

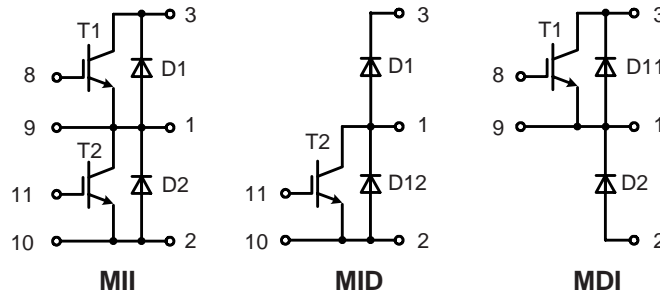
# IGBT Module

phaseleg and chopper topologies

**MII 400-12E4**  
**MID 400-12E4**  
**MDI 400-12E4**

**$I_{C25}$  = 420 A**  
 **$V_{CES}$  = 1200 V**  
 **$V_{CE(sat)}$  typ. = 2.2 V**

Preliminary



## IGBTs T1-T2

Symbol	Conditions	Maximum Ratings	
$V_{CES}$	$T_{VJ} = 25^{\circ}\text{C}$ to $150^{\circ}\text{C}$	1200	V
$V_{GES}$		$\pm 20$	V
$I_{C25}$	$T_C = 25^{\circ}\text{C}$	420	A
$I_{C80}$	$T_C = 80^{\circ}\text{C}$	300	A
$I_{CM}$	$V_{GE} = \pm 15\text{ V}$ ; $R_G = 4.7\ \Omega$ ; $T_{VJ} = 125^{\circ}\text{C}$	450	A
$V_{CEK}$	<b>RBSOA</b> , Clamped inductive load; $L = 100\ \mu\text{H}$	$V_{CES}$	
$t_{SC}$ (SCSOA)	$V_{CE} = 900\text{ V}$ ; $V_{GE} = \pm 15\text{ V}$ ; $R_G = 4.7\ \Omega$ ; $T_{VJ} = 125^{\circ}\text{C}$ non repetitive	10	$\mu\text{s}$
$P_{tot}$	$T_C = 25^{\circ}\text{C}$	1700	W

## Features

- IGBT
  - low saturation voltage
  - positive temperature coefficient
  - fast switching
  - short tail current for optimized performance in resonant circuits
- HiPerFRED™ diodes
  - fast and soft reverse recovery
  - low operating forward voltage
  - low leakage current
- Package
  - low inductive current path
  - screw connection to high current main terminals
  - use of non interchangeable connectors for auxiliary terminals possible
  - kelvin emitter terminal for easy drive
  - isolated ceramic base plate

Symbol	Conditions	Characteristic Values ( $T_{VJ} = 25^{\circ}\text{C}$ , unless otherwise specified)			
		min.	typ.	max.	
$V_{CE(sat)}$	$I_C = 300\text{ A}$ ; $V_{GE} = 15\text{ V}$ ; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		2.2 2.6	V V	
$V_{GE(th)}$	$I_C = 10\text{ mA}$ ; $V_{GE} = V_{CE}$	4.5		6.5 V	
$I_{CES}$	$V_{CE} = V_{CES}$ ; $V_{GE} = 0\text{ V}$ ; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		0.8 3.5	mA mA	
$I_{GES}$	$V_{CE} = 0\text{ V}$ ; $V_{GE} = \pm 20\text{ V}$			600 nA	
$t_{d(on)}$ $t_r$ $t_{d(off)}$ $t_f$	Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 600\text{ V}$ ; $I_C = 300\text{ A}$ $V_{GE} = \pm 15\text{ V}$ ; $R_G = 4.7\ \Omega$		150 60 680 50	ns ns ns ns	
$E_{on}$			36	mJ	
$E_{off}$			30	mJ	
$C_{ies}$		$V_{CE} = 25\text{ V}$ ; $V_{GE} = 0\text{ V}$ ; $f = 1\text{ MHz}$		17	nF
$Q_{Gon}$		$V_{CE} = 600\text{ V}$ ; $V_{GE} = 15\text{ V}$ ; $I_C = 300\text{ A}$		2.25	$\mu\text{C}$
$R_{thJC}$ $R_{thJH}$	(per IGBT) with heatsink compound		0.15	0.08 K/W K/W	

## Applications

- drives
  - AC
  - DC
- power supplies
  - rectifiers with power factor correction and recuperation capability
  - UPS

