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Ultra fast low-loss controlled avalanche rectifiers

BYD71 series

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Available in ammo-pack.

Fig.1 Simplified outline (SOD91) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYD71A		–	50	V
	BYD71B		–	100	V
	BYD71C		–	150	V
	BYD71D		–	200	V
	BYD71E		–	250	V
	BYD71F		–	300	V
	BYD71G		–	400	V
V_R	continuous reverse voltage				
	BYD71A		–	50	V
	BYD71B		–	100	V
	BYD71C		–	150	V
	BYD71D		–	200	V
	BYD71E		–	250	V
	BYD71F		–	300	V
	BYD71G		–	400	V
$I_{F(AV)}$	average forward current	T_{tp} = 55 °C; lead length = 10 mm; see Figs 2 and 3; averaged over any 20 ms period; see also Figs 10 and 11			
	BYD71A to D		–	0.56	A
	BYD71E to G		–	0.54	A
$I_{F(AV)}$	average forward current	T_{amb} = 60 °C; PCB mounting (see Fig.16); see Figs 4 and 5; averaged over any 20 ms period; see also Figs 10 and 11			
	BYD71A to D		–	0.43	A
	BYD71E to G		–	0.41	A

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{FRM}	repetitive peak forward current	T_{tp} = 55 °C; see Figs 6 and 7			
	BYD71A to D		–	4.7	A
	BYD71E to G		–	5.0	A
I_{FRM}	repetitive peak forward current	T_{amb} = 60 °C; see Figs 8 and 9			
	BYD71A to D		–	3.7	A
	BYD71E to G		–	3.9	A
I_{FSM}	non-repetitive peak forward current	t = 10 ms half sine wave; $T_j = T_{j\,max}$ prior to surge; $V_R = V_{RRMmax}$	–	7	A
P_{RSM}	non-repetitive peak reverse power dissipation	t = 20 µs half sine wave; $T_j = T_{j\,max}$ prior to surge			
	BYD71A to D		–	250	W
	BYD71E to G		–	150	W
T_{stg}	storage temperature		−65	+175	°C
T_j	junction temperature		−65	+175	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 0.5 A; $T_j = T_{j\,max}$; see Figs 12 and 13				
	BYD71A to D		–	–	0.84	V
	BYD71E to G		–	–	0.90	V
V_F	forward voltage	I_F = 0.5 A; see Figs 12 and 13				
	BYD71A to D		–	–	1.05	V
	BYD71E to G		–	–	1.11	V
$V_{(BR)R}$	reverse avalanche breakdown voltage	I_R = 0.1 mA				
	BYD71A		55	–	–	V
	BYD71B		110	–	–	V
	BYD71C		165	–	–	V
	BYD71D		220	–	–	V
	BYD71E		275	–	–	V
	BYD71F		330	–	–	V
	BYD71G		440	–	–	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Fig 14	–	–	1	µA
		$V_R = V_{RRMmax}$; T_j = 165 °C; see Fig 14	–	–	75	µA
t_{rr}	reverse recovery time	when switched from I_F = 0.5 A to I_R = 1 A; measured at I_R = 0.25 A see Fig 18				
	BYD71A to D		–	–	25	ns
	BYD71E to G		–	–	50	ns

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
C_d	diode capacitance	f = 1 MHz; V_R = 0 V; see Fig.15				
	BYD71A to D		–	25	–	pF
	BYD71E to G		–	20	–	pF
$\left\|\frac{dI_R}{dt}\right\|$	maximum slope of reverse recovery current	when switched from I_F = 1 A to $V_R \geq 30$ V and dI_F/dt = –1 A/µs; see Fig.17				
	BYD71A to D		–	–	4	A/µs
	BYD71E to G		–	–	5	A/µs

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point	lead length = 10 mm	180	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	250	K/W