

Features

- $R_{DS(ON)} = 0.35\Omega$
- Ultra low gate charge (Typical 150 nC)
- Low reverse transfer capacitance ($CRSS =$ typical 36 pF)
- Fast switching capability
- Avalanche energy specified
- Improved dv/dt capability, high ruggedness

Mechanical Data

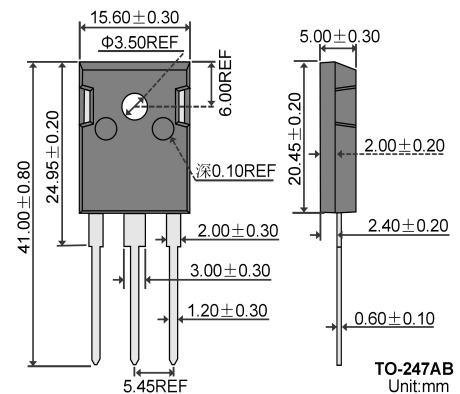
Case : Molded plastic body

Terminals : Solder plated, solderable per MIL-STD-750,Method 2026

Polarity : As marked

Mounting Position : Any

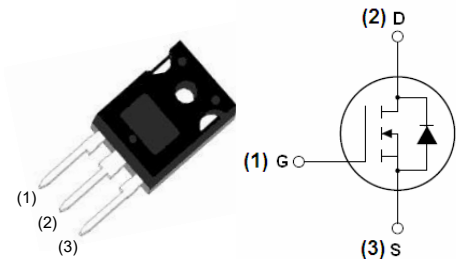
TO-247



Application

- Power factor correction (PFC)
- Switched mode power supplies(SMPS)
- Uninterruptible Power Supply (UPS)
- LLC Half-bridge

Dimensions in inches and (millimeters)



Schematic diagram

Maximum Ratings And Electrical Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified. Single phase half-wave 60Hz, resistive or inductive load, for capacitive load current derate by 20%.

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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V _{DSS}	650	V
Gate-Source Voltage	V _{GSS}	±30	V
Avalanche Current	I _{AR}	20	A
Continuous Drain Current	I _D	20	A
Pulsed Drain Current (Note 1)	I _{DM}	88	A
Avalanche Energy	Single Pulsed	E _{AS}	380
	Repetitive	E _{AR}	37
Peak Diode Recovery dv/dt (Note 2)	dv/dt	18	V/ns
Power Dissipation	P _D	370	W
Junction Temperature	T _J	150	°C
Operating Temperature	T _{OPR}	-55 ~ +150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Note: 1. Repetitive rating; pulse width limited by max. junction temperature.

2. $I_{SD} \leq 22A$, $di/dt \leq 540 A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ C$.

3. 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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	40	°C /W
Junction to Case	θ_{JC}	0.30	°C /W

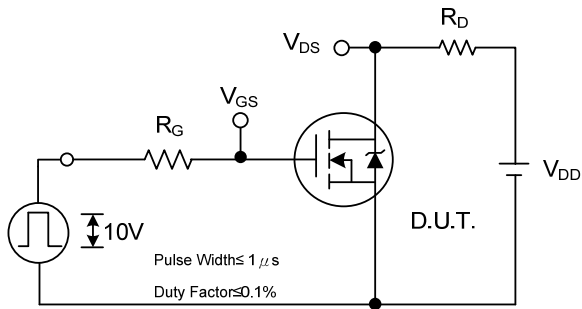
■ ELECTRICAL CHARACTERISTICS($T_J=25^\circ\text{C}$, $L=1.5\text{mH}$, $R_G=25\Omega$, $I_{AS}=22\text{A}$, Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	650			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=650\text{V}$, $V_{GS}=0\text{V}$			50	μA
Gate- Source Leakage Current	I_{GSS}	$V_{DS}=0\text{V}$, $V_{GS}=\pm 30\text{V}$			± 100	nA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=1\text{mA}$, Referenced to 25°C		0.30		V/°C
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=13\text{A}$ (Note 2)		0.3	0.35	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$		3200		pF
Output Capacitance	C_{OSS}			350		pF
Reverse Transfer Capacitance	C_{RSS}			36		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD}=300\text{V}$, $I_D=22\text{A}$, $R_G=6.2\Omega$, $V_{GS}=10\text{V}$ (Note 2)		100		ns
Turn-ON Rise Time	t_R			250		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			650		ns
Turn-OFF Fall-Time	t_F			550		ns
Total Gate Charge	Q_G	$V_{DS}=480\text{V}$, $V_{GS}=10\text{V}$, $I_D=22\text{A}$ (Note 2)			150	nC
Gate Source Charge	Q_{GS}				45	nC
Gate Drain Charge	Q_{GD}				76	nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0\text{V}$, $I_S=22\text{A}$			1.5	V
Continuous Source Current (Body Diode)	I_S	(Note 1)			22	A
Pulsed Source Current (Body Diode)	I_{SM}				88	A
Reverse Recovery Time	t_{RR}	$I_S=22\text{A}$, $di/dt=100\text{A}/\mu\text{s}$ (Note 2)		590	890	ns
Reverse Recovery Charge	Q_{RR}			7.2	11	μC

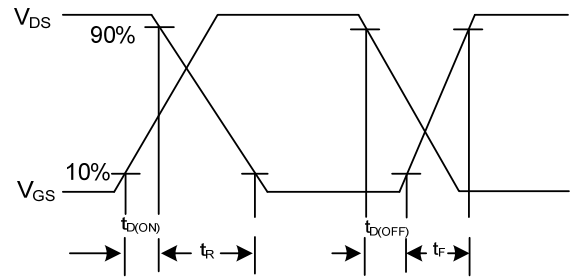
Note: 1. Repetitive rating; pulse width limited by max. junction temperature.

2. Pulse Width ≤ 300 s, Duty Cycle $\leq 2\%$.

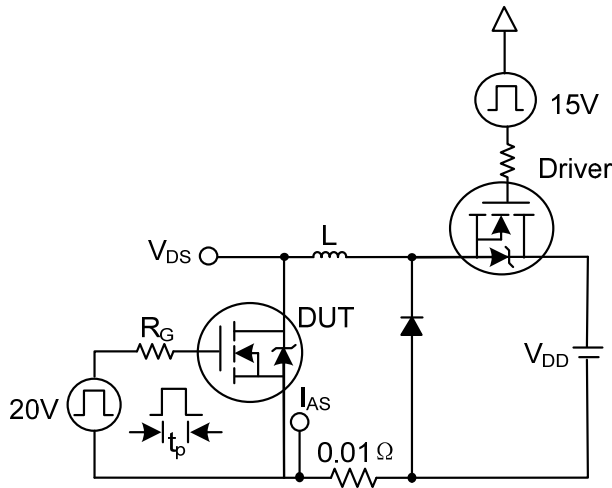
TEST CIRCUITS



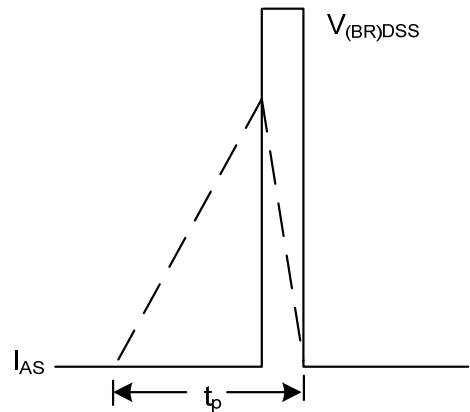
Switching Test Circuit



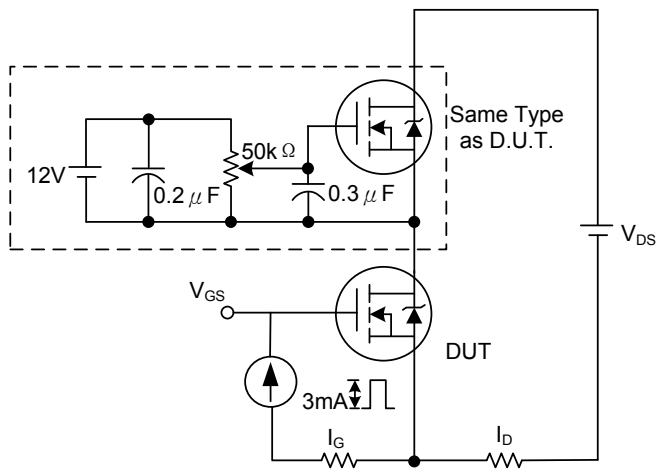
Switching Waveforms



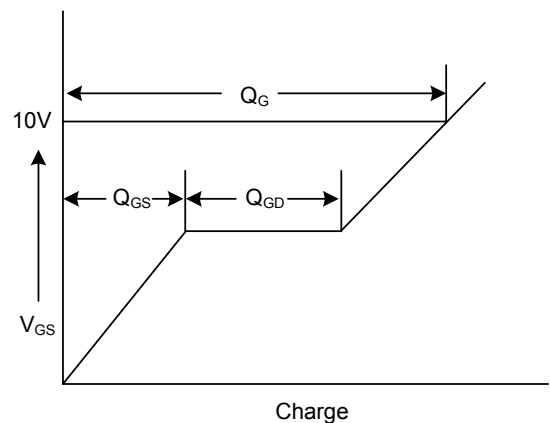
Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



Gate Charge Test Circuit



Gate Charge Waveform

■ TEST CIRCUITS(Cont.)

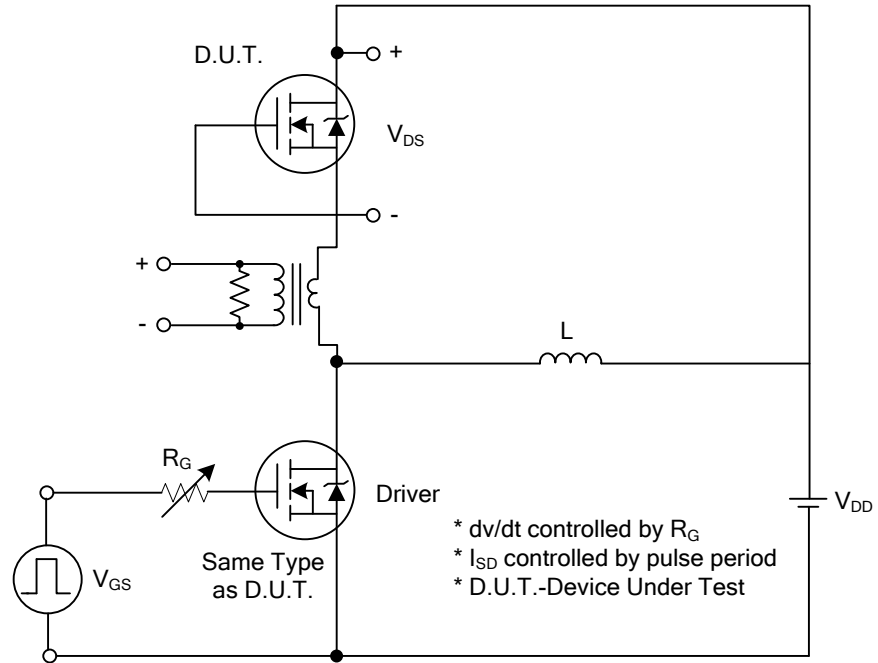
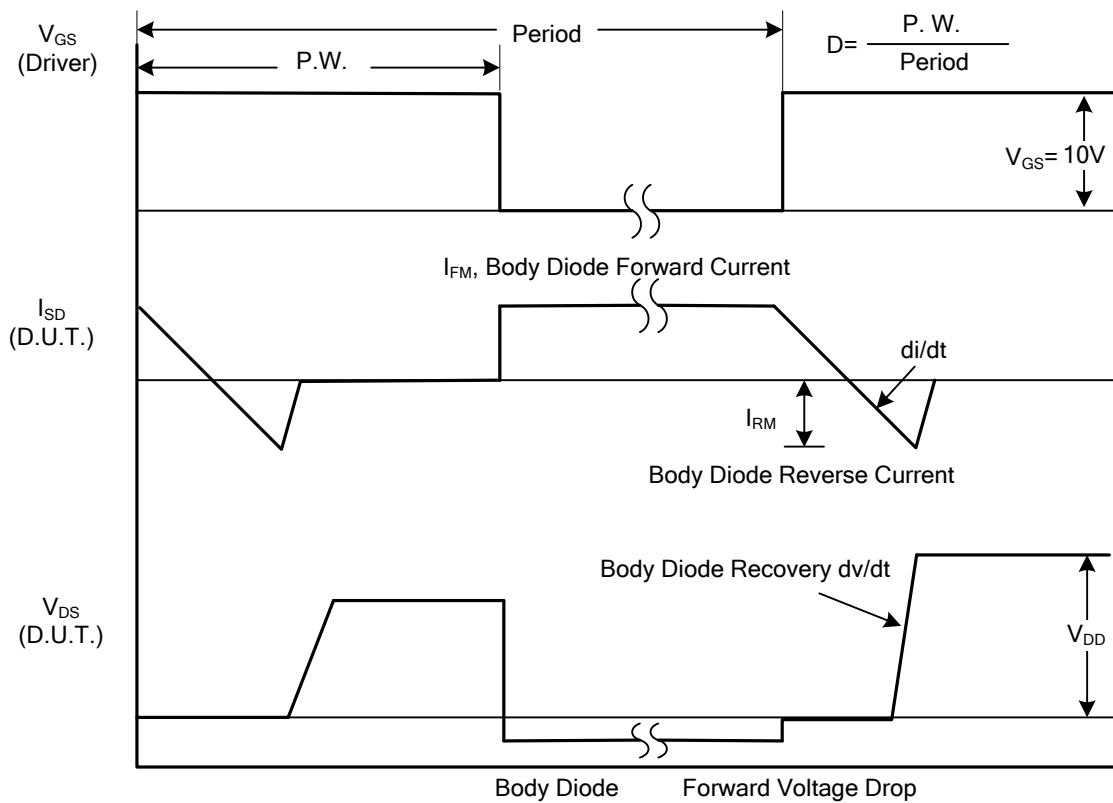
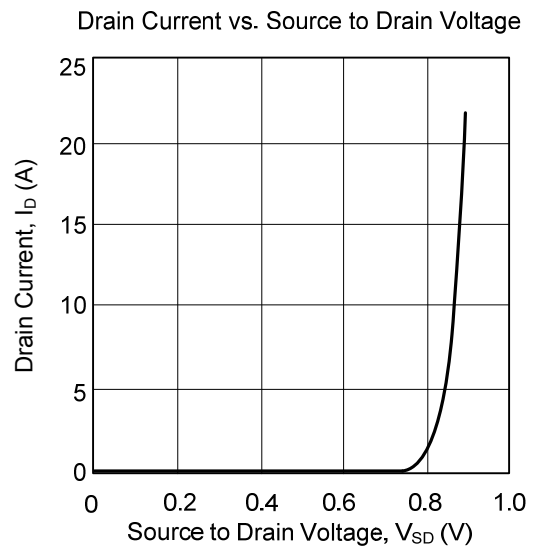
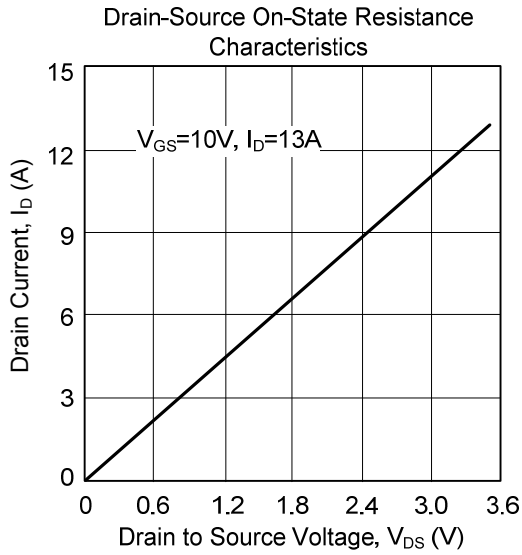
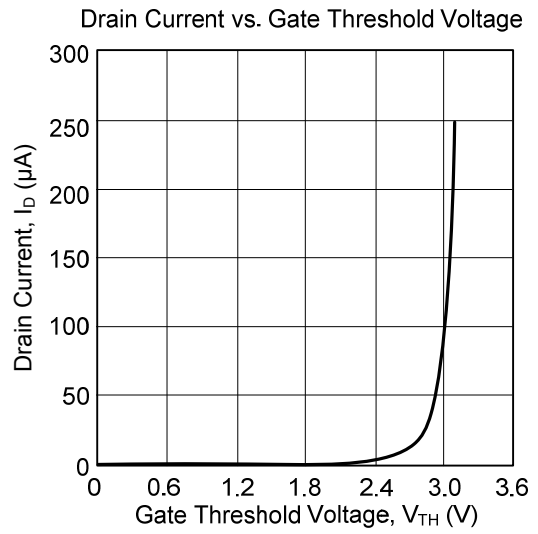
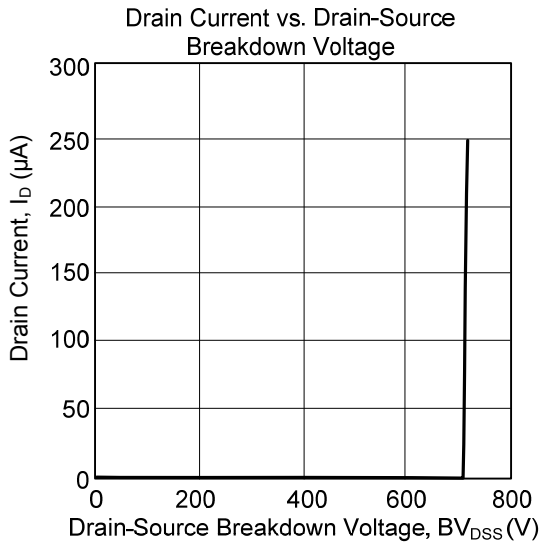


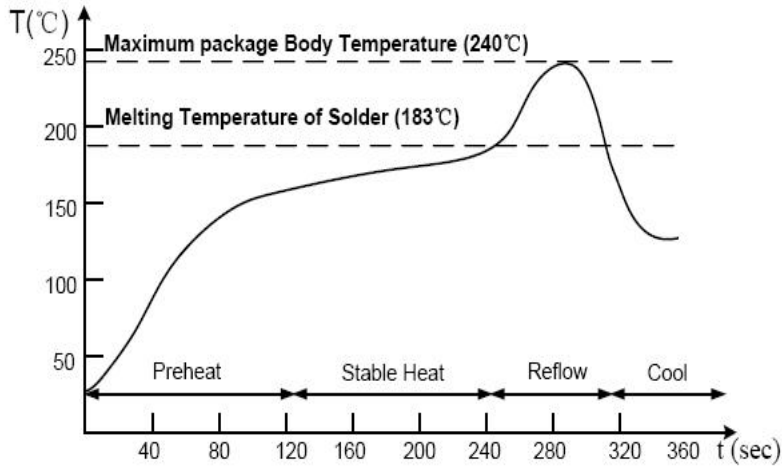
Fig. 1A Peak Diode Recovery dv/dt Test Circuit



■ TYPICAL CHARACTERISTICS



Suggested Soldering Temperature Profile



Note

- Recommended reflow methods: IR, vapor phase oven, hot air oven, wave solder.
- The device can be exposed to a maximum temperature of 265°C for 10 seconds.
- Devices can be cleaned using standard industry methods and solvents.
- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

Packing Information

Packaging	Package	Part Number	Quantity	Size
Tube	TO-247AB	Tube	30 pieces	495*45*7mm
		Inner Box	360 pieces	520*115*60mm
		Outer Box	1800 pieces	550*325*135mm