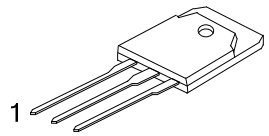
26A, 500V N-CHANNEL POWER MOSFET



TO-3P

■ DESCRIPTION

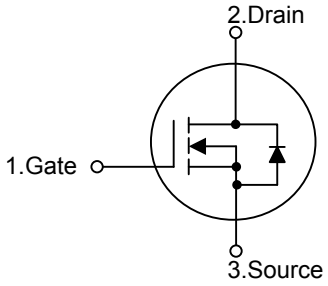
The UTC **26N50** is an N-channel mode power MOSFET using UTC's advanced technology to provide customers with planar stripe and DMOS technology. This technology allows a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode.

The UTC **26N50** is generally applied in high efficiency switch mode power supplies, active power factor correction and electronic lamp ballasts based on half bridge topology.

■ FEATURES

* $R_{DS(ON)}$=0.24Ω @ V_{GS}=10V
* High Switching Speed
* 100% Avalanche Tested

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
26N50L-T3P-T	26N50G-T3P-T	TO-3P	G	D	S	Tube

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

26N50L-T3P-T (1)Packing Type (2)Package Type (3)Lead Free	(1) T: Tube (2) T3P: TO-3P (3) G: Halogen Free, L: Lead Free

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	500	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	Continuous (T_C=25°C)	I_D	24(Note 2)	A
	Pulsed (Note 3)	I_{DM}	96 (Note 2)	A
Avalanche Current (Note 3)		I_{AR}	26	A
Avalanche Energy	Single Pulsed (Note 4)	E_{AS}	1100	mJ
	Repetitive (Note 5)	E_{AR}	29	mJ
Peak Diode Recovery dv/dt (Note 5)		dv/dt	15	V/ns
Power Dissipation		P_D	290	W
Derate above 25°C			2.33	W/°C
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55~+150	°C

Note: 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. Drain current limited by maximum junction temperature
3. Repetitive Rating: Pulse width limited by maximum junction temperature
4. L =3.4mH, I_{AS} = 26A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
5. I_{SD} ≤ 26A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	40	°C/W
Junction to Case	θ_{JC}	0.43	°C/W

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

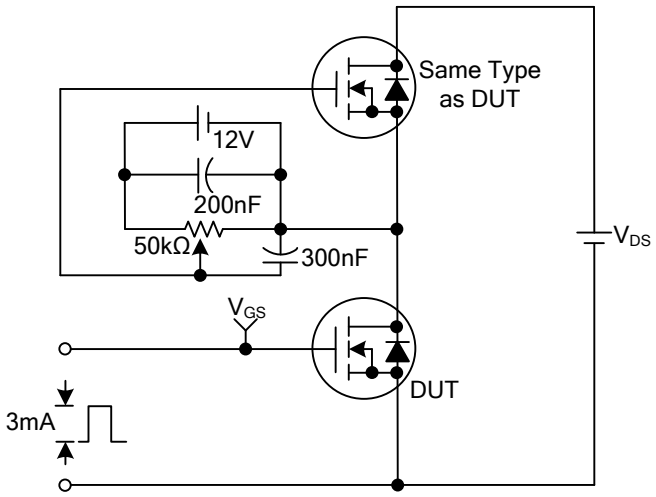
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	500			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=500V, V_{GS}=0V			50	μA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=+30V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-30V, V_{DS}=0V			-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		$R_{DS(ON)}$	V_{GS}=10V, I_D=13A		0.15	0.24	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		3500	4500	pF
Output Capacitance		C_{OSS}			520	670	pF
Reverse Transfer Capacitance		C_{RSS}			55	70	pF

■ ELECTRICAL CHARACTERISTICS(Cont.)

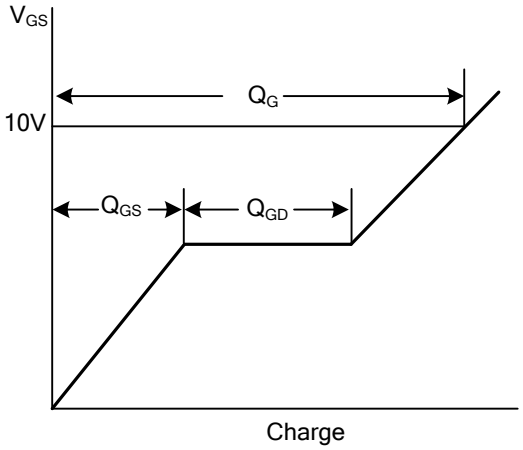
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{GS}=10V, V_{DS}=400V, I_D=26A (Note 1, 2)		90	120	nC
Gate to Source Charge	Q_{GS}			23		nC
Gate to Drain Charge	Q_{GD}			52		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=250V, I_D=26A, R_G=25Ω (Note 1, 2)		80	170	ns
Rise Time	t_R			250	500	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			200	400	ns
Fall-Time	t_F			155	320	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				24	A
Maximum Body-Diode Pulsed Current	I_{SM}				96	A
Drain-Source Diode Forward Voltage	V_{SD}	I_S=26A, V_{GS}=0V			1.4	V
Body Diode Reverse Recovery Time	t_{rr}	I_S=26A, V_{GS}=0V, dI_F/dt=100A/μs (Note 1)		250		ns
Body Diode Reverse Recovery Charge	Q_{RR}			1.1		μC

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

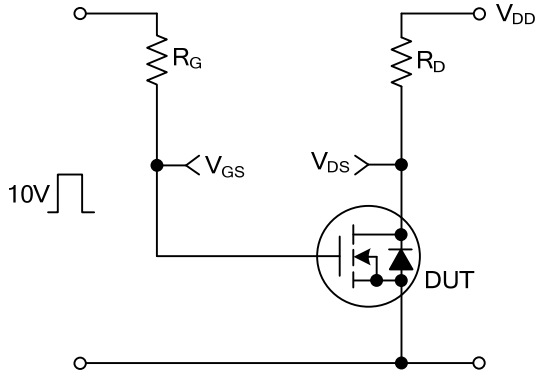
■ TEST CIRCUITS AND WAVEFORMS



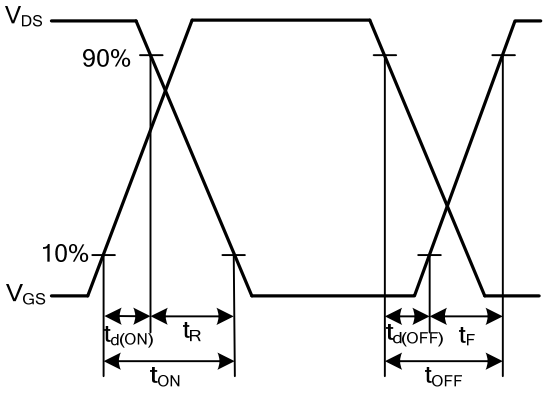
Gate Charge Test Circuit



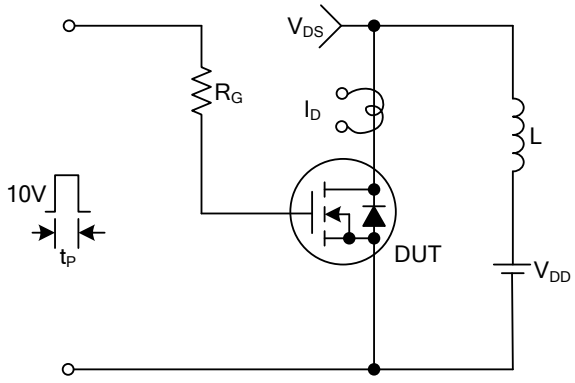
Gate Charge Waveforms



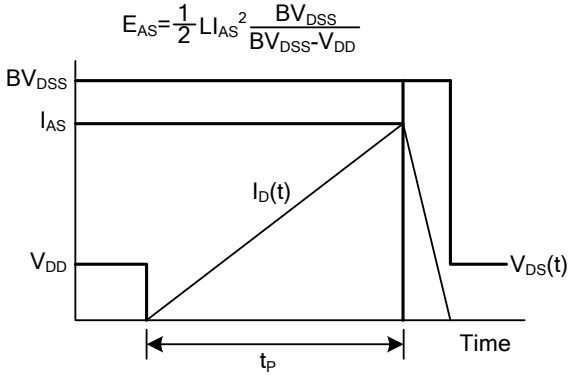
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TEST CIRCUITS AND WAVEFORMS(Cont.)

Peak Diode Recovery dv/dt Test Circuit & Waveforms