

RJP6016JPE

600 V - 40 A- N Channel IGBT
High Speed Power Switching

R07DS0878EJ0100

Rev.1.00

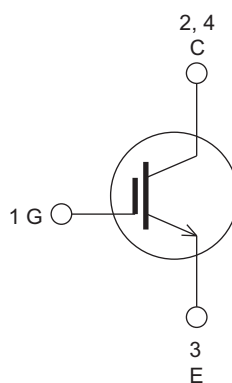
Sep 19, 2012

Features

- For Automotive application
- AEC-Q101 compliant
- Low collector to emitter saturation voltage.
 $V_{CE(sat)} = 1.7 \text{ V typ. (} I_C = 20 \text{ A, } V_{GE} = 15 \text{ V, } T_a = 25 \text{ }^\circ\text{C)}$

Outline

RENESAS Package code: PRSS0004AE-B
(Package name: LDPAK(S)-(1))



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

Absolute Maximum Ratings

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

Item	Symbol	Value	Unit	
Collector to emitter voltage	V_{CES}	600	V	
Gate to Emitter voltage	V_{GES}	± 20	V	
Collector current	$T_c = 25^\circ\text{C}$	I_C	40	A
	$T_c = 100^\circ\text{C}$	I_C	20	A
Collector peak current	$i_{C(peak)}$ ^{Note1}	80	A	
Collector power dissipation	P_C ^{Note2}	112	W	
Junction temperature	T_j	150	$^\circ\text{C}$	
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$	

Notes: 1. $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$

2. $T_c = 25^\circ\text{C}$

Thermal Impedance Characteristics

- Junction to case thermal impedance θ_{j-c} : 1.12°C/W

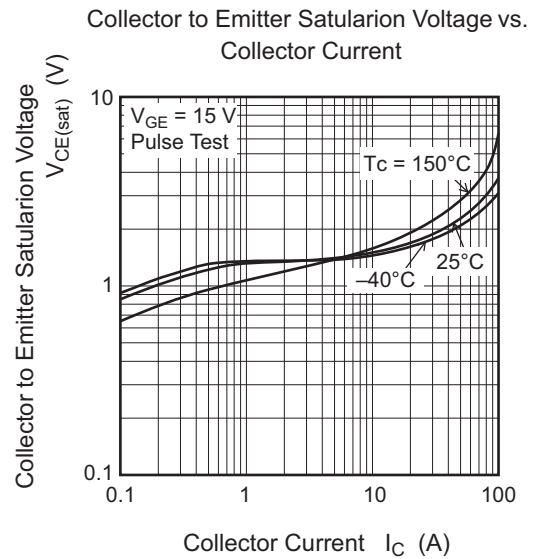
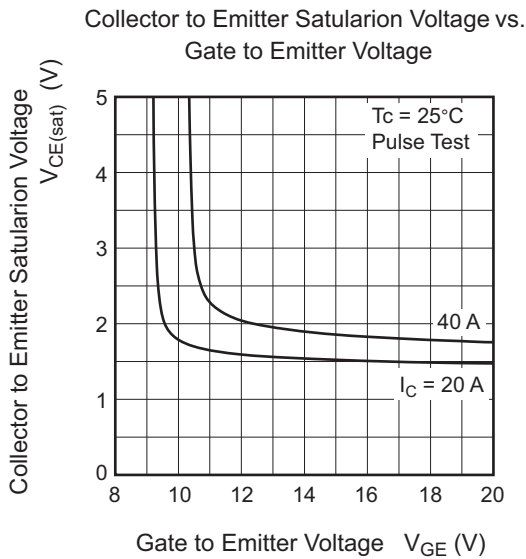
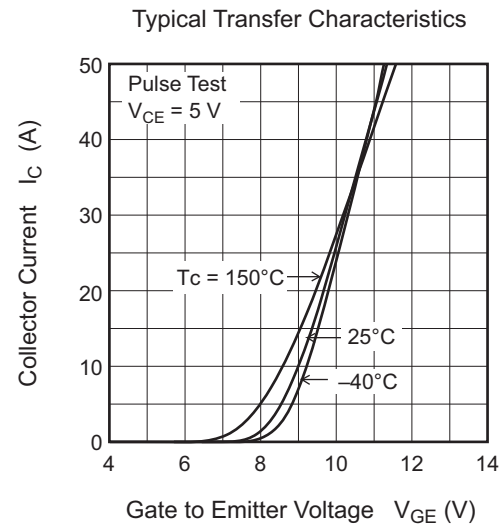
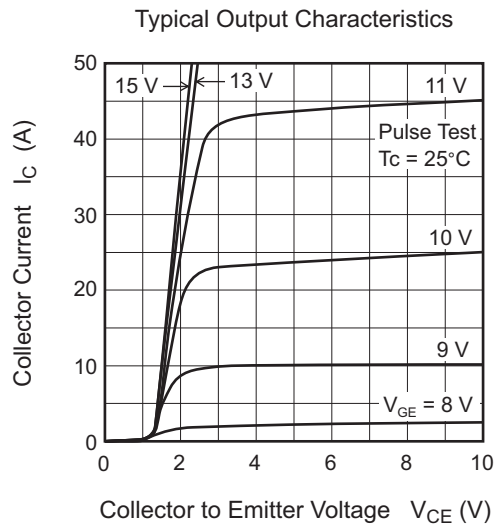
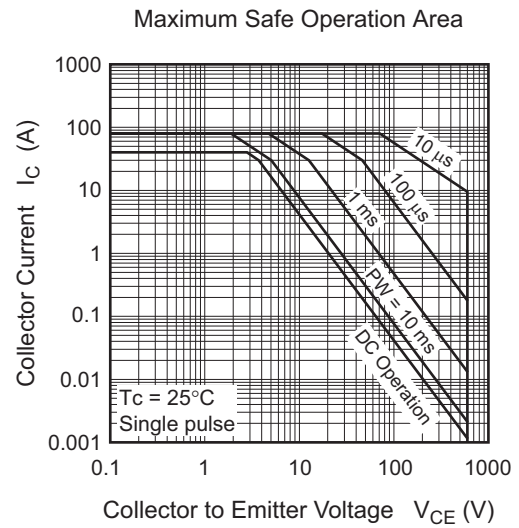
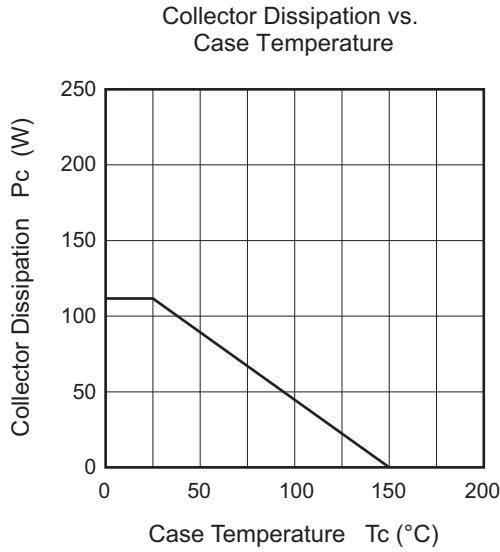
Electrical Characteristics

(Ta = 25°C)

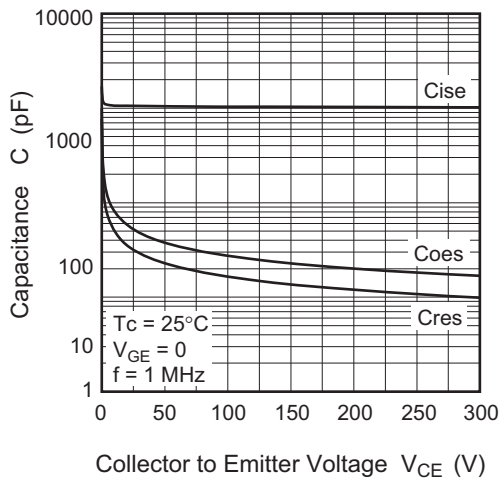
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I_{CES}	—	—	10	μA	$V_{CE} = 600 \text{ V}, V_{GE} = 0 \text{ V}$
Gate to emitter leak current	I_{GES}	—	—	± 1	μA	$V_{GE} = \pm 20 \text{ V}, V_{CE} = 0 \text{ V}$
Gate to emitter cutoff voltage	$V_{GE(\text{off})}$	6.0	7.0	8.0	V	$I_C = 20 \text{ mA}, V_{CE} = 10 \text{ V}$
Collector to emitter saturation voltage	$V_{CE(\text{sat})}$	—	1.7	2.1	V	$I_C = 20 \text{ A}, V_{GE} = 15 \text{ V}$ ^{Note3}
Input capacitance	C_{ies}	—	1100	—	pF	$V_{CE} = 25 \text{ V},$ $V_{GE} = 0$ $f = 1 \text{ MHz}$
Output capacitance	C_{oes}	—	55	—	pF	
Reverse transfer capacitance	C_{res}	—	35	—	pF	
Total gate charge	Q_g	—	47	—	nC	$V_{CE} = 300 \text{ V},$ $V_{GE} = 15 \text{ V},$ $I_C = 20 \text{ A}$
Gate to emitter charge	Q_{ge}	—	9	—	nC	
Gate to collector charge	Q_{gc}	—	22	—	nC	
Turn-on delay time	$t_{d(\text{on})}$	—	24	—	ns	$V_{CE} = 400 \text{ V},$ $I_C = 20 \text{ A},$ $V_{GE} = 15 \text{ V},$ $R_G = 10 \Omega$ (inductive load)
Rise time	t_r	—	12	—	ns	
Turn-off delay time	$t_{d(\text{off})}$	—	72	—	ns	
Fall time	t_f	—	90	—	ns	

Note: 3. Pulse test

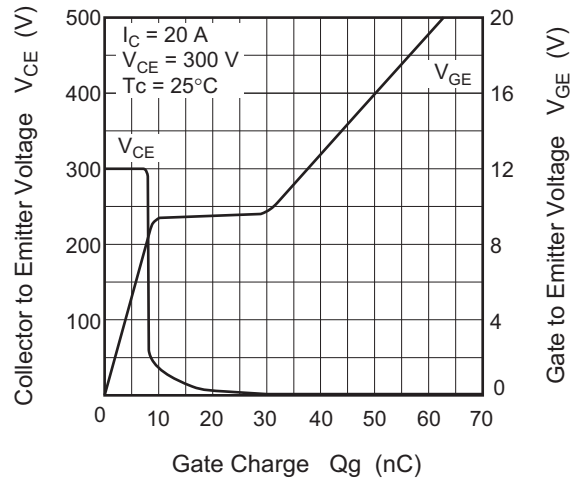
Main Characteristics



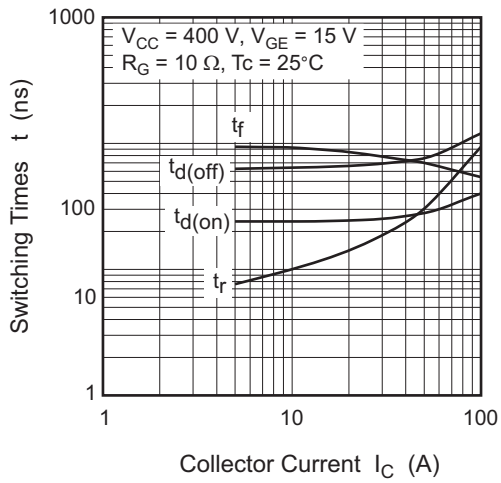
Typical Capacitance vs. Collector to Emitter Voltage



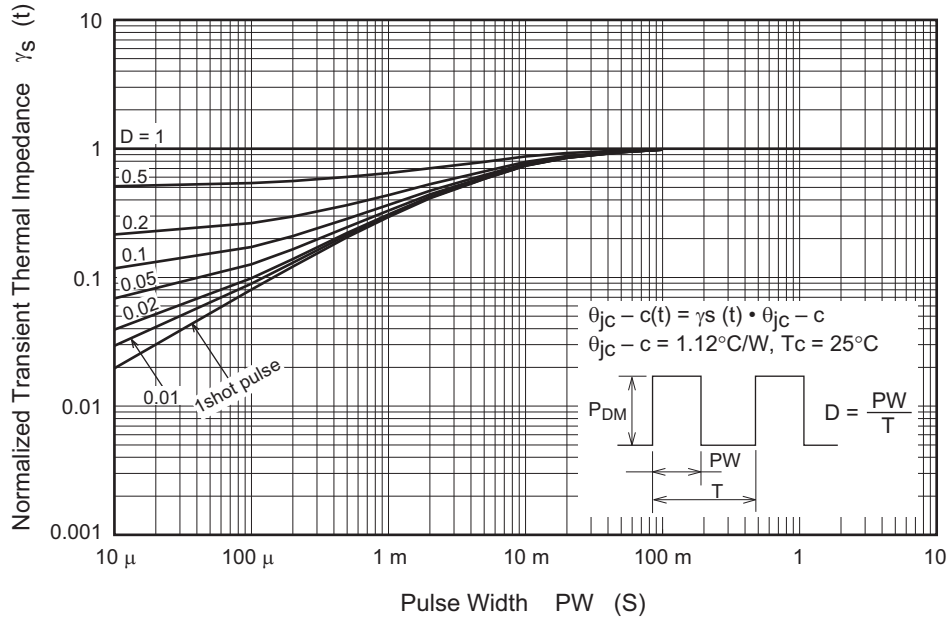
Dynamic Input Characteristics



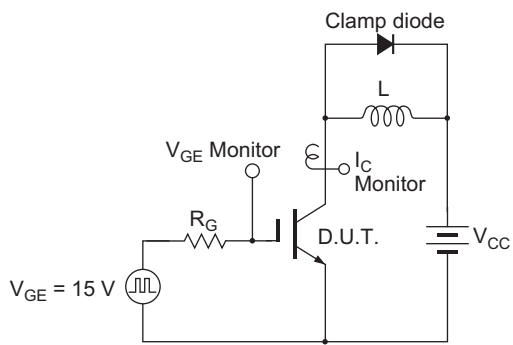
Switching Characteristics



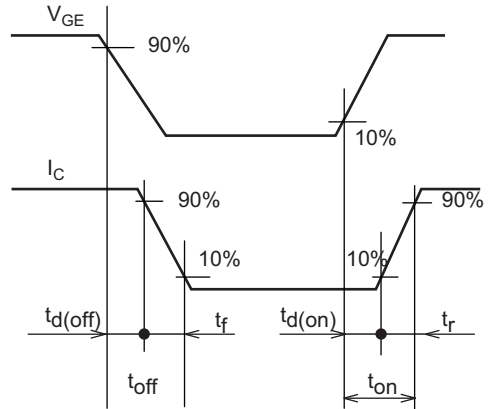
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



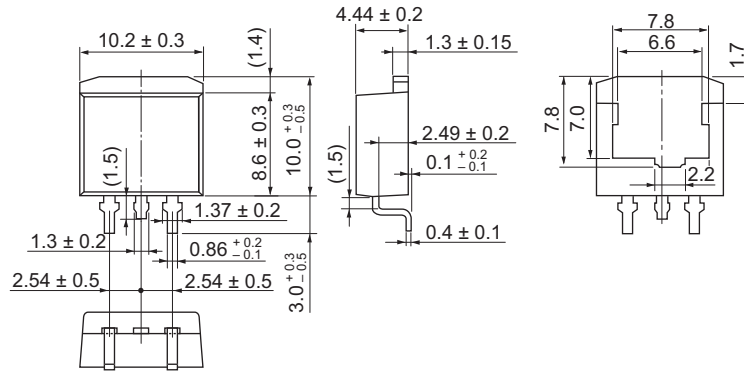
Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDBPAK(S)-(1)	SC-83	PRSS0004AE-B	LDBPAK(S)-(1) / LDBPAK(S)-(1)V	1.30g

Unit: mm



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJP6016JPE-00-J3	1000 pcs	Taping (Sinistrorse)

Note: The symbol of 2nd "-" is occasionally presented as "#".

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Renesas Electronics America Inc.
2880 Scott Boulevard Santa Clara, CA 95050-2554, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited
1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada
Tel: +1-905-898-5441, Fax: +1-905-898-3220

Renesas Electronics Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: +44-1628-651-700, Fax: +44-1628-651-804

Renesas Electronics Europe GmbH
Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-65030, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.
7th Floor, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100083, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.
Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd., Pudong District, Shanghai 200120, China
Tel: +86-21-5877-1818, Fax: +86-21-6887-7858 / -7898

Renesas Electronics Hong Kong Limited
Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2886-9318, Fax: +852 2886-9022/9044

Renesas Electronics Taiwan Co., Ltd.
13F, No. 363, Fu Shing North Road, Taipei, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

Renesas Electronics Singapore Pte. Ltd.
80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre Singapore 339949
Tel: +65-6213-0200, Fax: +65-6213-0300

Renesas Electronics Malaysia Sdn.Bhd.
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-3390, Fax: +60-3-7955-9510

Renesas Electronics Korea Co., Ltd.
11F., Samik Laved. or Bldg., 720-2 Yeoksam-Dong, Kangnam-Ku, Seoul 135-080, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141