Preliminary Information

DPI1200P45C2626

Press-Pack FRD

DS6245-1 July 2018 (LN35904)

FEATURES

- Wide safe operating area
- 10µs short circuit withstand
- Outstanding thermal cycling capability
- Co-pack 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:

DPI1200P45C2626

Note: When ordering, please use the complete part number

KEY PARAMETERS

V_{CES}		4500V
$V_{CE(sat)}$	(typ)	2.6V
I_C	(max)	1200A
$I_{C(PK)}$	(max)	2400A

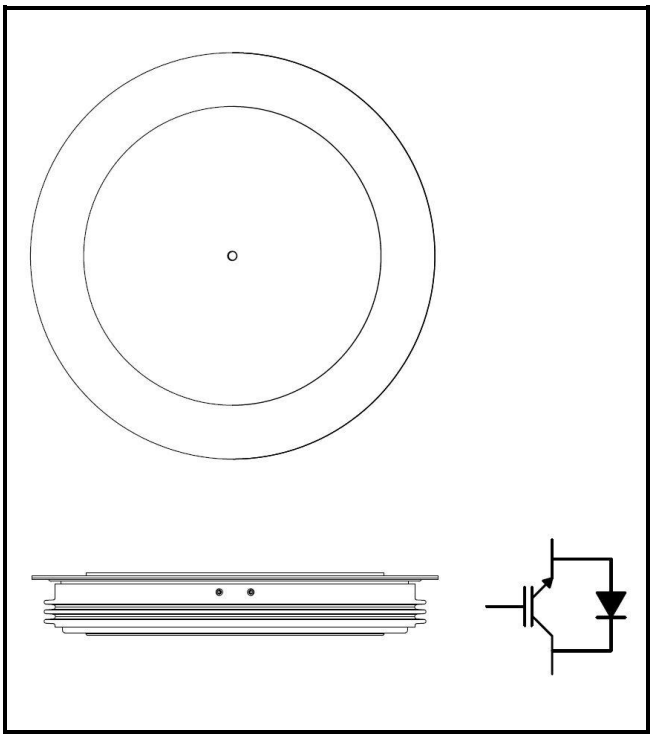

Fig.1 Circuit configuration

Outline type code: P
(See Fig. 11 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} = 90°C	1200	A
$I_{C(PK)}$	Peak collector current	1ms, T_j = 125°C	2400	A
P_{max}	Max. transistor power dissipation	T_{case} = 25°C, T_j = 125°C	11.4	kW
I_{FSM}	Surge (non-repetitive) on-state current	10ms half-sine, T_{case}=125°C, V_R=0V	20.4	kA

THERMAL AND MECHANICAL RATINGS

Symbol	Parameter	Test Conditions	Min.	Max.	Units
$R_{th(j-c)}$ *	Thermal resistance – junction to case IGBT (collector side)	DC	-	0.0088	°C/W
$R_{th(j-c)}$ *	Thermal resistance – junction to case Diode (cathode side)	DC	-	0.0088	°C/W
$R_{th(c-h)}$ *	Thermal resistance – case to heatsink IGBT (collector side)	Clamping force 70kN (with mounting compound)	-	0.0036	°C/W
$R_{th(c-h)}$ *	Thermal resistance – case to heatsink Diode (cathode side)	Clamping force 70kN (with mounting compound)	-	0.0036	°C/W
T_{vj}	Virtual junction temperature	Transistor	-	125	°C
		Diode	-	125	°C
T_{stg}	Storage temperature range	-	-40	125	°C
F_m	Clamping force	-	65	75	kN

Note:
* Device should be cooled from collector/cathode side only.

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		25	75	mA
I_{GES}	Gate leakage current	V_{GE} = ± 20V, V_{CE} = 0V			10	µA
$V_{GE(TH)}$	Gate threshold voltage	I_C = 130mA, V_{GE} = V_{CE}		6.1		V
$V_{CE(sat)}$	Collector-emitter saturation voltage	V_{GE} = 15V, I_C = 1200A, T_j = 25°C		2.6		V
		V_{GE} = 15V, I_C = 1200A, T_j = 125°C		3.0		V
I_F	Diode forward current	DC		1200		A
I_{FM}	Diode maximum forward current	t_p = 1ms		2400		A
V_F	Diode forward voltage	I_F = 1200A, T_j = 25°C		2.3		V
		I_F = 1200A, T_j = 125°C		2.4		V
Q_g	Gate charge	±15V		19		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		5000		A

Note:
* L is the circuit inductance

ELECTRICAL CHARACTERISTICS

T_{case} = 125°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
$t_{d(off)}$	Turn-off delay time	I_C = 1200A V_{GE} = ±15V V_{CE} = 2800V $R_{G(ON)}$ = 2.2Ω $R_{G(OFF)}$ = 10Ω C_{GE} = 150nF L_S ~ 220nH		4800		ns
t_f	Fall time			2900		ns
E_{OFF}	Turn-off energy loss			7000		mJ
$t_{d(on)}$	Turn-on delay time			400		ns
t_r	Rise time			400		ns
E_{ON}	Turn-on energy loss			5600		mJ
Q_{rr}	Diode reverse recovery charge	I_F = 1200A V_{CE} = 2800V dI_F/dt = 3500A/µs		2700		µC
I_{rr}	Diode reverse recovery current			1800		A
E_{rec}	Diode reverse recovery energy			5000		mJ

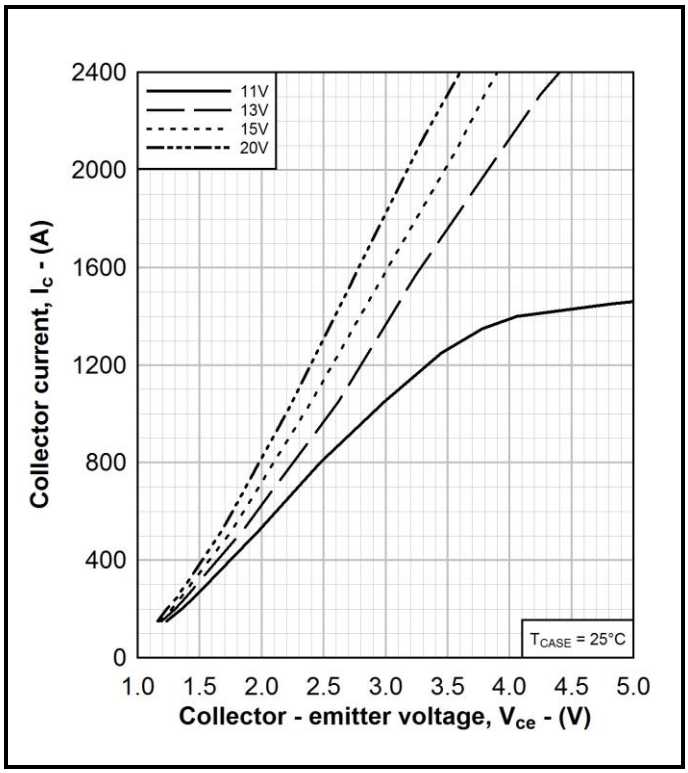

Fig. 3 Typical output characteristics

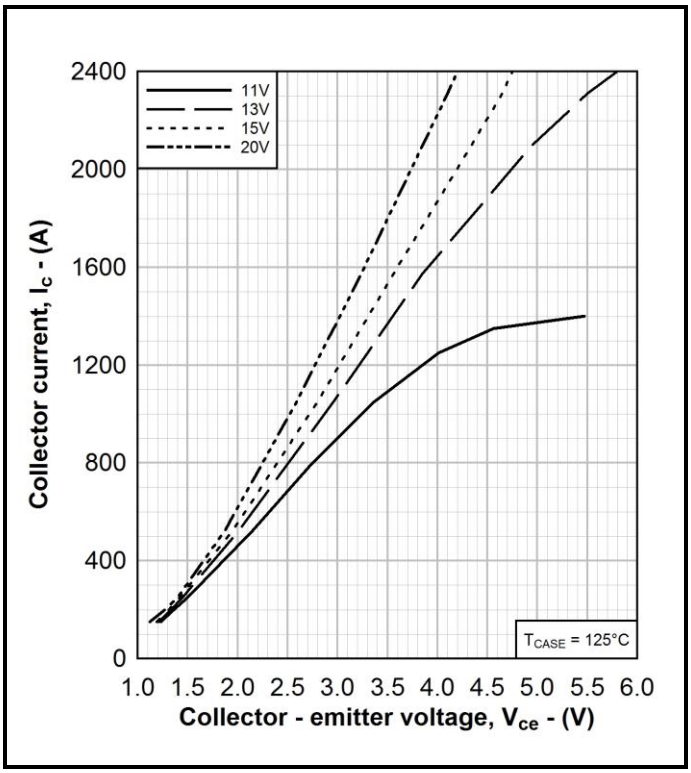

Fig. 4 Typical output characteristics

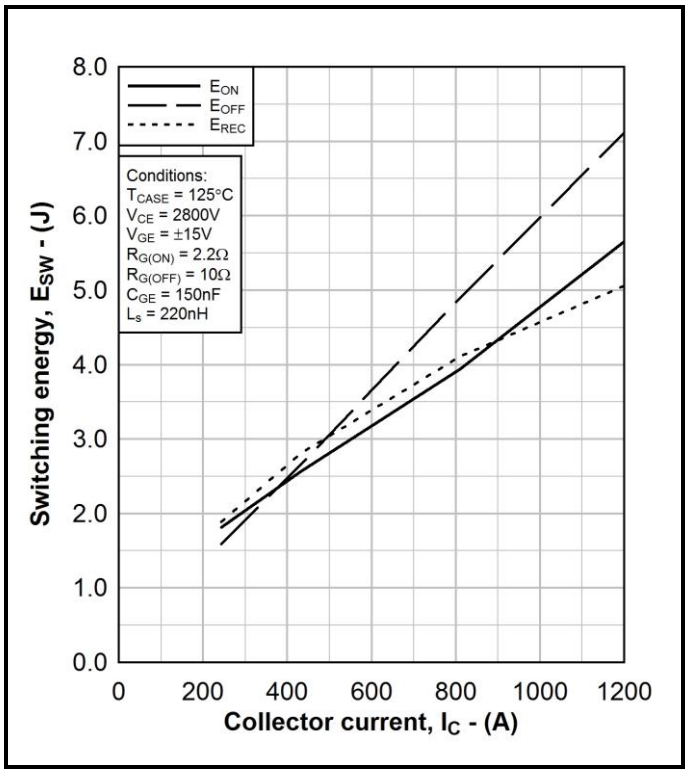

Fig. 5 Typical switching energy vs. collector current

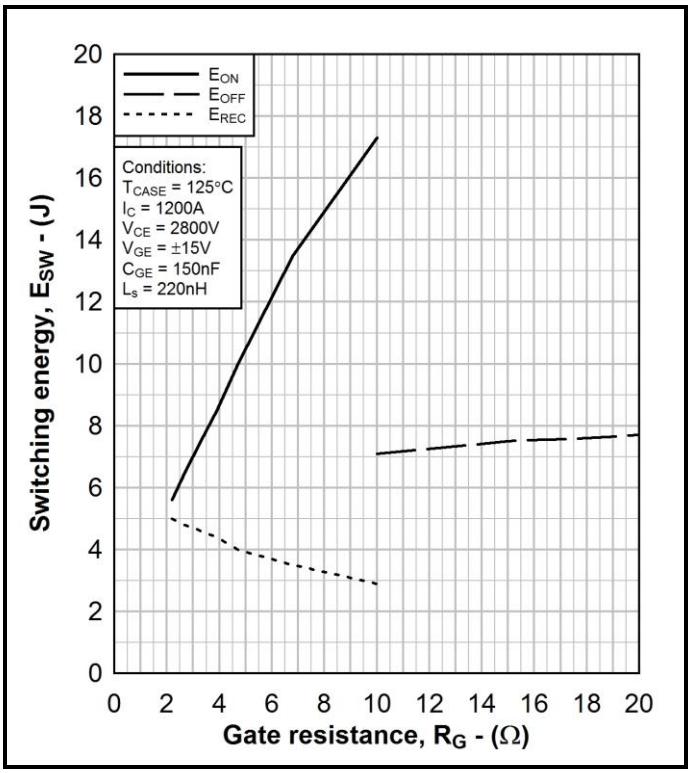

Fig. 6 Typical switching energy vs. gate resistance

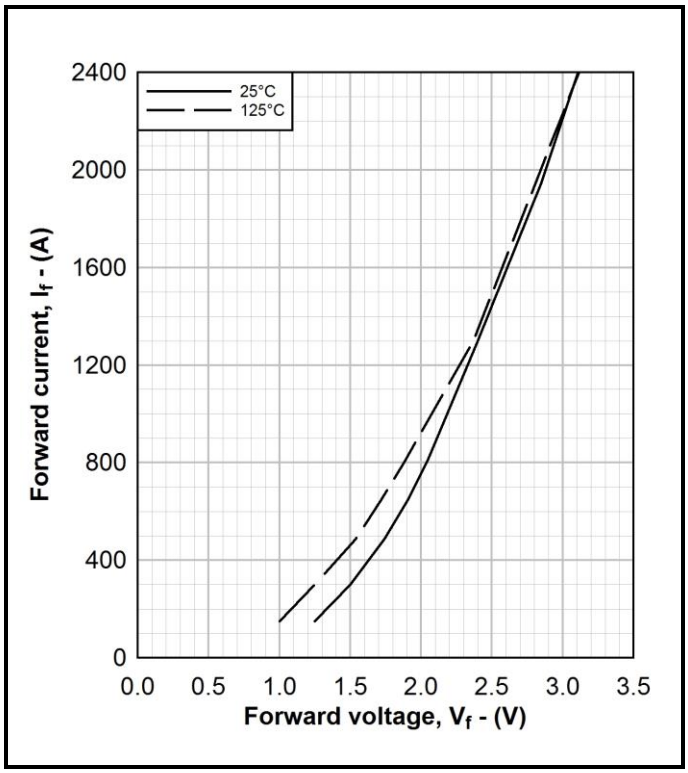

Fig. 7 Diode typical forward characteristics

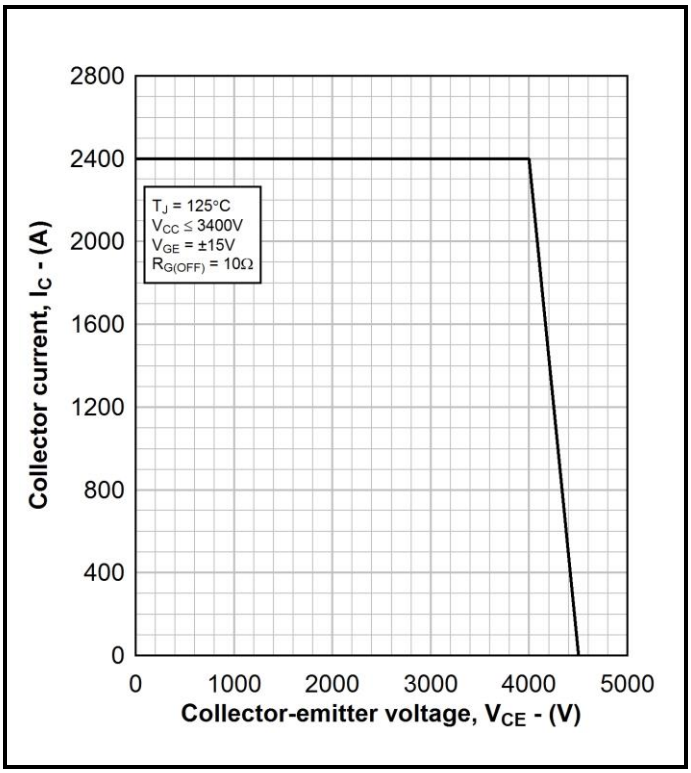

Fig. 8 Reverse bias safe operating area

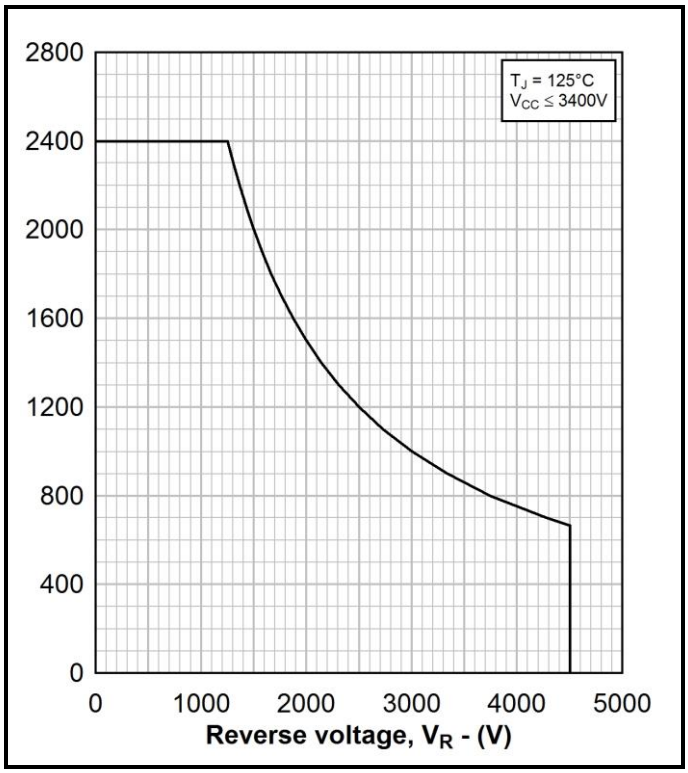

Fig. 9 Diode reverse bias safe operating area

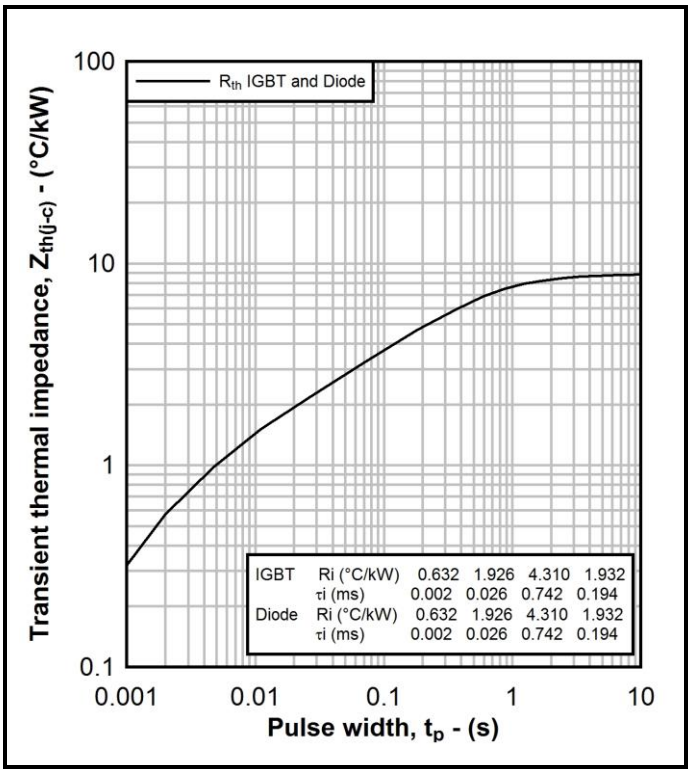

Fig. 10 Transient thermal impedance

PACKAGE DETAILS

For further package information, please visit our website or contact Customer Services.
All dimensions in mm, unless stated otherwise.
DO NOT SCALE.

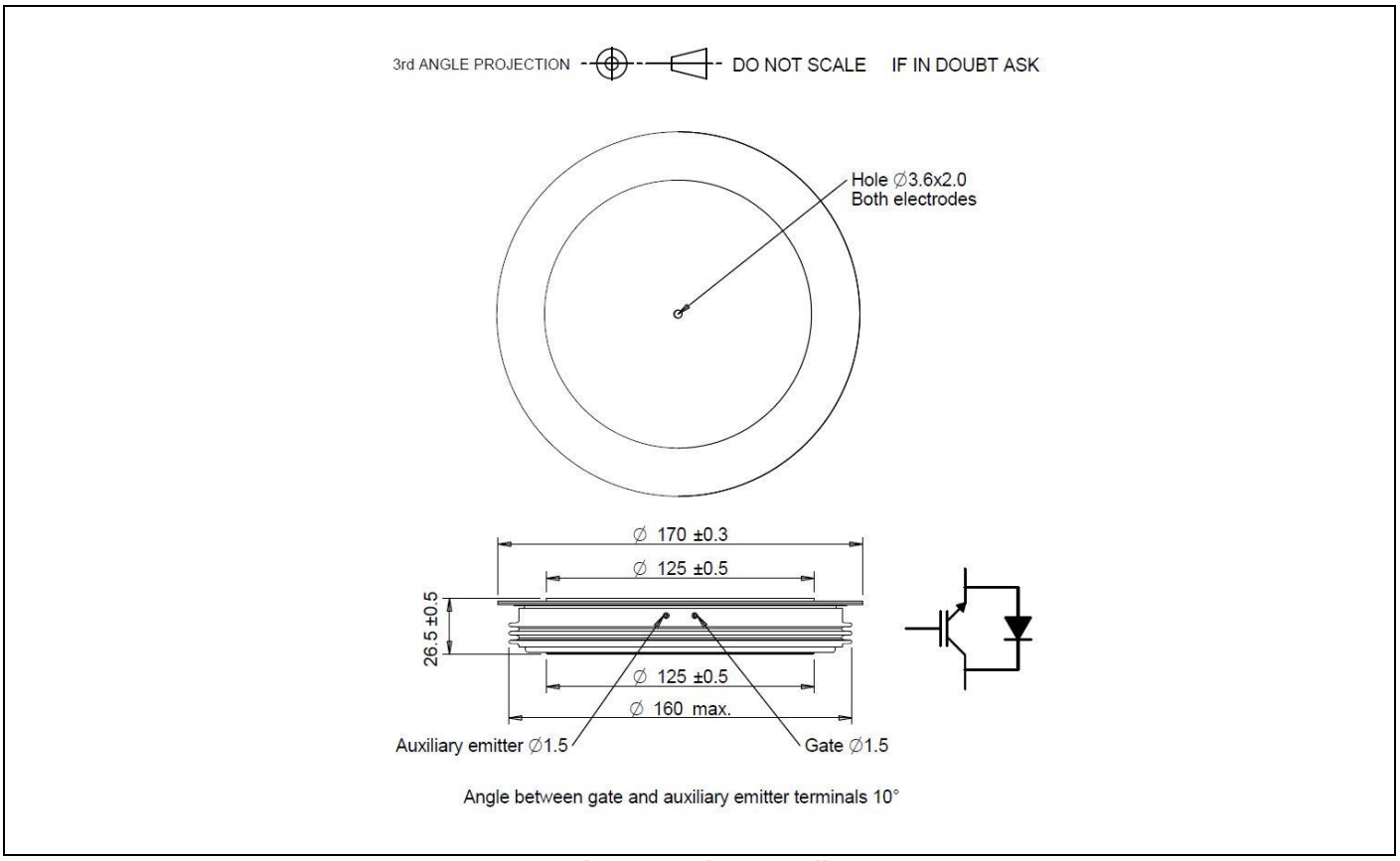

Fig. 11 Package outline

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