

RJH65S04DPQ-A0

650V - 50A - IGBT

Application: Inverter

R07DS0849EJ0001

Rev.0.01

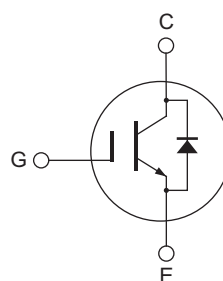
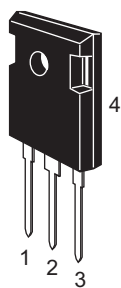
Jul 06, 2012

Features

- Low collector to emitter saturation voltage
 $V_{CE(sat)} = 1.6 \text{ V typ. (at } I_C = 50 \text{ A, } V_{GE} = 15 \text{ V, } T_a = 25^\circ\text{C)}$
- Built in fast recovery diode in one package
- Trench gate and thin wafer technology
- High speed switching
 $t_f = 80 \text{ ns typ. (at } V_{CC} = 300 \text{ V, } V_{GE} = 15 \text{ V, } I_C = 50 \text{ A, } R_g = 10 \Omega, T_j = 125^\circ\text{C, inductive load)}$

Outline

RENESAS Package code: PRSS0003ZH-A
 (Package name: TO-247A)



1. Gate
2. Collector
3. Emitter
4. Collector

Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

Item		Symbol	Ratings	Unit
Collector to emitter voltage / diode reverse voltage		V_{CES} / V_R	650	V
Gate to emitter voltage		V_{GES}	± 30	V
Collector current	$T_c = 25^\circ\text{C}$	I_C	100	A
	$T_c = 100^\circ\text{C}$	I_C	50	A
Collector to emitter diode forward current	$T_c = 25^\circ\text{C}$	I_{DF}	100	A
	$T_c = 100^\circ\text{C}$	I_{DF}	50	A
Collector dissipation		P_C ^{Note1}	378	W
Junction temperature		T_j	150	$^\circ\text{C}$
Storage temperature		T_{stg}	-55 to +150	$^\circ\text{C}$

Notes: 1. Value at $T_c = 25^\circ\text{C}$

Electrical Characteristics

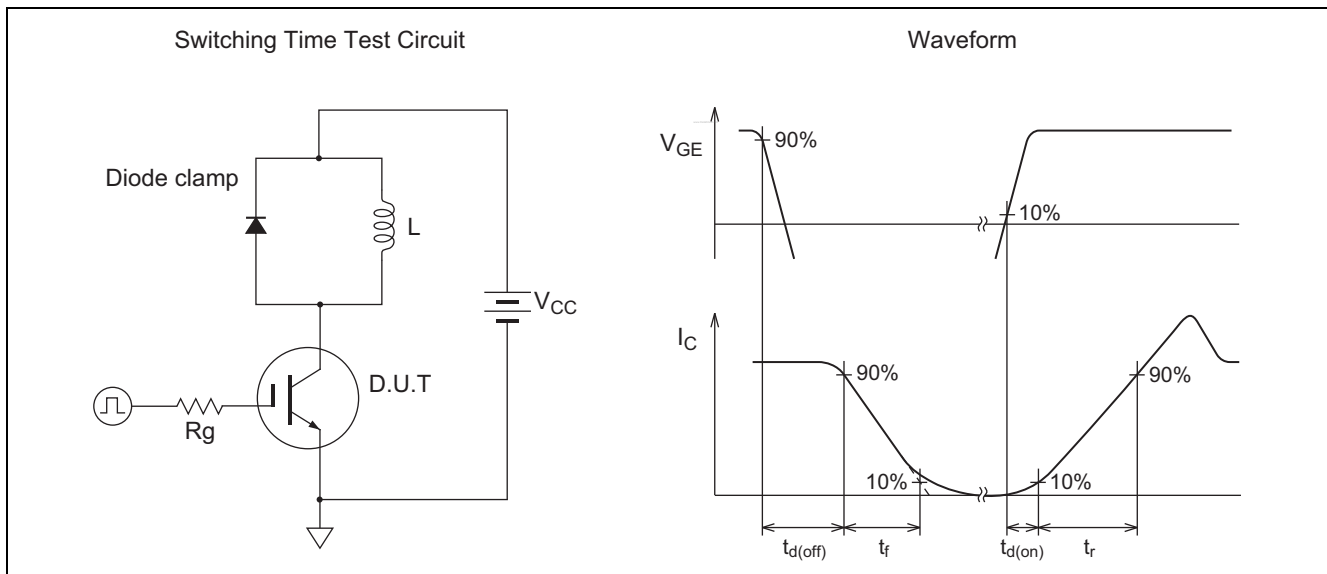
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector to emitter breakdown voltage	$V_{BR(CES)}$	650	—	—	V	$I_C = 10\ \mu A$, $V_{GE} = 0$
Zero gate voltage collector current / Diode reverse current	I_{CES} / I_R	—	—	1	μA	$V_{CE} = 650\ V$, $V_{GE} = 0$
Gate to emitter leak current	I_{GES}	—	—	± 1	μA	$V_{GE} = \pm 30\ V$, $V_{CE} = 0$
Gate to emitter cutoff voltage	$V_{GE(off)}$	5.0	—	6.8	V	$V_{CE} = 10\ V$, $I_C = 1\ mA$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	1.60	1.95	V	$I_C = 50\ A$, $V_{GE} = 15\ V$ ^{Note2}
Input capacitance	C_{ies}	—	4.5	—	nF	$V_{CE} = 25\ V$ $V_{GE} = 0$ $f = 1\ MHz$
Output capacitance	C_{oes}	—	0.2	—	nF	
Reveres transfer capacitance	C_{res}	—	0.15	—	nF	
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	$V_{CC} = 300\ V$, $V_{GE} = \pm 15\ V$ $I_C = 50\ A$, $R_g = 10\ \Omega$ $T_j = 125^\circ C$ (Inductive load) ^{Note3}
Rise time	t_r	—	30	—	ns	
Turn-off delay time	$t_{d(off)}$	—	200	—	ns	
Fall time	t_f	—	80	—	ns	
Short circuit withstand time	t_{sc}	10	—	—	μs	$V_{CC} \leq 360\ V$, $V_{GE} = 15\ V$ $T_j = 150^\circ C$

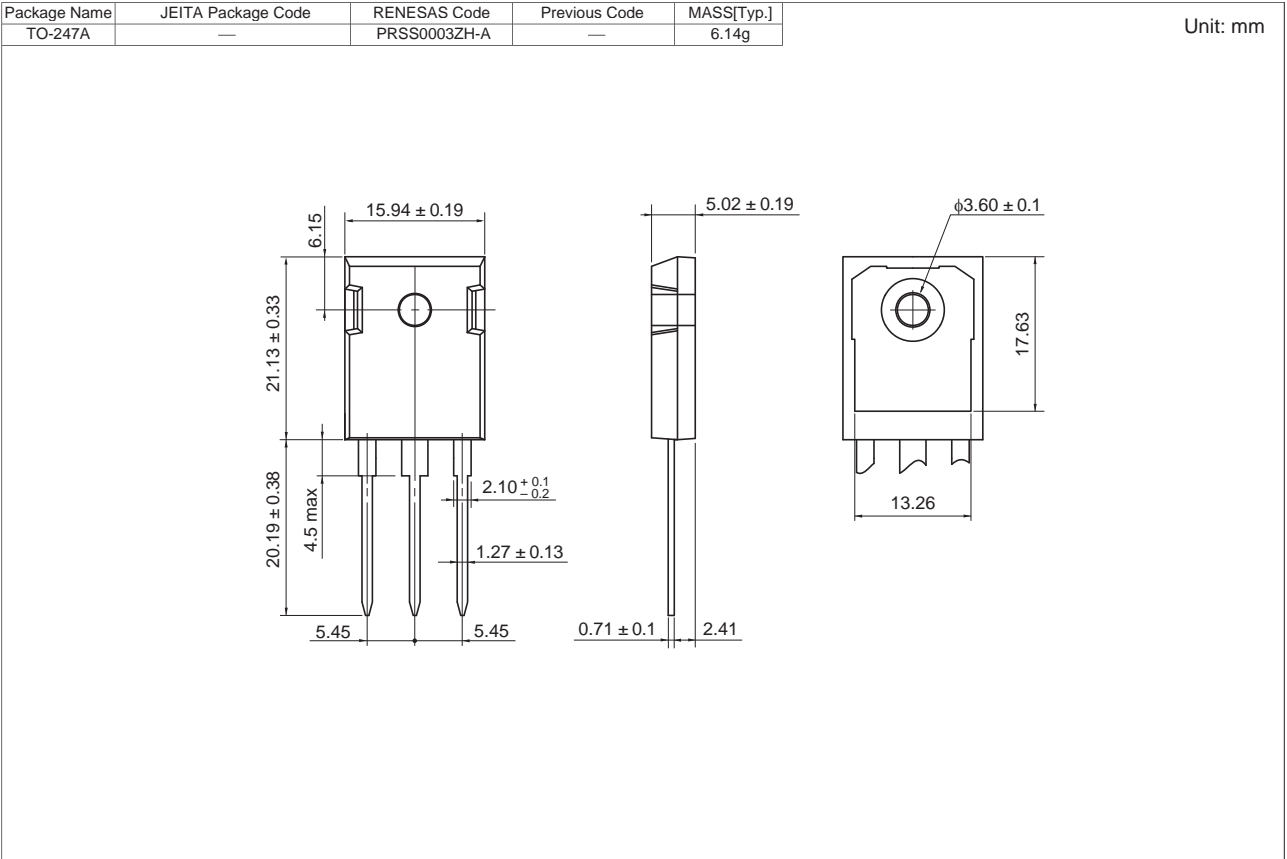
FRD forward voltage	V_F	—	1.7	—	V	$I_F = 50\ A$ ^{Note2}
FRD reverse recovery time	t_{rr}	—	90	—	ns	$I_F = 50\ A$, $di_F/dt = 1500\ A/\mu s$
	t_{rr}	—	180	—	ns	$I_F = 50\ A$, $di_F/dt = 100\ A/\mu s$

Notes: 2. Pulse test

3. Switching time test circuit and waveform are shown below.



Package Dimension



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