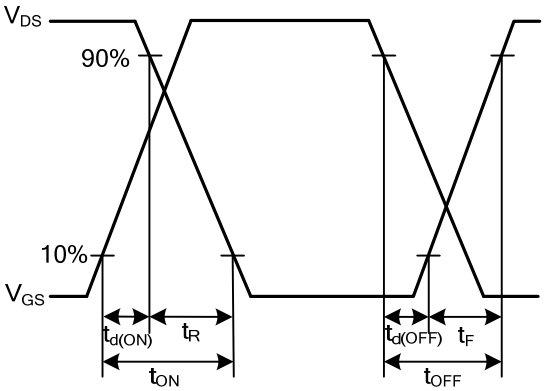
Gate Charge Test Circuit



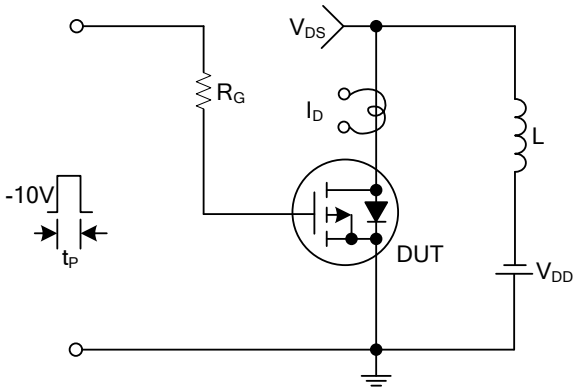
Gate Charge Waveforms



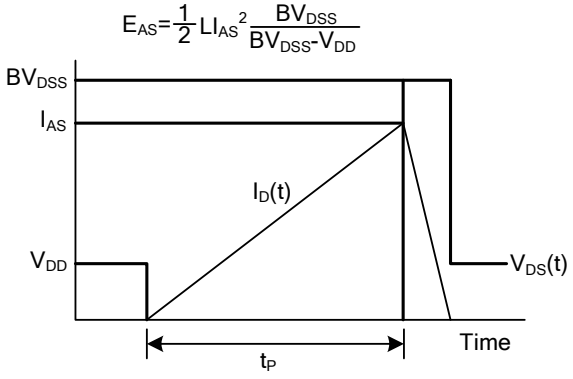
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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