Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

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Email & Skype: info@chipsmall.com Web: www.chipsmall.com
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IGBT (NPT) Module

V_{CES} = 1200V
I_{C25} = 160A
$V_{CE(sat)}$ = 2.2V

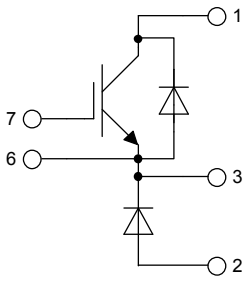
Buck Chopper + free wheeling Diode

Part number

MDI145-12A3

Backside: isolated

E72873



Features / Advantages:

- NPT IGBT technology
- low saturation voltage
- low switching losses
- switching frequency up to 30 kHz
- square RBSOA, no latch up
- high short circuit capability
- positive temperature coefficient for easy parallelling
- MOS input, voltage controlled
- ultra fast free wheeling diodes

Applications:

- AC motor drives
- Solar inverter
- Medical equipment
- Uninterruptible power supply
- Air-conditioning systems
- Welding equipment
- Switched-mode and resonant-mode power supplies
- Inductive heating, cookers
- Pumps, Fans

Package: Y4

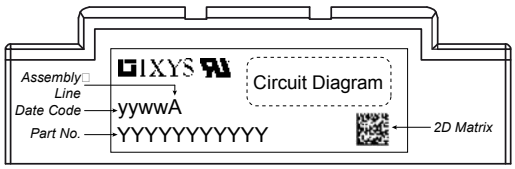
- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

Free Wheeling Diode FWD				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
I_R	*reverse current, drain current*	V_R = 1200 V	T_{VJ} = 25°C			1	mA
		V_R = 1200 V	T_{VJ} = 125°C			3	mA
V_F	*forward voltage drop*	I_F = 100 A	T_{VJ} = 25°C			2.60	V
		I_F = 200 A				3.10	V
		I_F = 100 A	T_{VJ} = 125°C			2.00	V
		I_F = 200 A				2.40	V
I_{FAV}	*average forward current*	T_C = 80°C	T_{VJ} = 150°C			95	A
		DC current d = 1					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			1.30	V
r_F	*slope resistance* }					7.5	mΩ
R_{thJC}	*thermal resistance junction to case*					0.18	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.18		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			700	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			700	A
C_J	*junction capacitance*	V_R = 600 V f = 1 MHz	T_{VJ} = 25°C		30		pF

Buck IGBT				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{CES}	*collector emitter voltage*		T_{VJ} = 25°C			1200	V
V_{GES}	*max. DC gate voltage*					±20	V
V_{GEM}	*max. transient gate emitter voltage*					±30	V
I_{C25}	*collector current*		T_C = 25°C			160	A
I_{C80}			T_C = 80°C			110	A
P_{tot}	*total power dissipation*		T_C = 25°C			700	W
$V_{CE(sat)}$	*collector emitter saturation voltage*	I_C = 100A; V_{GE} = 15 V	T_{VJ} = 25°C		2.2	2.7	V
			T_{VJ} = 125°C		2.7		V
$V_{GE(th)}$	*gate emitter threshold voltage*	I_C = 4mA; V_{GE} = V_{CE}	T_{VJ} = 25°C	4.5	5.5	6.5	V
I_{CES}	*collector emitter leakage current*	V_{CE} = V_{CES}; V_{GE} = 0 V	T_{VJ} = 25°C			6	mA
			T_{VJ} = 125°C		9		mA
I_{GES}	*gate emitter leakage current*	V_{GE} = ±20 V				400	nA
$Q_{G(on)}$	*total gate charge*	V_{CE} = 600 V; V_{GE} = 15 V; I_C = 100 A			480		nC
$t_{d(on)}$	*turn-on delay time*				100		ns
t_r	*current rise time*				60		ns
$t_{d(off)}$	*turn-off delay time*	inductive load	T_{VJ} = 125°C		600		ns
t_f	*current fall time*	V_{CE} = 600 V; I_C = 100 A			90		ns
E_{on}	*turn-on energy per pulse*	V_{GE} = ±15 V; R_G = 6.8 Ω			16		mJ
E_{off}	*turn-off energy per pulse*				15		mJ
RBSOA	*reverse bias safe operating area*	V_{GE} = ±15 V; R_G = 6.8 Ω	T_{VJ} = 125°C				
I_{CM}		V_{CEmax} = 1200 V				200	A
SCSOA	*short circuit safe operating area*	V_{CEmax} = 1200 V					
t_{SC}	*short circuit duration*	V_{CE} = 1200 V; V_{GE} = ±15 V	T_{VJ} = 125°C			10	µs
I_{SC}	*short circuit current*	R_G = 6.8 Ω; non-repetitive			330		A
R_{thJC}	*thermal resistance junction to case*					0.18	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.18		K/W

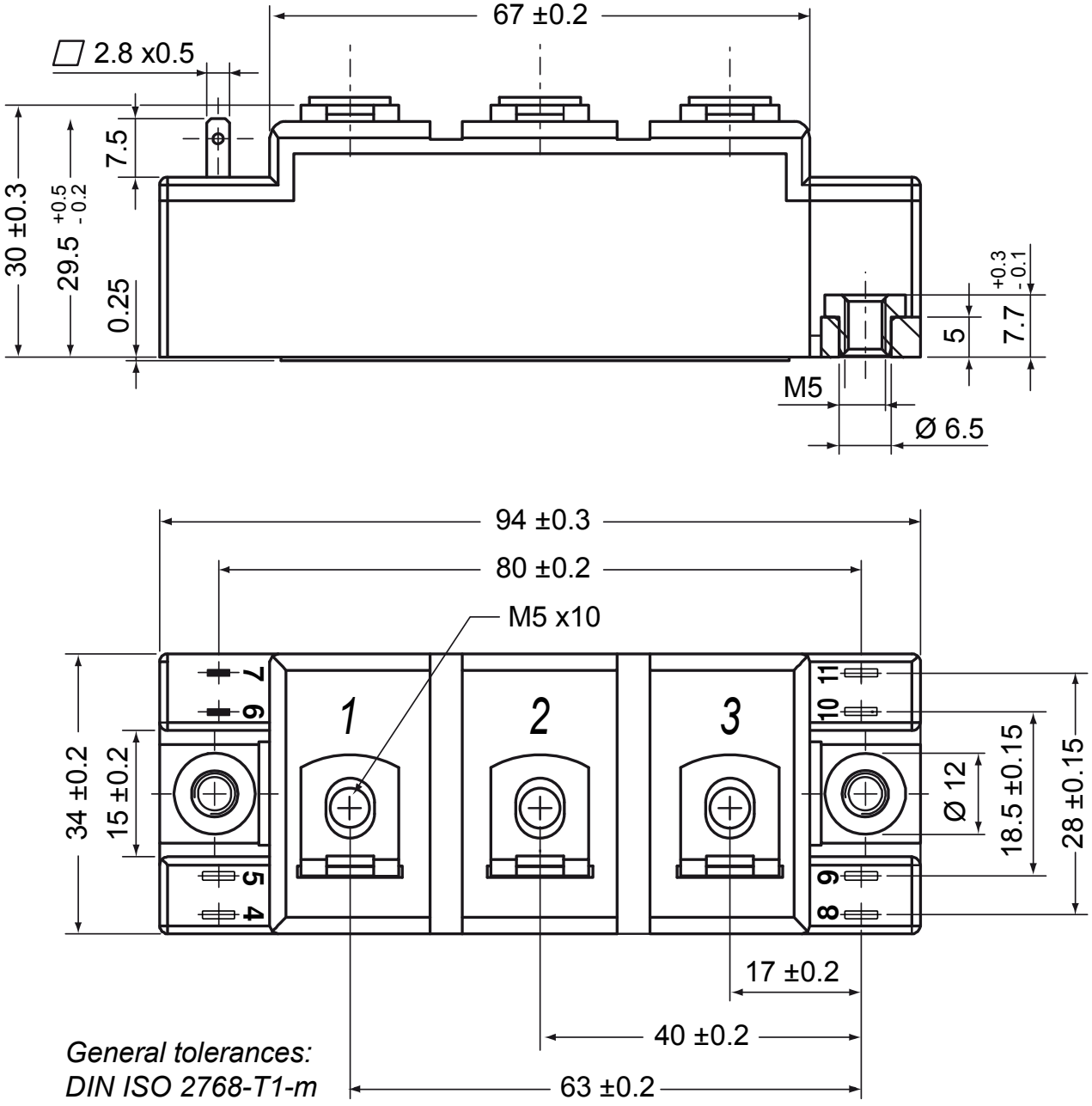
Buck Diode BD							
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			1200	V
I_{F25}	*forward current*		T_C = 25°C			150	A
I_{F80}			T_C = 80°C			95	A
V_F	*forward voltage*	I_F = 100A	T_{VJ} = 25°C			2.60	V
			T_{VJ} = 125°C		1.90		V
I_R	*reverse current*	V_R = V_{RRM}	T_{VJ} = 25°C			1	mA
			T_{VJ} = 125°C		1.5		mA
Q_{rr}	*reverse recovery charge*				8.5		µC
I_{RM}	*max. reverse recovery current*	V_R = 600 V			62		A
t_{rr}	*reverse recovery time*	-di_F/dt = 600 A/µs	T_{VJ} = 125°C		200		ns
E_{rec}	*reverse recovery energy*	I_F = 100A; V_{GE} = 0 V			1.5		mJ
R_{thJC}	*thermal resistance junction to case*					0.45	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.45		K/W

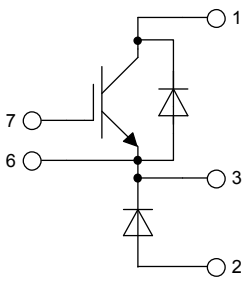
Package Y4					Ratings			
Symbol	Definition	Conditions			min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal					300	A
T_{VJ}	*virtual junction temperature*				-40		150	°C
T_{op}	*operation temperature*				-40		125	°C
T_{stg}	*storage temperature*				-40		125	°C
Weight						108		g
M_D	*mounting torque*				2.25		2.75	Nm
M_T	*terminal torque*				4.5		5.5	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	14.0	10.0			mm
$d_{Spb/Apb}$			*terminal to backside*	16.0	16.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA		3600			V
		t = 1 minute			3000			V



Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDI145-12A3	MDI145-12A3	Box	6	474223

Outlines Y4





Buck IGBT

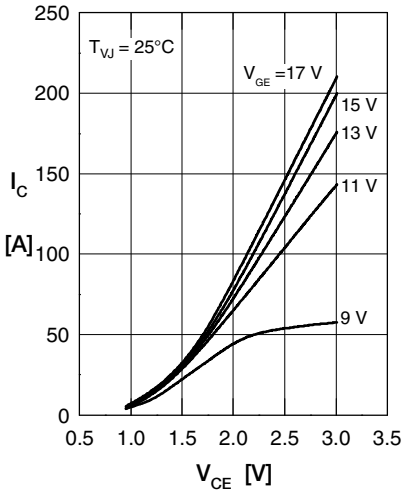


Fig. 1 Typ. output characteristics

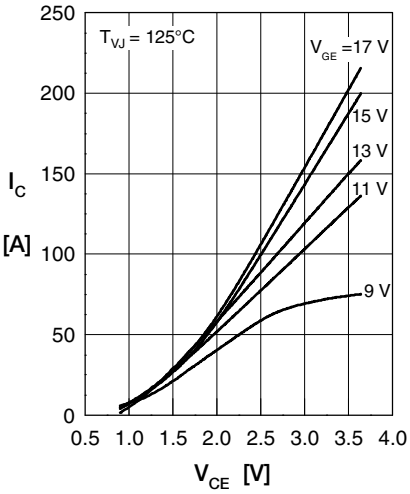


Fig. 2 Typ. output characteristics

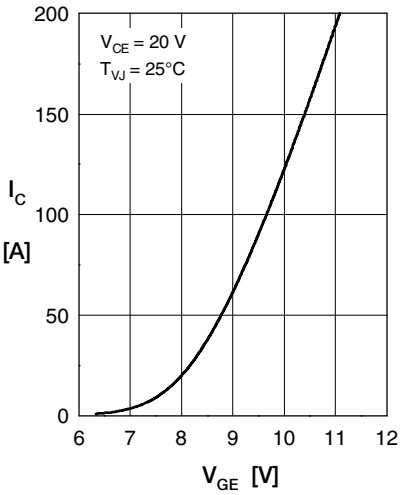


Fig. 3 Typ. transfer characteristics

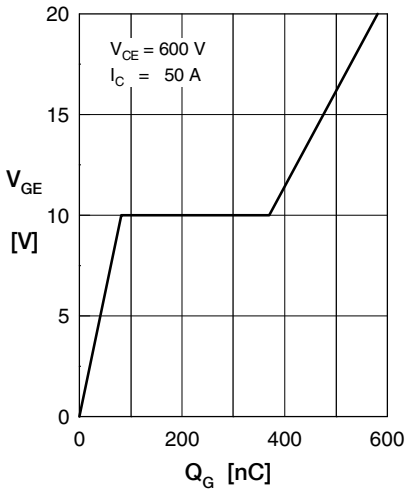


Fig. 4 Typ. turn-on gate charge

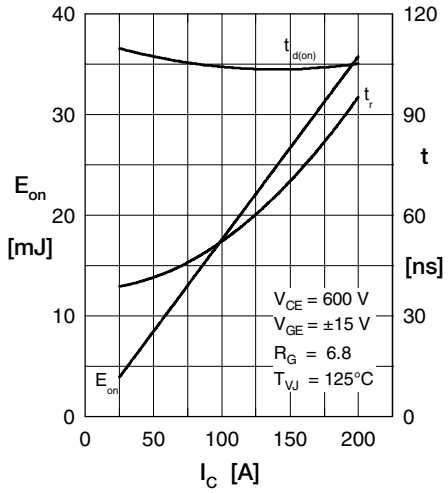


Fig. 5 Typ. turn on energy & switching times versus collector current

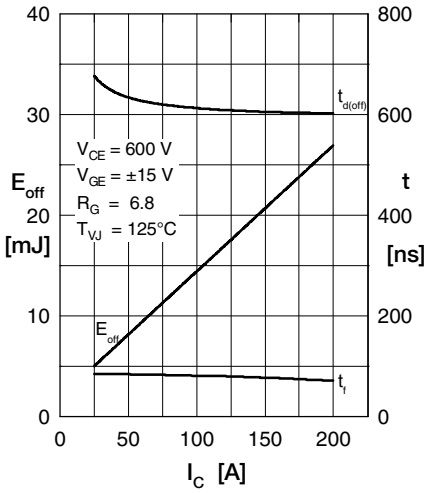


Fig.6 Typ. turn off energy & switching times versus collector current

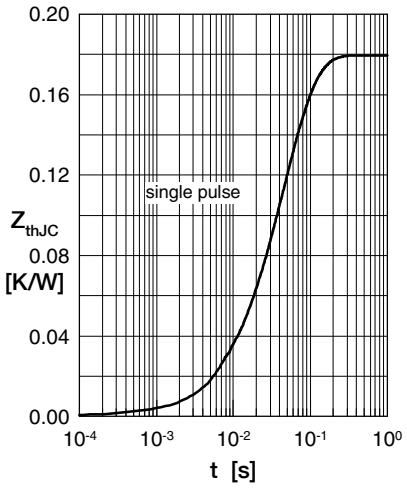


Fig. 12 Typical transient thermal impedance

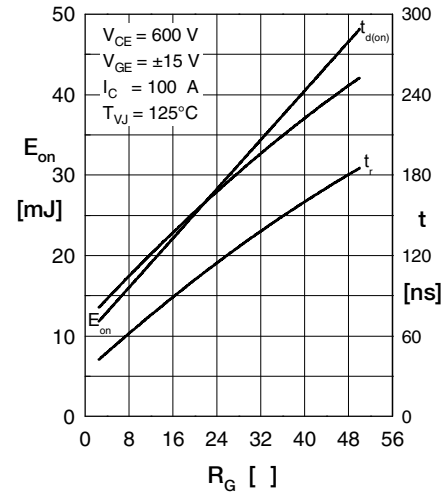


Fig. 9 Typ. turn on energy & switching times versus gate resistor

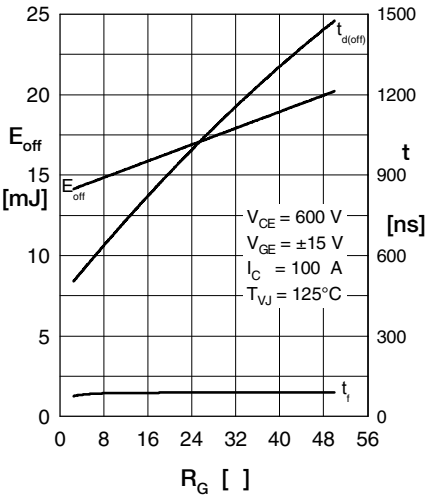


Fig. 9 Typ. turn off energy & switching times versus gate resistor

Buck Diode BD

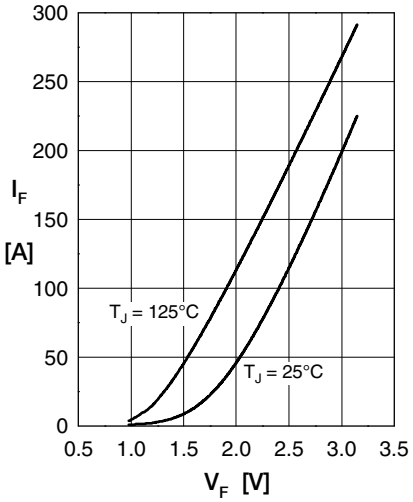


Fig. 1 Typ. Forward current vs. V_F

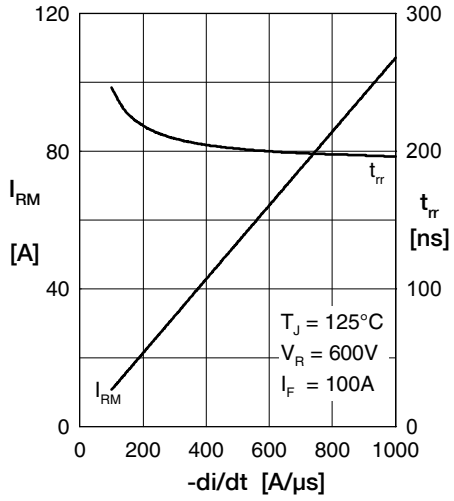


Fig. 2 Typ. peak reverse current I_{RM} versus di/dt

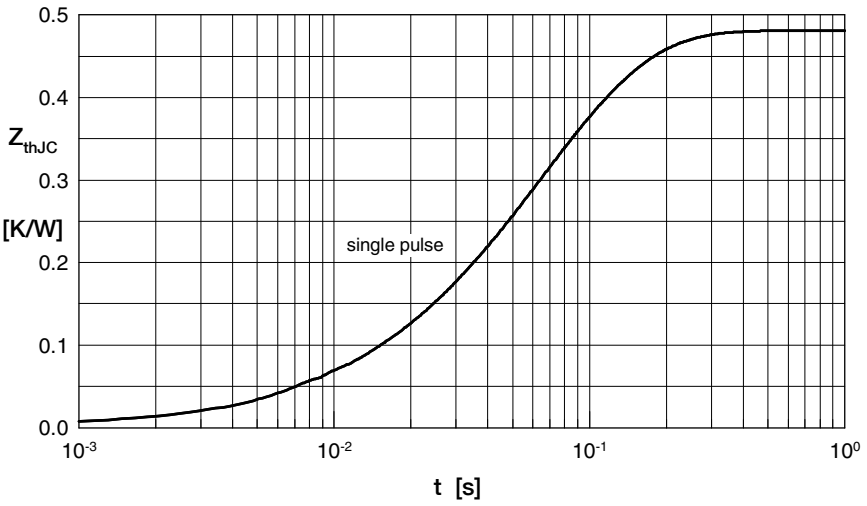


Fig. 3 Typ. transient thermal impedance junction to case