

DESCRIPTION

The **7N50** 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 **7N50** is generally applied in high efficiency switch mode power supplies, active power factor correction and electronic lamp ballasts based on half bridge topology.

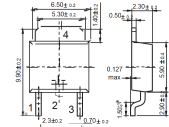


General Features

$V_{DS} = 500V$ $ID = 7A$
 $R_{DS(on)} = 0.85\Omega$

TO-252

Unit: mm



Dimensions in inches and (millimeters)

ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	± 30	V
Drain Current	I_D	7 *	A
		28 *	A
Avalanche Current (Note 1)	I_{AS}	7	A
Avalanche Energy	E_{AS}	270	mJ
Repetitive (Note 3)	E_{AR}	8.9	mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.5	V/ns
Power Dissipation	P_D	89	W
		39	W
		0.71	W/°C
		0.31	W/°C
Junction Temperature	T_J	+150	°C
Storage Temperature	T_{STG}	-55~+150	°C

Note: 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.
* Drain current limited by maximum junction temperature

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ELECTRICAL CHARACTERISTICS ($T_C=25^\circ C$, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DS}	$I_D=250\mu A$, $V_{GS}=0V$	500			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=500V$, $V_{GS}=0V$			1	μA
		$V_{DS}=400V$, $T_C=125^\circ C$			10	μA
Gate-Source Leakage Current	Forward Reverse	$V_{GS}=430V$, $V_{DS}=0V$			+100	nA
		$V_{DS}=-30V$, $V_{GS}=0V$			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V$, $I_D=3.5A$		0.85	1.05	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{iss}	$V_{DS}=0V$, $V_{GS}=25V$, $f=1MHz$		720	940	pF
Output Capacitance	C_{oss}			95	190	pF
Reverse Transfer Capacitance	C_{rss}			9	13.5	pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_g	$V_{DS}=10V$, $V_{GS}=400V$, $I_D=7A$ (Note 4, 5)		12.8	16.6	nC
Gate to Source Charge	Q_{GS}			3.7		nC
Gate to Drain Charge	Q_{GD}			5.8		nC
Turn-On Delay Time	t_{ON}			6	20	ns
Rise Time	t_r	$V_{DS}=250V$, $I_D=7A$, $R_{\theta}=25\Omega$		55	120	ns
Turn-Off Delay Time	t_{OFF}	(Note 4, 5)		25	60	ns
Fall-Time	t_f			35	80	ns

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

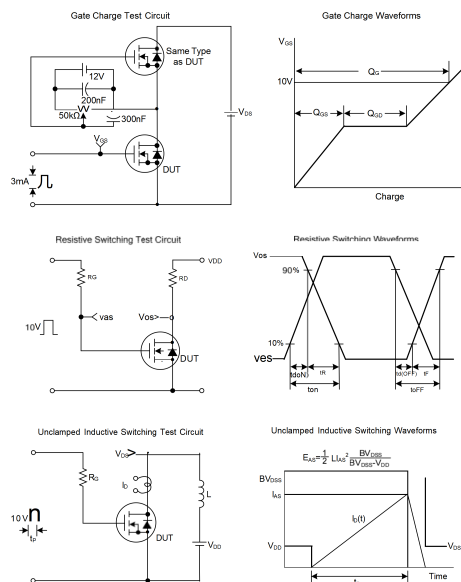
Maximum Body-Diode Continuous Current	I_S			7	A
Maximum Body-Diode Pulsed Current	I_{SP}			28	A
Drain-Source Diode Forward Voltage	V_{SD}	$I_S=7A$, $V_{GS}=0V$		1.4	V
Body Diode Reverse Recovery Time	t_{RR}	$I_S=7A$, $V_{GS}=0V$, $dv/dt=100A/\mu s$		275	ns
Body Diode Reverse Recovery Charge	Q_{RR}	(Note 4)		0.04	μC

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $L = 10mH$, $I_D = 7A$, $V_{GS} = 50V$, $R_{\theta} = 25\Omega$, Starting $T_J = 25^\circ C$
3. $I_{DS} \leq 7A$, $dv/dt \leq 200A/\mu s$, $V_{DS} \leq BV_{DS}$, Starting $T_J = 25^\circ C$
4. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
5. Essentially independent of operating temperature

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RATING AND CHARACTERISTIC CURVES (7N50)



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