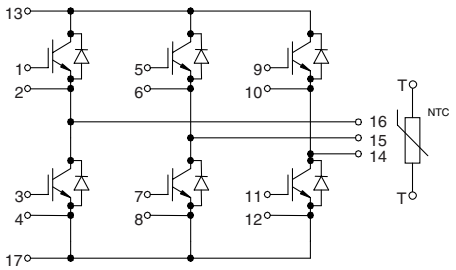
IGBT Modules
Sixpack

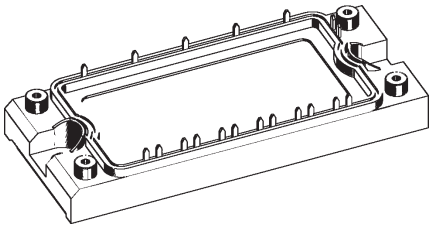
Short Circuit SOA Capability
Square RBSOA

I_{C25} = 50 A
V_{CES} = 1200 V
$V_{CE(sat)\ typ.}$ = 2.2 V

Preliminary Data

Type:	NTC - Option:
MWI 25-12 A7	without NTC
MWI 25-12 A7T	with NTC





IGBTs

Symbol	Conditions	Maximum Ratings	
V_{CES}	T_{VJ} = 25°C to 150°C	1200	V
V_{GES}		± 20	V
I_{C25}	T_C = 25°C	50	A
I_{C80}	T_C = 80°C	35	A
RBSOA	V_{GE} = ±15 V; R_G = 47 Ω; T_{VJ} = 125°C Clamped inductive load; L = 100 µH	I_{CM} = 70 $V_{CEK} \leq V_{CES}$	A
t_{SC} (SCSOA)	$V_{CE} = V_{CES}$; V_{GE} = ±15 V; R_G = 47 Ω; T_{VJ} = 125°C non-repetitive	10	µs
P_{tot}	T_C = 25°C	225	W

Symbol	Conditions	Characteristic Values (T_{VJ} = 25°C, unless otherwise specified) min.	typ.	max.	
$V_{CE(sat)}$	I_C = 25 A; V_{GE} = 15 V; T_{VJ} = 25°C		2.2	2.7	V
	T_{VJ} = 125°C		2.6		V
$V_{GE(th)}$	I_C = 1 mA; $V_{GE} = V_{CE}$	4.5		6.5	V
I_{CES}	$V_{CE} = V_{CES}$; V_{GE} = 0 V; T_{VJ} = 25°C			2	mA
	T_{VJ} = 125°C		2		mA
I_{GES}	V_{CE} = 0 V; V_{GE} = ± 20 V			200	nA
$t_{d(on)}$	Inductive load, T_{VJ} = 125°C V_{CE} = 600 V; I_C = 25 A V_{GE} = ±15 V; R_G = 47 Ω		100		ns
t_r			70		ns
$t_{d(off)}$			500		ns
t_f			70		ns
E_{on}			3.8		mJ
E_{off}			2.8		mJ
C_{ies}	V_{CE} = 25 V; V_{GE} = 0 V; f = 1 MHz		1650		pF
Q_{Gon}	V_{CE} = 600V; V_{GE} = 15 V; I_C = 35 A		120		nC
R_{thJC}	(per IGBT)			0.55	K/W

Features
- 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
- solderable pins for PCB mounting
- package with copper base plate

Advantages
- space savings
- reduced protection circuits
- package designed for wave soldering

Typical Applications
- AC motor control
- AC servo and robot drives
- power supplies

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Diodes

Symbol	Conditions	Maximum Ratings	
I_{F25}	T_C = 25°C	50	A
I_{F80}	T_C = 80°C	33	A

Symbol	Conditions	Characteristic Values min.	typ.	max.	
V_F	I_F = 25 A; V_{GE} = 0 V; T_{VJ} = 25°C		2.3	2.7	V
	T_{VJ} = 125°C		1.7		V
I_{RM}	I_F = 25 A; di_F/dt = -400 A/µs; T_{VJ} = 125°C		20		A
t_{rr}	V_R = 600 V; V_{GE} = 0 V		200		ns
R_{thJC}	(per diode)			1.19	K/W

Temperature Sensor NTC (MWI ... A7T version only)

Symbol	Conditions	Characteristic Values min.	typ.	max.	
R_{25}	T = 25°C	4.75	5.0	5.25	kΩ
$B_{25/50}$			3375		K

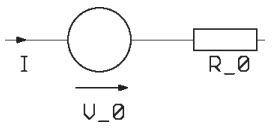
Module

Symbol	Conditions	Maximum Ratings	
T_{VJ}		-40...+150	°C
T_{stg}		-40...+125	°C
V_{ISOL}	$I_{ISOL} \leq$ 1 mA; 50/60 Hz	2500	V~
M_d	Mounting torque (M5)	2.7 - 3.3	Nm

Symbol	Conditions	Characteristic Values min.	typ.	max.	
$R_{pin-chip}$			5		mΩ
d_S	Creepage distance on surface	6			mm
d_A	Strike distance in air	6			mm
R_{thCH}	with heatsink compound		0.02		K/W
Weight			180		g

Equivalent Circuits for Simulation

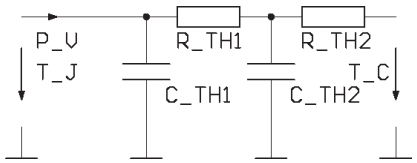
Conduction



IGBT (typ. at V_{GE} = 15 V; T_J = 125°C)
V_0 = 1.5 V; R_0 = 40.7 mΩ

Free Wheeling Diode (typ. at T_J = 125°C)
V_0 = 1.3 V; R_0 = 16.0 mΩ

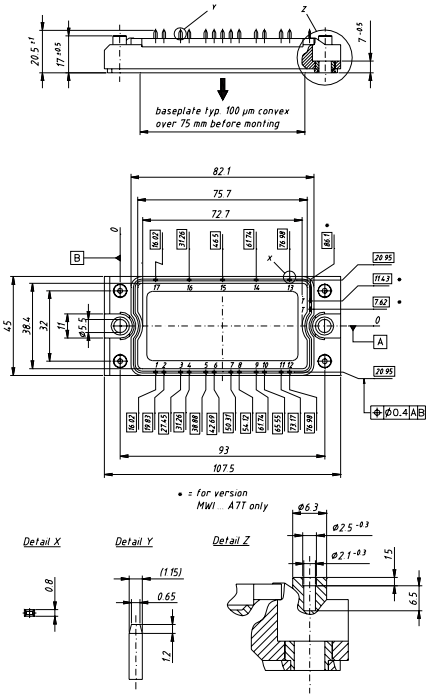
Thermal Response



IGBT (typ.)
C_{th1} = 0.136 J/K; R_{th1} = 0.418 K/W
C_{th2} = 1.309 J/K; R_{th2} = 0.132 K/W

Free Wheeling Diode (typ.)
C_{th1} = 0.081 J/K; R_{th1} = 0.973 K/W
C_{th2} = 0.915 J/K; R_{th2} = 0.217 K/W

Dimensions in mm (1 mm = 0.0394")



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