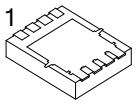
UNA03R043M

Power MOSFET

40A, 30V N-CHANNEL POWERT MOSFET



DFN5060-8

■ DESCRIPTION

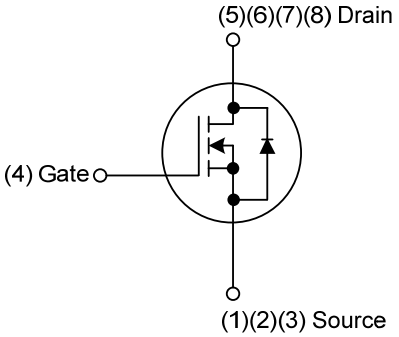
The UTC **UNA03R043M** is a N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with ideal for low voltage inverter applications.

The UTC **UNA03R043M** is suitable for high efficiency synchronous rectification in SMPS, UPS, hard switched and high frequency circuits.

■ FEATURES

* $R_{DS(ON)}$ < 4.3mΩ @ V_{GS}=10V, I_D=20A
  $R_{DS(ON)}$ < 5.9mΩ @ V_{GS}=4.5V, I_D=20A
* High speed switching
* Low drive current

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UNA03R043ML-K08-5060-R	UNA03R043MG-K08-5060-R	DFN5060-8	G1	D1	D1	D1	G2	S2	S2	S2	Tape Reel

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

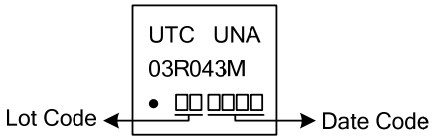
UNA03R043MG-K08-5060-R

(1)Packing Type — (1) R: Tape Reel

(2)Package Type — (2) K08-5060: DFN5060-8

(3)Green Package — (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	40	A
	Pulsed	I_{DM}	160	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	120	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	240	V/ns
Power Dissipation		P_D	15	W
Junction Temperature		T_J	+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. L=0.15mH, I_{AS}=40A, V_{DD}= 10V, R_G=25Ω, Starting T_J=25°C
4. I_{SD}≤40A, di/dt≤200A/μs, V_{DD}≤BV_{DSS}, starting T_J=25°C

■ THERMAL DATA

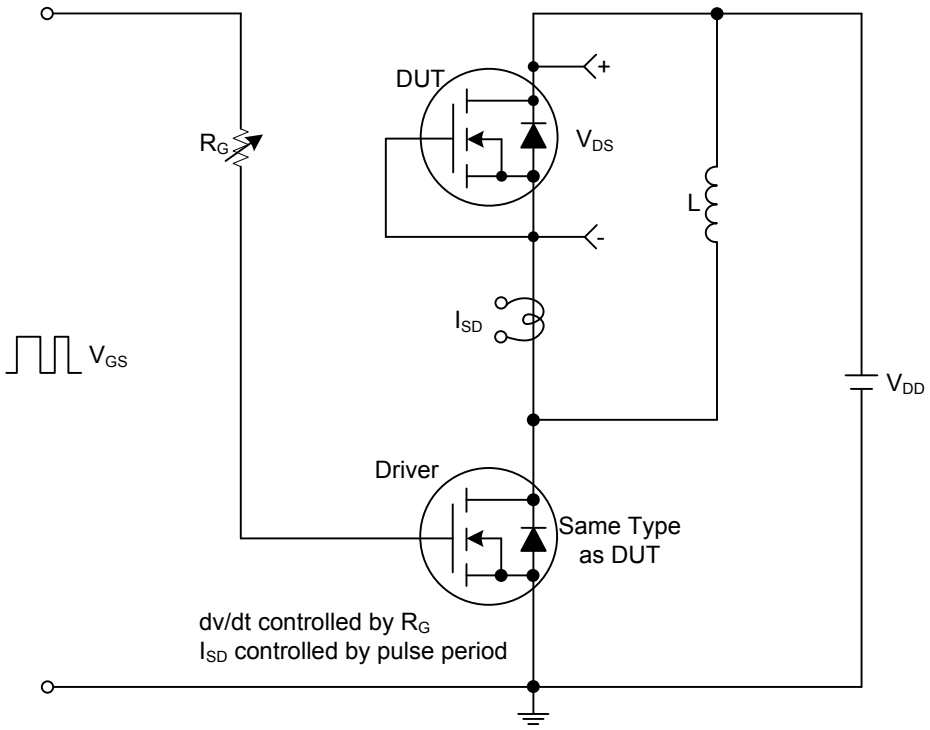
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	65	°C/W
Junction-to-Case	θ_{JC}	8.33	°C/W

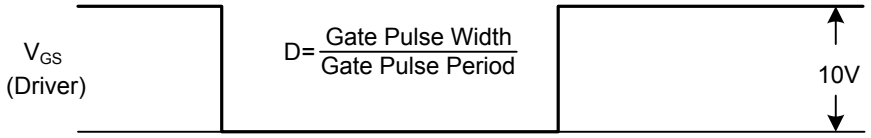
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

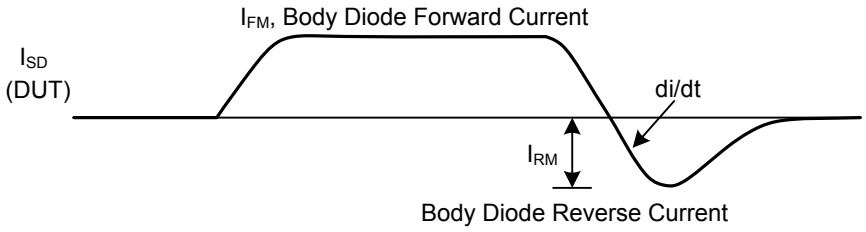
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=10mA, V_{GS}=0V	30			V
Zero Gate Voltage Drain Current		I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			0.1	μA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-0.1	μA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=1mA	1.2		2.5	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=20A (Note 4)			4.3	mΩ
			V_{GS}=4.5V, I_D=20A (Note 4)			5.9	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=10V, f=1.0MHz		3600		pF
Output Capacitance		C_{OSS}			650		pF
Reverse Transfer Capacitance		C_{RSS}			24		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{GS}=10V, V_{DD}=24V, I_D=40A		52.5		nC
Gate to Source Charge		Q_{GS}			22		nC
Gate to Drain Charge		Q_{GD}			5		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{GS}=10V, V_{DD}≈15V, I_D=20A, R_G=4.7Ω, R_L=0.5Ω		24.4		ns
Rise Time		t_R			7.5		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			76		ns
Fall-Time		t_F			29		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I_S				40	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				160	A
Source to Drain Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_F=40A		0.83	1.08	V
Reverse Recovery Time		t_{rr}	I_F=40A, V_{GS}=0, di_F/dt=100A/μs		304		ns
Body Diode Reverse Recovery Charge		Q_{rr}			6.18		μC

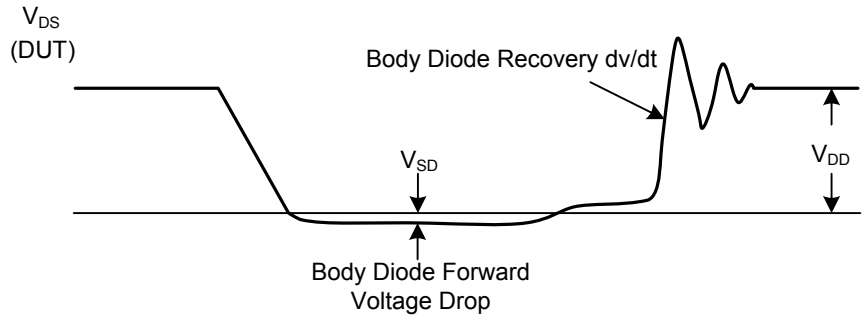
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle≤2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



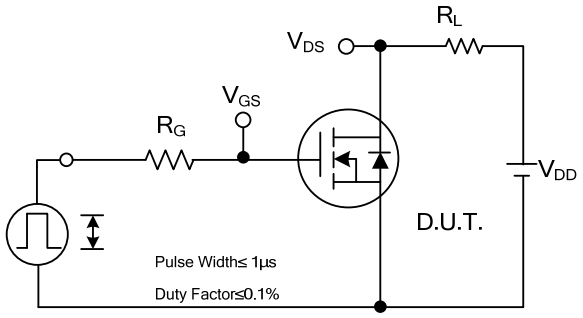




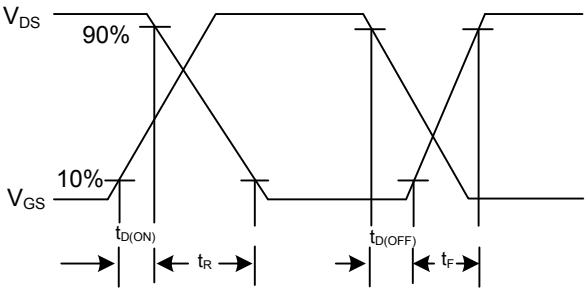


Peak Diode Recovery dv/dt Test Circuit and Waveforms

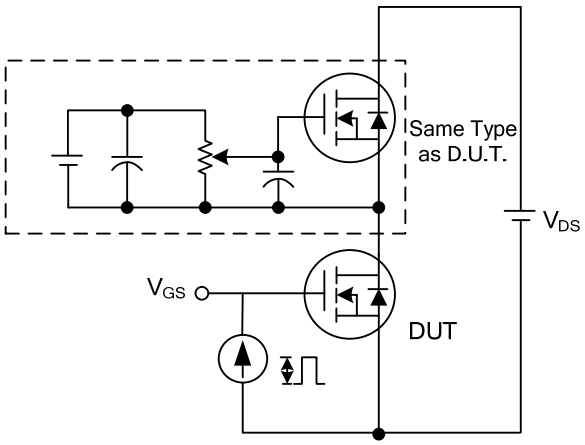
■ TEST CIRCUITS AND WAVEFORMS



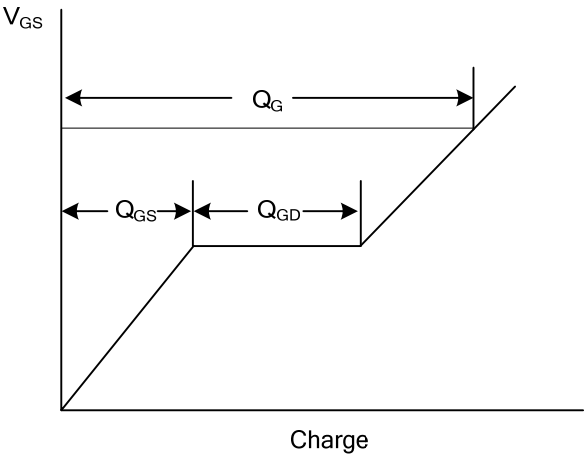
Switching Test Circuit



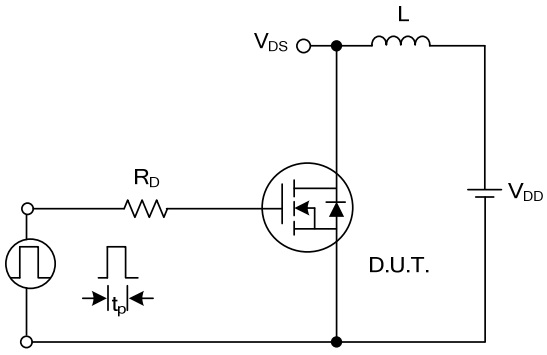
Switching Waveforms



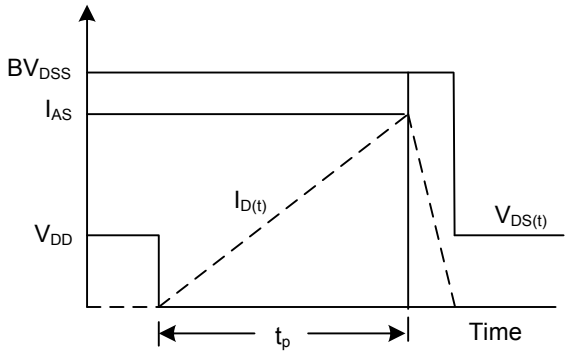
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS