Preliminary Information

DPI2100P45A5200

Press-Pack IGBT

DS6218-2 July 2018 (LN35909)

FEATURES

- Wide safe operating area
- 10µs short circuit withstand
- Outstanding thermal cycling capability
- All-IGBT configuration
- High tolerance of non-uniform clamping pressure

APPLICATIONS

- High voltage DC transmission
- Flexible AC transmission systems
- High reliability inverters
- Motor controllers

ORDERING INFORMATION

Order As:

DPI2100P45A5200

Note: When ordering, please use the complete part number

KEY PARAMETERS

V_{CES}		4500V
$V_{CE(sat)}$	(typ)	2.4V
I_C	(max)	2100A
$I_{C(PK)}$	(max)	4200A

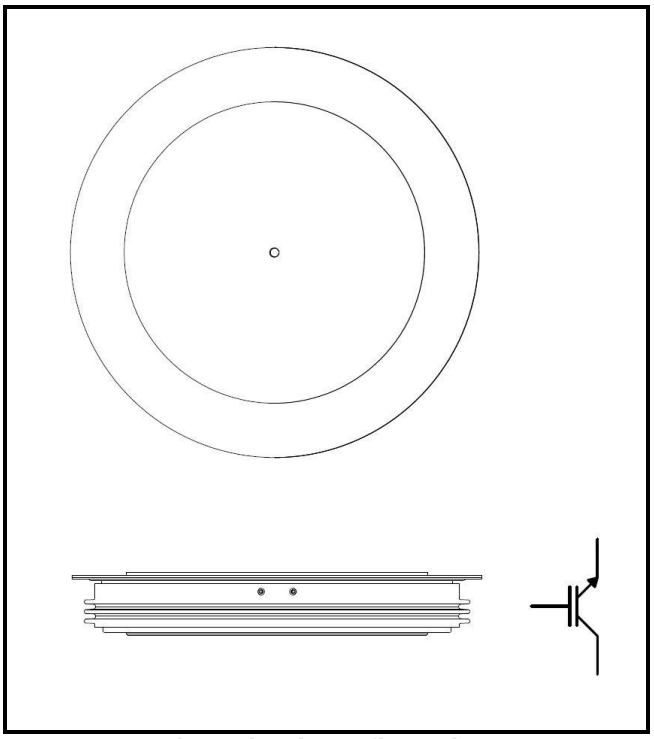

Fig.1 Circuit configuration

Outline type code: P
(See Fig. 9 for further information)

Fig. 2 Package

ABSOLUTE MAXIMUM RATINGS

Stresses above those listed under 'Absolute Maximum Ratings' may cause permanent damage to the device. In extreme conditions, as with all semiconductors, this may include potentially hazardous rupture of the package. Appropriate safety precautions should always be followed. Exposure to Absolute Maximum Ratings may affect device reliability.

T_{case} = 25°C unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
V_{CES}	Collector-emitter voltage	V_{GE} = 0V	4500	V
V_{GES}	Gate-emitter voltage	-	±20	V
I_C	Continuous collector current	T_{case} = 95°C	2100	A
$I_{C(PK)}$	Peak collector current	1ms, T_j = 125°C	4200	A
P_{max}	Max. transistor power dissipation	T_{case} = 25°C, T_j = 125°C	22.7	kW

THERMAL AND MECHANICAL RATINGS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
$R_{th(j-c)}$ *	Thermal resistance – junction to case (collector side)	DC	-	0.0044	°C/W
$R_{th(c-h)}$ *	Thermal resistance – case to heatsink (collector side)	Clamping force 70kN (with mounting compound)	-	0.0018	°C/W
T_{vj}	Virtual junction temperature	-	-	125	°C
T_{stg}	Storage temperature range	-	-40	125	°C
F_m	Clamping force	-	65	75	kN

Note:
* Heat transfer occurs primarily through the collector side of the device.

ELECTRICAL CHARACTERISTICS

T_{case} = 25°C unless stated otherwise.

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
I_{CES}	Collector cut-off current	V_{GE} = 0V, V_{CE} = V_{CES}			5	mA
		V_{GE} = 0V, V_{CE} = V_{CES}, T_{case} = 125°C		20	60	mA
I_{GES}	Gate leakage current	V_{GE} = ±20V, V_{CE} = 0V			10	µA
$V_{GE(TH)}$	Gate threshold voltage	I_C = 260mA, V_{GE} = V_{CE}		6.1		V
$V_{CE(sat)}$	Collector-emitter saturation voltage	V_{GE} = 15V, I_C = 2100A, T_j = 25°C		2.4		V
		V_{GE} = 15V, I_C = 2100A, T_j = 125°C		2.8		V
Q_g	Gate charge	V_{GE} = ±15V		38		µC
SC_{Data}	Short circuit current, I_{SC}	T_j = 125°C, V_{CC} = 3400V t_p ≤ 10µs, V_{GE} ≤ 15V $V_{CE\ (max)}$ = V_{CES} – L* x dI/dt IEC 60747-9		10000		A

Note:
* L is the circuit inductance

ELECTRICAL CHARACTERISTICS

T_{case} = 25°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
$t_{d(off)}$	Turn-off delay time	I_C = 2100A V_{GE} = ±15V V_{CE} = 2800V $R_{G(ON)}$ = 1.5Ω $R_{G(OFF)}$ = 4.7Ω C_{GE} = 330nF L_S ~ 220nH Freewheel diode type Dynex DPF2100P45A0052		4700		ns
t_f	Fall time			1900		ns
E_{OFF}	Turn-off energy loss			9900		mJ
$t_{d(on)}$	Turn-on delay time			760		ns
t_r	Rise time			420		ns
E_{ON}	Turn-on energy loss			6400		mJ

T_{case} = 125°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
$t_{d(off)}$	Turn-off delay time	I_C = 2100A V_{GE} = ±15V V_{CE} = 2800V $R_{G(ON)}$ = 1.5Ω $R_{G(OFF)}$ = 4.7Ω C_{GE} = 330nF L_S ~ 220nH Freewheel diode type Dynex DPF2100P45A0052		4800		ns
t_f	Fall time			2900		ns
E_{OFF}	Turn-off energy loss			11000		mJ
$t_{d(on)}$	Turn-on delay time			720		ns
t_r	Rise time			440		ns
E_{ON}	Turn-on energy loss			8800		mJ

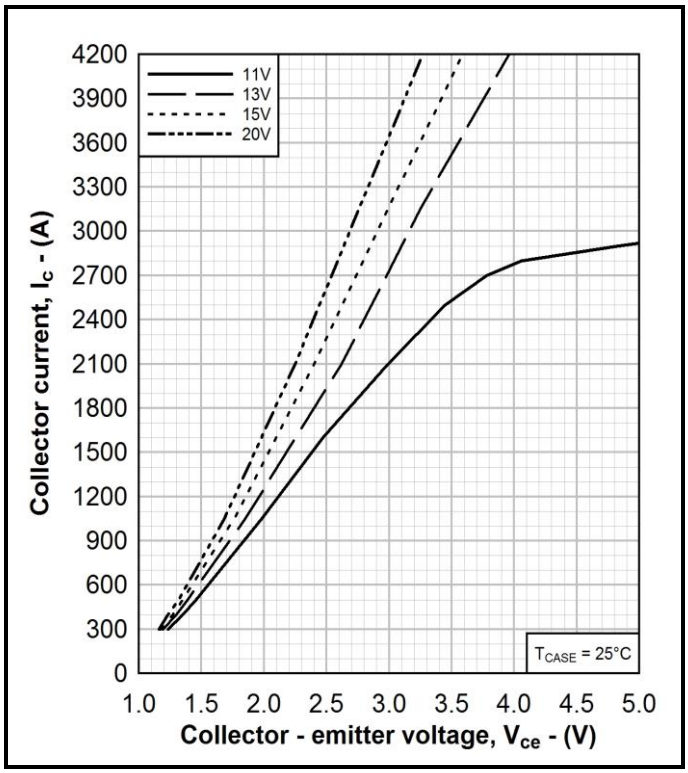

Fig. 3 Typical output characteristics

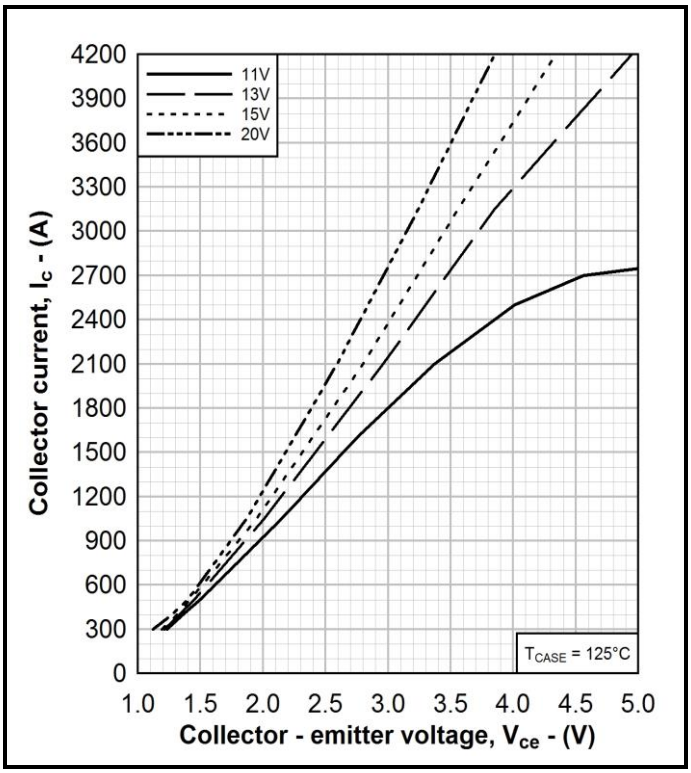

Fig. 4 Typical output characteristics

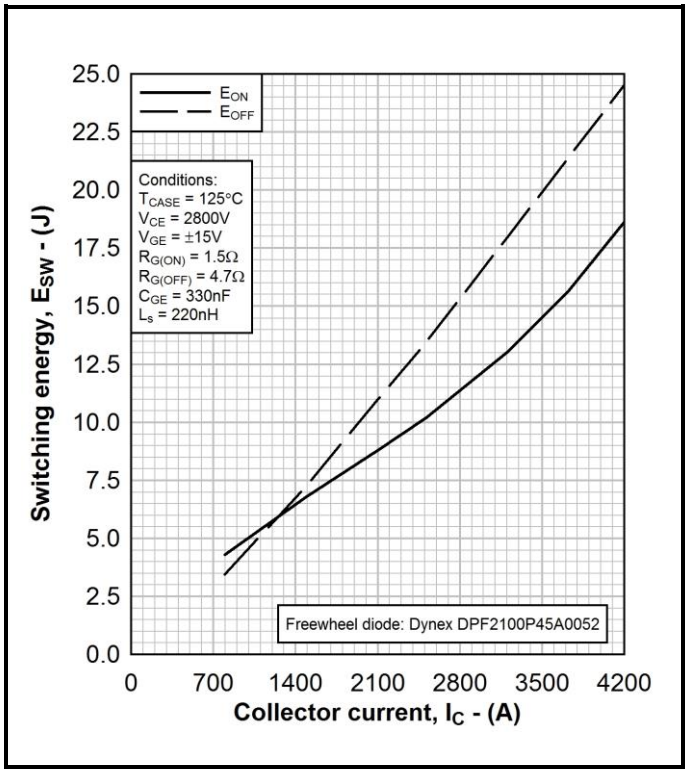

Fig. 5 Typical switching energy vs. collector current

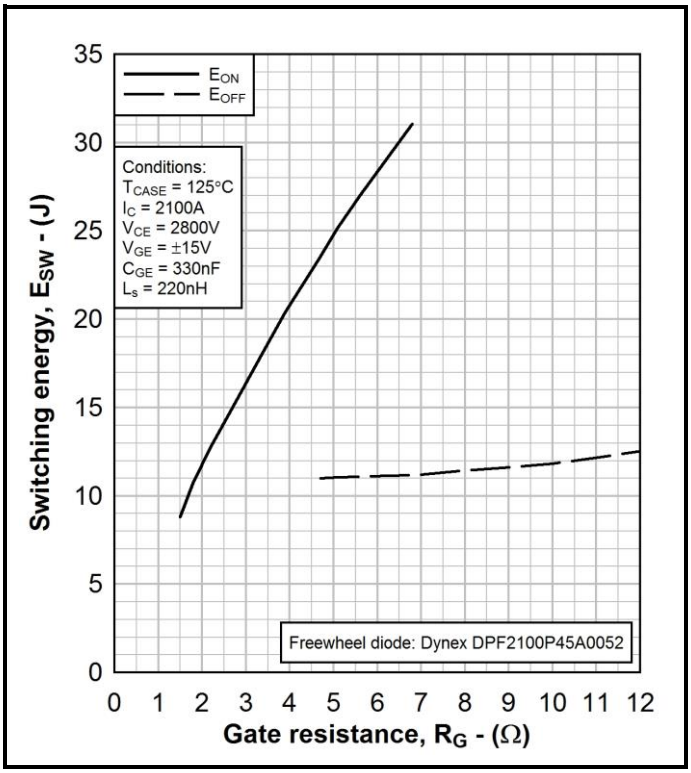

Fig. 6 Typical switching energy vs. gate resistance

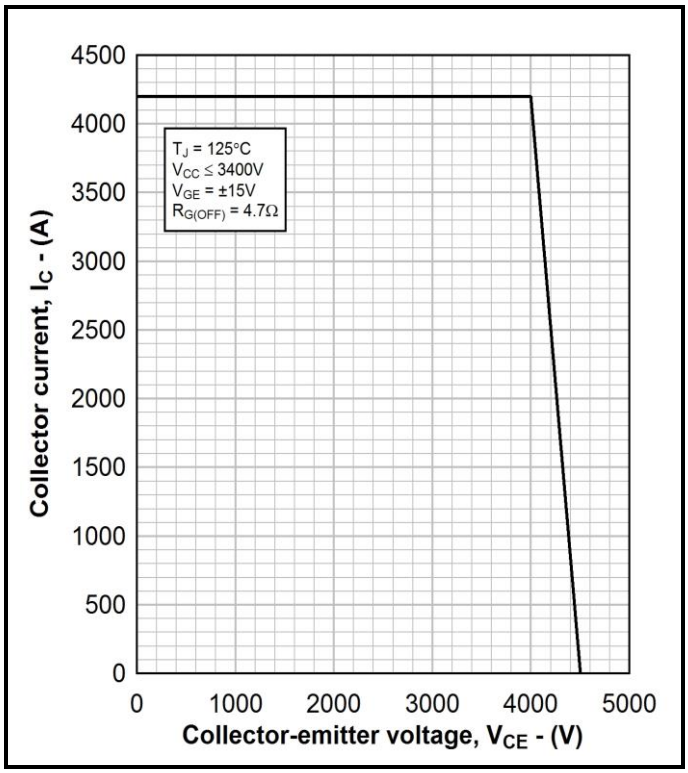

Fig. 7 Reverse bias safe operating area

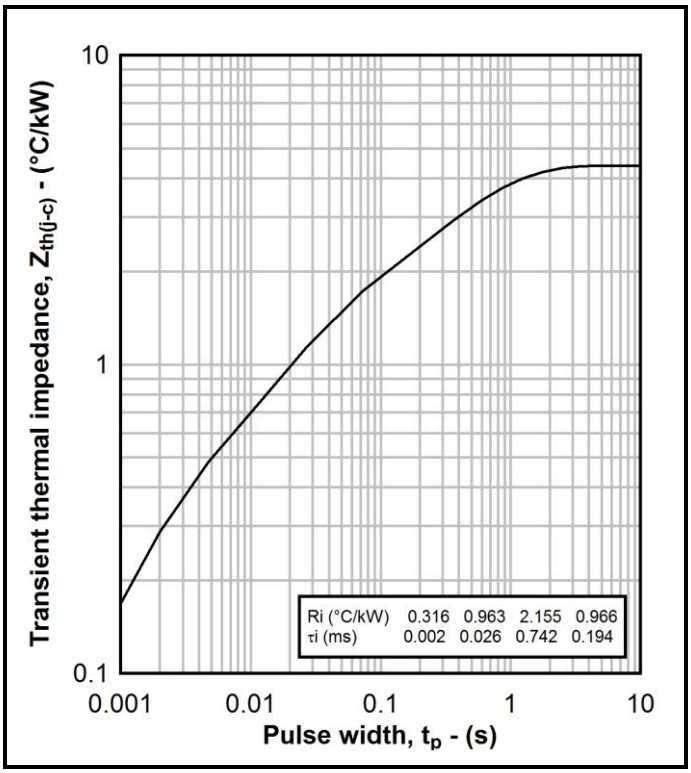

Fig. 8 Thermal impedance

PACKAGE DETAILS

For further package information, please visit our website or contact Customer Services.
All dimensions in mm, unless stated otherwise.

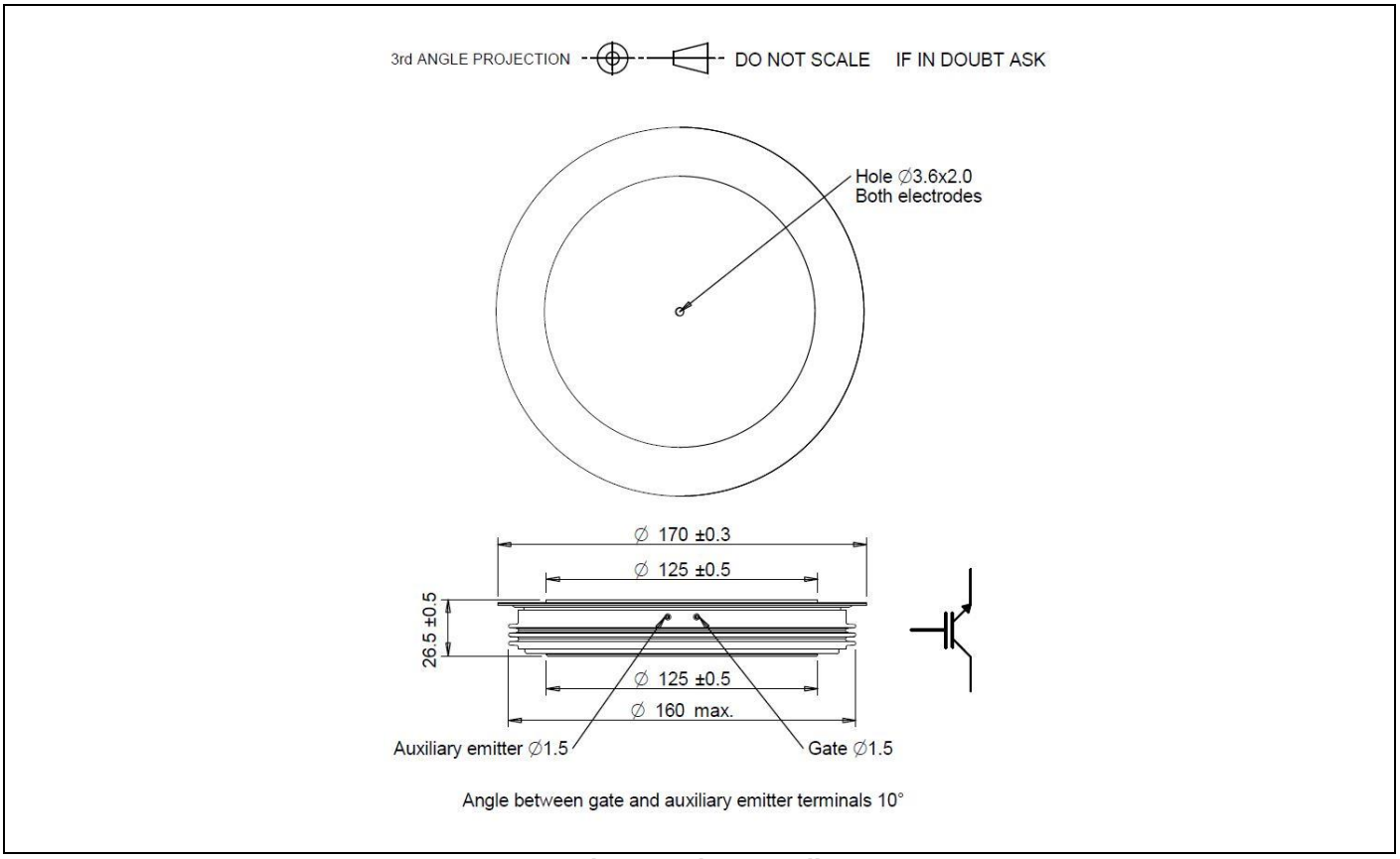

Fig. 9 Package outline

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