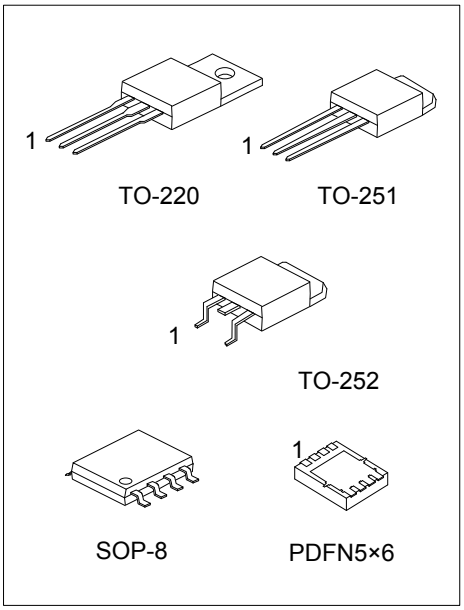
UTN6266

Power MOSFET

30A, 60V N-CHANNEL TRENCH MOSFET



■ DESCRIPTION

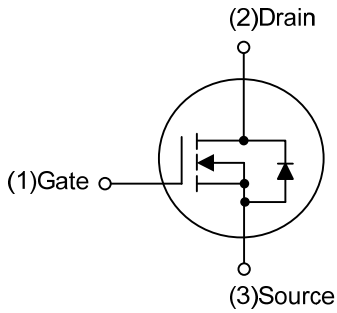
The UTC **UTN6266** is a N-Channel trench mosfet, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, high switching speed and low gate charge.

The UTC **UTN6266** is suitable for Synchronus Rectification in DC/DC and AC/DC Converters and industrial and Motor Drive applications.

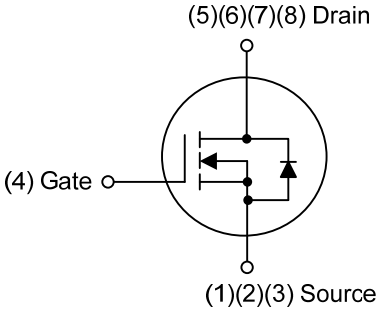
■ FEATURES

* $R_{DS(ON)}$ ≤ 15 mΩ @ V_{GS}=10V, I_D=20A
  $R_{DS(ON)}$ ≤ 19 mΩ @ V_{GS}=4.5V, I_D=18A
* Low gate charge
* Low $R_{DS(ON)}$
* High switching speed

■ SYMBOL



TO-220/TO-251/TO-252

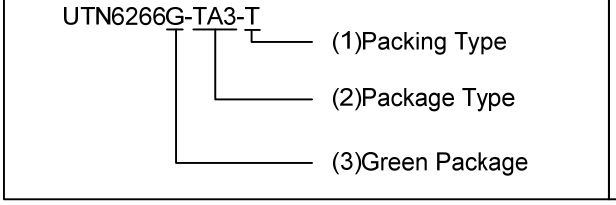


SOP-8/PDFN5×6

■ ORDERING INFORMATION

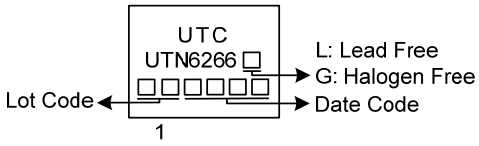
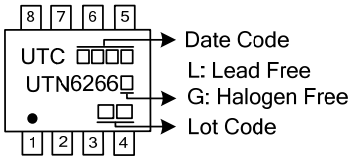
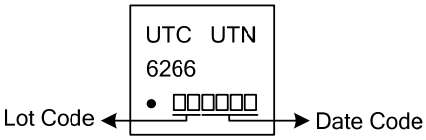
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTN6266L-TA3-T	UTN6266G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTN6266L-TM3-T	UTN6266G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UTN6266L-TN3-R	UTN6266G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTN6266L-S08-R	UTN6266G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UTN6266L-P5060-R	UTN6266G-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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



(1) T: Tube, R: Tape Reel
(2) TA3: TO-220, TM3: TO-251, TN3: TO-252
S08: SOP-8, P5060: PDFN5×6
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

Package	Marking
TO-220 TO-251 TO-252	
SOP-8	
PDFN5×6	

■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise noted)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	30	A
	Pulsed	I_{DM}	90	A
Avalanche Current (Note 3)		I_{AS}	20	A
Avalanche Energy (Note 2, 3)		E_{AS}	280	mJ
Power Dissipation	TO-220	P_D	2	W
	TO-251/TO-252		1.2	W
	SOP-8		1.5	W
	PDFN5×6		1.92	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. Single pulse width by junction temperature $T_{J(max)}$=150°C.
3. L = 1.4mH, I_{AS} = 20A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C

■ THERMAL CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	°C/W
	TO-251		110	°C/W
	TO-252		60 (Note 2)	°C/W
	SOP-8		85 (Note 2)	°C/W
	PDFN5×6		65 (Note 2)	°C/W
Junction-to-Case	TO-220	θ_{JC}	1.4	°C/W
	TO-251/TO-252		2.6	°C/W
	SOP-8		24	°C/W
	PDFN5×6		12	°C/W

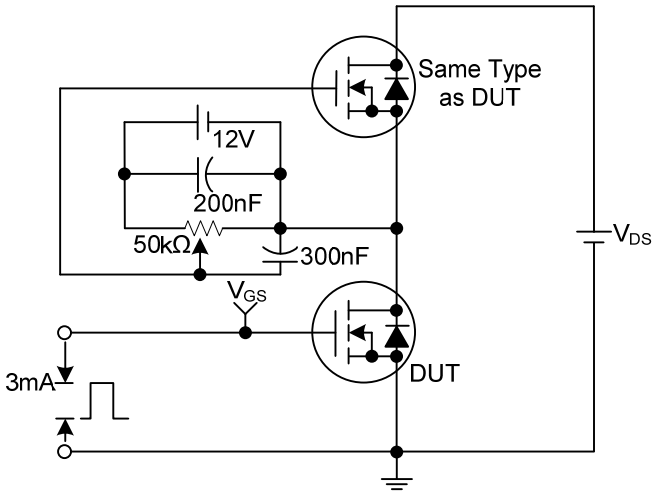
Notes: 1. The θ_{JA} is the sum of the thermal impedance from junction to case θ_{JC} and case to ambient.
2. The value of θ_{JA} is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper.

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

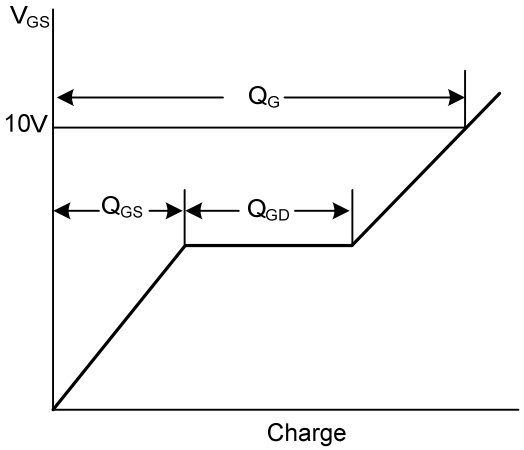
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	60			V
Zero Gate Voltage Drain Current		I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
			V_{DS}=60V, V_{GS}=0V, T_J=55°C			5	μA
Gate-Body Leakage Current	Forward	I_{GSS}	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	1.5	2.0	2.5	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		12	15	mΩ
			V_{GS}=10V, I_D=20A, T_J=125°C		20.5	25	mΩ
			V_{GS}=4.5V, I_D=18A		15	19	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=30V, f=1.0MHz		2800		pF
Output Capacitance		C_{OSS}			190		pF
Reverse Transfer Capacitance		C_{RSS}			140		pF
Gate Resistance		R_G	f=1.0MHz		2.4		Ω
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{GS}=10V, V_{DS}=30V, I_D=20A		62		nC
Gate to Source Charge		Q_{GS}			8		nC
Gate to Drain Charge		Q_{GD}			10		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{GS}=10V, V_{DS}=30V, R_L=1.5Ω, R_{GEN}=3Ω		12		ns
Rise Time		t_R			16		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			52		ns
Fall-Time		t_F			22		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				30	A
Drain-Source Diode Forward Voltage (Note2)		V_{SD}	I_S=1A, V_{GS}=0V		0.72	1	V

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Pulse width ≤ 300us, duty cycle ≤ 2%.
3. Surface Mounted on 1in ^{2} pad area.

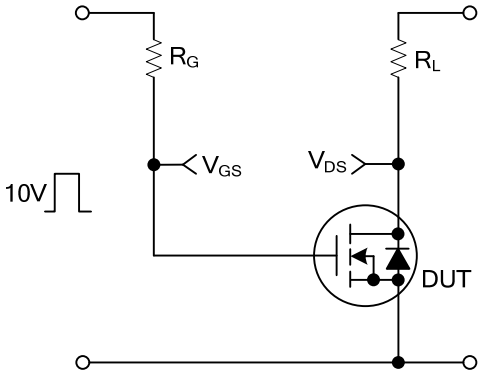
■ TEST CIRCUITS AND WAVEFORMS



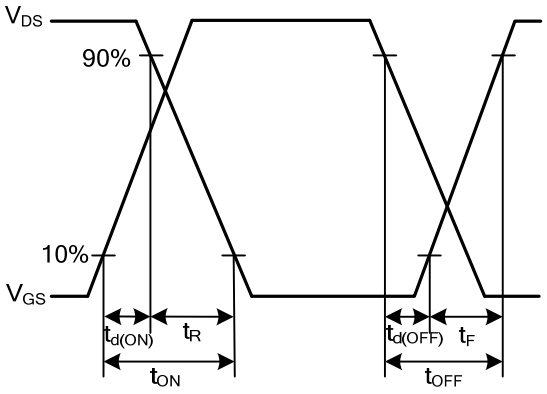
Gate Charge Test Circuit



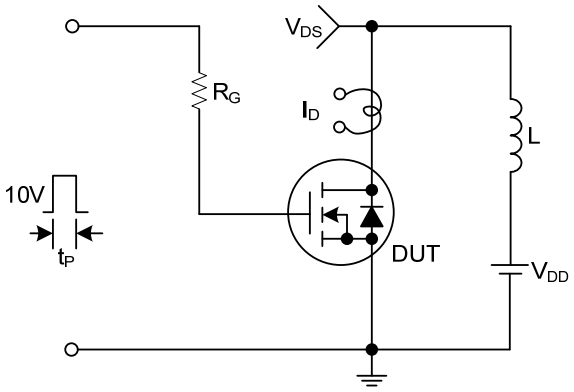
Gate Charge Waveforms



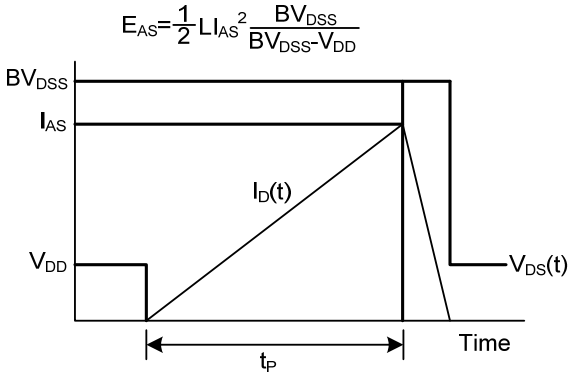
Resistive Switching Test Circuit



Resistive Switching Waveforms

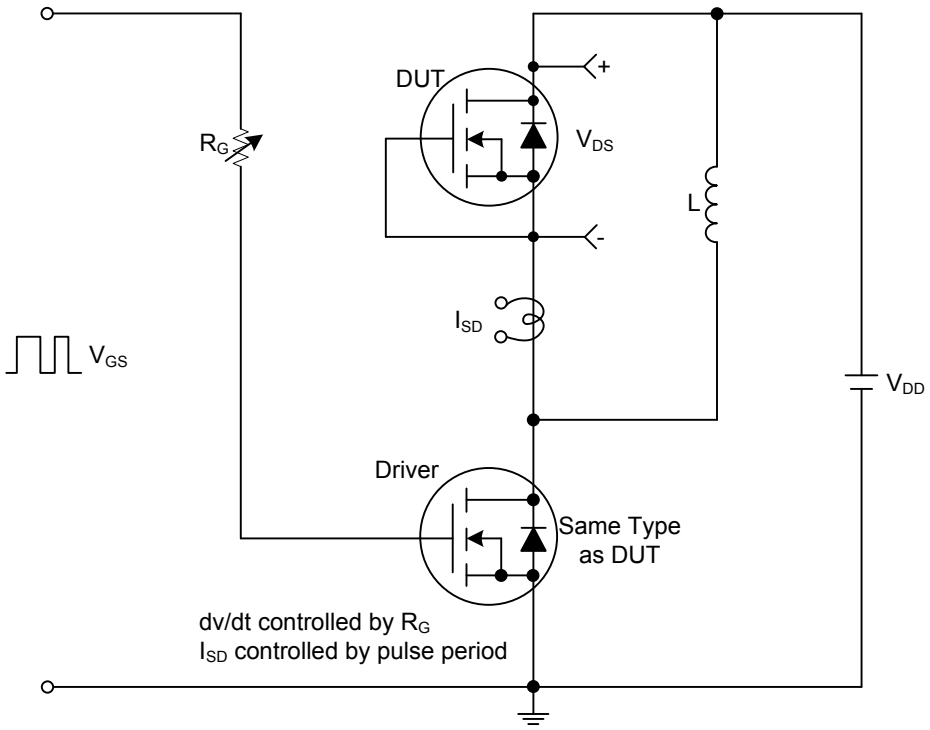


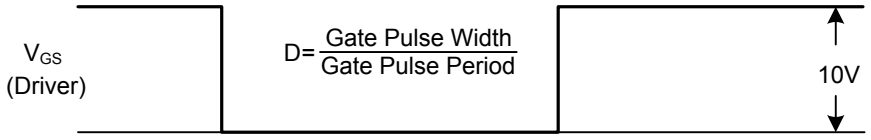
Unclamped Inductive Switching Test Circuit

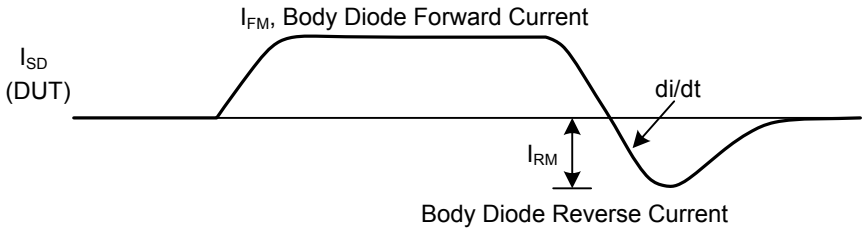


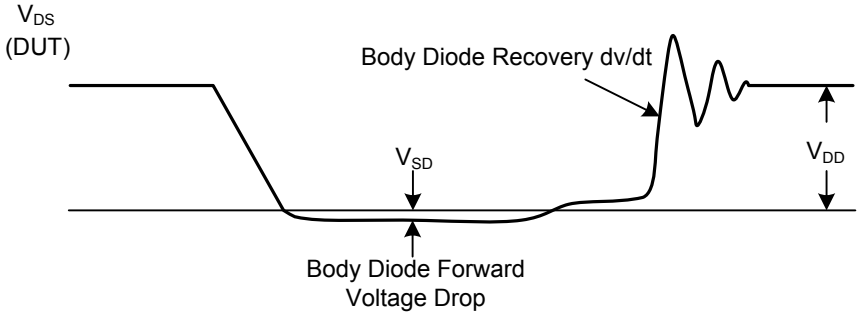
Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS





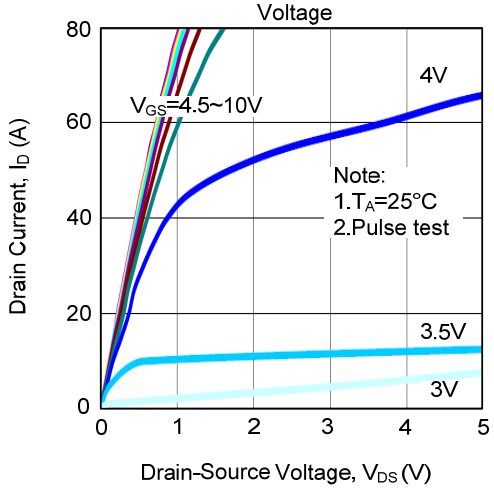




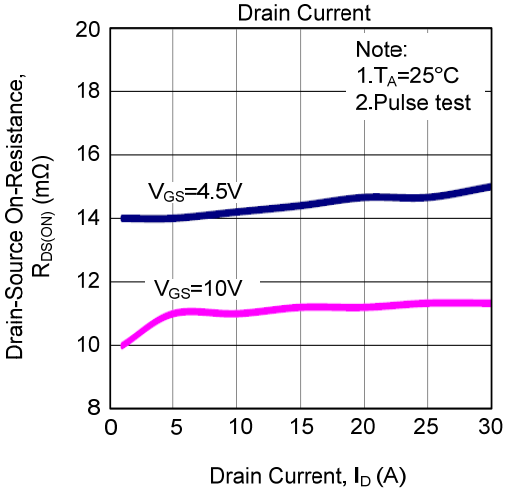
Peak Diode Recovery dv/dt Test Circuit and Waveforms

■ TYPICAL CHARACTERISTICS

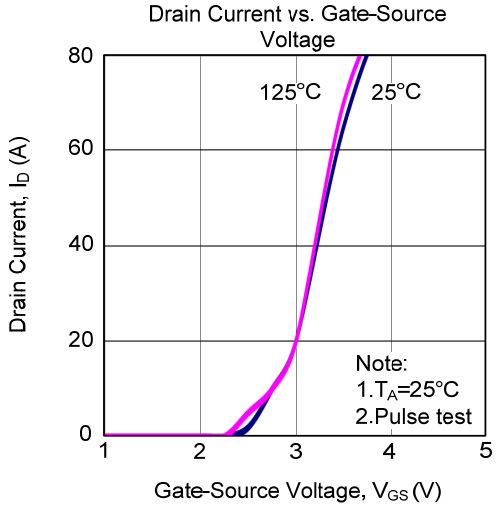
Drain Current vs. Drain-Source Voltage



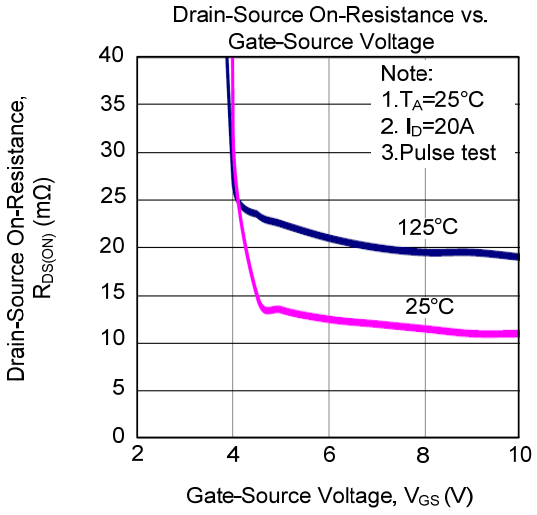
Drain-Source On-Resistance vs. Drain Current



Drain Current vs. Gate-Source Voltage



Drain-Source On-Resistance vs. Gate-Source Voltage



Drain-Source On-Resistance vs. Junction Temperature