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[MIO1500-25E10](#)

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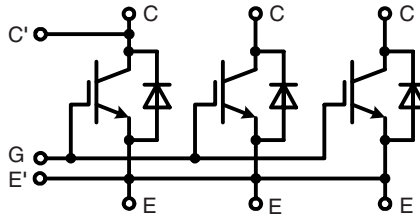
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IXYS Advanced Technical Information **MIO 1500-25E10**

**IGBT Module
Single switch**

Short Circuit SOA Capability
Square RBSOA

$I_{C80} = 1500 \text{ A}$
 $V_{CES} = 2500 \text{ V}$
 $V_{CE(sat) \text{ typ.}} = 2.7 \text{ V}$



IGBT		
Symbol	Conditions	Maximum Ratings
V_{CES}	$V_{GE} = 0 \text{ V}$	2500 V
V_{GES}		$\pm 20 \text{ V}$
I_{C80}	$T_C = 80^\circ\text{C}$	1500 A
I_{CM}	$t_p = 1 \text{ ms}; T_C = 80^\circ\text{C}$	3000 A
t_{SC}	$V_{CC} = 1700 \text{ V}; V_{CEM \text{ CHIP}} \leq 2500 \text{ V}; V_{GE} \leq 15 \text{ V}; T_{VJ} \leq 125^\circ\text{C}$	10 μs

Features

- NPT³ IGBT
- Low-loss
- Smooth switching waveforms for good EMC
- Industry standard package
- High power density
- AISiC base-plate for high power cycling capacity
- AlN substrate for low thermal resistance

Typical Applications

- AC power converters for
 - industrial drives
 - windmills
 - traction
- LASER pulse generator

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$V_{CE(sat)} \text{ ①}$	$I_C = 1500 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		2.7 3.3	V V
$V_{GE(th)}$	$I_C = 240 \text{ mA}; V_{CE} = V_{GE}$	6		7.5 V
I_{CES}	$V_{CE} = 2500 \text{ V}; V_{GE} = 0 \text{ V}; T_{VJ} = 125^\circ\text{C}$			100 mA
I_{GES}	$V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}; T_{VJ} = 125^\circ\text{C}$			500 nA
E_{on}	Inductive load; $T_{VJ} = 125^\circ\text{C}; V_{GE} = \pm 15 \text{ V}; V_{CC} = 1200\text{V}; I_C = 1500\text{A}; R_G = 1.5\Omega; L_\sigma = 100\text{nH}$		1400	mJ
E_{off}			1450	mJ
R_{thJC}				0.008 K/W

① Collector emitter saturation voltage is given at chip level

Diode

Symbol	Conditions	Maximum Ratings	
I_{F80}	$T_C = 80^\circ\text{C}$	1500	A
I_{FSM}	$V_R = 0\text{ V}; T_{VJ} = 125^\circ\text{C}; t_p = 10\text{ ms};$ half-sinewave	13000	A

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V_F ②	$I_F = 1500\text{ A}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	2.30		V
		2.35		V
I_{RM} t_{rr} Q_{RR} E_{rec}	$V_{CC} = 1200\text{ V}; I_C = 1500\text{ A};$ $V_{GE} = \pm 15\text{ V}; R_G = 1.5\ \Omega; T_{VJ} = 125^\circ\text{C}$ Inductive load; $L_\sigma = 100\text{ nH}$	1100		A
		1500		ns
		925		μC
		800		mJ
R_{thJC}			0.016	K/W

② Forward voltage is given at chip level

Module

Symbol	Conditions	Maximum Ratings	
T_{JM}	max junction temperature	+150	$^\circ\text{C}$
T_{VJ}	Operating temperature	-40...+125	$^\circ\text{C}$
T_{stg}	Storage temperature	-40...+125	$^\circ\text{C}$
V_{ISOL}	50 Hz	5000	V~
M_d	Mounting torque	Base-heatsink, M6 screws	4 - 6 Nm
		Main terminals, M8 screws	8 - 10 Nm

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
d_A	Clearance distance	terminal to base	23	mm
		terminal to terminal	19	mm
d_S	Surface creepage distance	terminal to base	33	mm
		terminal to terminal	33	mm
L_σ	Module stray inductance, C to E terminal	10	nH	
$R_{term-chip}^*$	Resistance terminal to chip	0.12	m Ω	
R_{thCH}	per module; λ grease = 1 W/m \cdot K	0.006	K/W	
Weight		1500	g	

$$^*) V = V_{CE(sat)} + R_{term-chip} \cdot I_C \text{ resp. } V = V_F + R_{term-chip} \cdot I_F$$

