



FEATURES

$R_{DS(on)} < 1.75 \Omega$ @ $V_{GS} = 10V$
Fast Switching Capability
Avalanche Energy Specified
Improved dv/dt Capability, High Ruggedness

APPLICATIONS

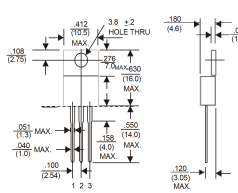
High frequency switching mode power supply
Electronic ballast
LED power supply

PRODUCT CHARACTERISTICS

V _{DS}	500V
R _{DS(on)} max (V _{GS} =10V)	1.75 Ω
Q _g type	24nC
I _D	5A



TO-220AB



Dimensions in inches and (millimeters)

ABSOLUTE MAXIMUM RATINGS (T_C = 25°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	5	A
Drain Current	I _{DM}	20	A
Avalanche Current (Note 2)	I _{AS}	5	A
Avalanche Energy	E _{AS}	300	mJ
Avalanche Energy	E _{AR}	7.3	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.5	V/ns
Power Dissipation	P _D	125	W
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. Repetitive Rating: Pulse width limited by maximum junction temperature

3. L = 21.5mH, I_{AS} = 5A, V_{DS} = 50V, R_θ = 25°C, Starting T_J = 25°C

4. I_{AS} ≤ 5A, di/dt ≤ 200A/μs, V_{DS} ≤ BV_{DS}, Starting T_J = 25°C

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DS}	I _D =250μA, V _{GS} =0V	500			V
Breakdown Voltage Temperature Coefficient	-BV _{DS} /°C	Reference to 25°C, I _D =250μA		0.5		V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =500V, V _{GS} =0V			1	μA
		V _{DS} =400V, T _C =125°C			10	μA
Gate-Source Leakage Current	I _{GS}	V _{GS} =30V, V _{DS} =0V			100	nA
		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 =2.5A	1.45	1.75		Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		480	625	pF
Output Capacitance	C _{oss}			80	105	pF
Reverse Transfer Capacitance	C _{rss}			15	20	pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =400V, I _D =5A (Note 1, 2)		18	24	nC
Gate to Source Charge	Q _{GS}			2.2		nC
Gate to Drain Charge	Q _{GD}			9.7		nC
Turn-ON Delay Time	t _{D(on)}			12	35	ns
Rise Time	t _r	V _{DS} =250V, I _D =5A, R _θ =25°C (Note 1, 2)		46	100	ns
Turn-OFF Delay Time	t _{D(off)}			50	110	ns
Fall Time	t _f			48	105	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I _S				5	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}				20	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =5A, V _{GS} =0V			1.4	V
Reverse Recovery Time	t _r	I _S =5A, V _{GS} =0V, di/dt=100A/μs (Note 1)		83		ns
Reverse Recovery Charge	Q _{RR}			0.25		μC

Note: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%

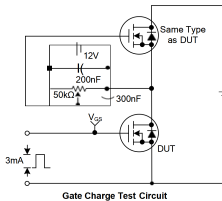
2. Essentially independent of operating temperature

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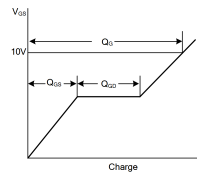
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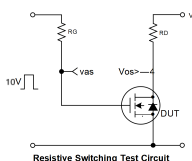
RATING AND CHARACTERISTIC CURVES (5N50)



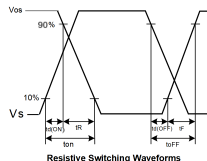
Gate Charge Test Circuit



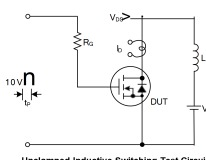
Gate Charge Waveforms



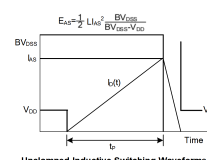
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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