



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!



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IGBT Module

Sixpack

Short Circuit SOA Capability
Square RBSOA

$$I_{C25} = 19 \text{ A}$$

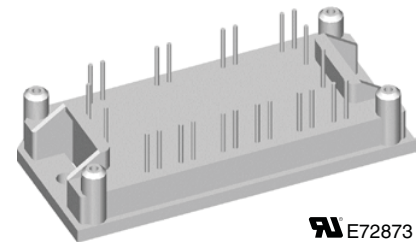
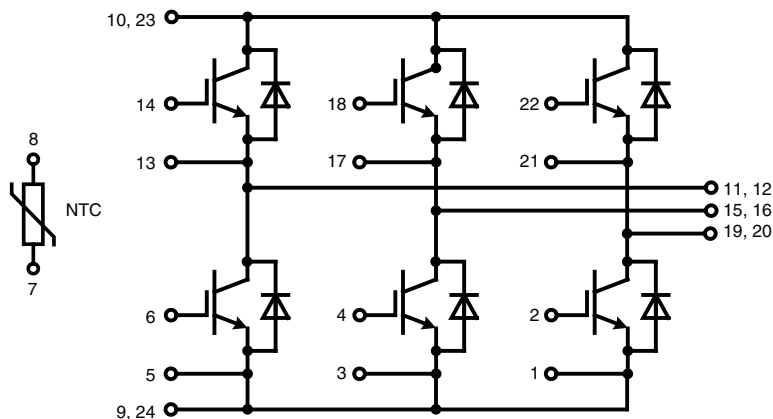
$$V_{CES} = 1200 \text{ V}$$

$$V_{CE(sat) \text{ typ.}} = 3.0 \text{ V}$$

Preliminary data

Part name (Marking on product)

MWI15-12A6K



Pin configuration see outlines.

Features:

- NPT IGBTs
 - low saturation voltage
 - positive temperature coefficient for easy paralleling
 - fast switching
 - short tail current for optimized performance also in resonant circuits
- HiPerFRED™ diode:
 - fast reverse recovery
 - low operating forward voltage
 - low leakage current
- Industry Standard Package
 - solderable pins for PCB mounting
 - isolated copper base plate

Application:

- AC drives
- UPS
- Welding

Package:

- UL registered
- Industry standard E1-pack

IGBTs

Symbol	Definitions	Conditions	Ratings			Unit	
			min.	typ.	max.		
V_{CES}	collector emitter voltage		$T_{VJ} = 25^{\circ}\text{C}$ to 150°C			V	
V_{GES}	max. DC gate voltage	continuous			± 20	V	
V_{GEM}	max. transient collector gate voltage	transient			± 30	V	
I_{C25}	collector current		$T_C = 25^{\circ}\text{C}$			A	
I_{C80}			$T_C = 80^{\circ}\text{C}$			A	
P_{tot}	total power dissipation		$T_C = 25^{\circ}\text{C}$			W	
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 15\text{ A}; V_{GE} = 15\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			V	
			$T_{VJ} = 125^{\circ}\text{C}$			V	
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 0.35\text{ mA}; V_{GE} = V_{CE}$	$T_{VJ} = 25^{\circ}\text{C}$	4.5	6.5	V	
I_{CES}	collector emitter leakage current	$V_{CE} = V_{CES}; V_{GE} = 0\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			mA	
			$T_{VJ} = 125^{\circ}\text{C}$			mA	
I_{GES}	gate emitter leakage current	$V_{CE} = 0\text{ V}; V_{GE} = \pm 20\text{ V}$			100	nA	
C_{ies}	input capacitance	$V_{CE} = 25\text{ V}; V_{GE} = 0\text{ V}; f = 1\text{ MHz}$		600		pF	
$Q_{G(on)}$	total gate charge	$V_{CE} = 600\text{ V}; V_{GE} = 15\text{ V}; I_C = 10\text{ A}$		45		nC	
$t_{d(on)}$	turn-on delay time	} inductive load $V_{CE} = 600\text{ V}; I_C = 10\text{ A}$ $V_{GE} = \pm 15\text{ V}; R_G = 82\ \Omega$	$T_{VJ} = 125^{\circ}\text{C}$			50	ns
t_r	current rise time					40	ns
$t_{d(off)}$	turn-off delay time					290	ns
t_f	current fall time					60	ns
E_{on}	turn-on energy per pulse					1.2	mJ
E_{off}	turn-off energy per pulse					1.1	mJ
I_{CM}	reverse bias safe operating area	RBSOA; $V_{GE} = \pm 15\text{ V}; R_G = 82\ \Omega$ $L = 100\ \mu\text{H};$ clamped induct. load $V_{CEmax} = V_{CES} - L_S \cdot di/dt$	$T_{VJ} = 125^{\circ}\text{C}$			30	A
t_{SC} (SCSOA)	short circuit safe operating area	$V_{CE} = 1200\text{ V}; V_{GE} = \pm 15\text{ V};$ $R_G = 82\ \Omega;$ non-repetitive	$T_{VJ} = 125^{\circ}\text{C}$			10	μs
R_{thJC}	thermal resistance junction to case	(per IGBT)			1.37	K/W	
R_{thCH}	thermal resistance case to heatsink	(per IGBT)		0.5		K/W	

Diodes

Symbol	Definitions	Conditions	Ratings			Unit	
			min.	typ.	max.		
V_{RRM}	max. repetitive reverse voltage		$T_{VJ} = 150^{\circ}\text{C}$			V	
I_{F25}	forward current		$T_C = 25^{\circ}\text{C}$			A	
I_{F80}			$T_C = 80^{\circ}\text{C}$			A	
V_F	forward voltage	$I_F = 15\text{ A}; V_{GE} = 0\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			2.4	V
			$T_{VJ} = 125^{\circ}\text{C}$			1.7	V
I_{RM}	max. reverse recovery current	} $V_R = 600\text{ V}$ $di_F/dt = -400\text{ A}/\mu\text{s}$ $I_F = 15\text{ A}; V_{GE} = 0\text{ V}$	$T_{VJ} = 125^{\circ}\text{C}$			16	A
t_{rr}	reverse recovery time					130	ns
$E_{rec(off)}$	reverse recovery energy					tbd	μJ
R_{thJC}	thermal resistance junction to case	(per diode)			1.6	K/W	
R_{thCH}	thermal resistance case to heatsink	(per diode)		0.55		K/W	

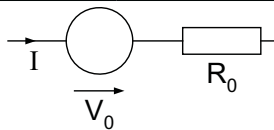
 $T_C = 25^{\circ}\text{C}$ unless otherwise stated

Temperature Sensor NTC

Symbol	Definitions	Conditions	Ratings			Unit
			min.	typ.	max.	
R_{25}	<i>resistance</i>	$T_c = 25^\circ\text{C}$	4.45	4.7	5.0	k Ω
$B_{25/85}$				3510		K

Module

Symbol	Definitions	Conditions	Ratings			Unit
			min.	typ.	max.	
T_{VJ}	<i>operating temperature</i>		-40		125	$^\circ\text{C}$
T_{VJM}	<i>max. virtual junction temperature</i>				150	$^\circ\text{C}$
T_{stg}	<i>storage temperature</i>		-40		125	$^\circ\text{C}$
V_{ISOL}	<i>isolation voltage</i>	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$			2500	V~
M_d	<i>mounting torque</i>	(M4)	2.0		2.2	Nm
d_s	<i>creep distance on surface</i>		12.7			mm
d_A	<i>strike distance through air</i>		12.7			mm
Weight				40		g

Equivalent Circuits for Simulation

Ratings

Symbol	Definitions	Conditions	min.	typ.	max.	Unit
V_0	<i>IGBT</i>	$T_{VJ} = 125^\circ\text{C}$		tbd		V
R_0				tbd		m Ω
V_0	<i>free wheeling diode</i>	$T_{VJ} = 125^\circ\text{C}$		1.38		V
R_0				40		m Ω

