





Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

**CM15MD1-24H**

**CI Module**

**Three Phase Converter + Three Phase Inverter**

15 Amperes/1200 Volts

**Absolute Maximum Ratings,  $T_j = 25^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	CM15MD1-24H	Units
Power Device Junction Temperature	$T_j$	-40 to 150	$^\circ\text{C}$
Storage Temperature	$T_{\text{stg}}$	-40 to 125	$^\circ\text{C}$
Mounting Torque, M4 Mounting Screws	—	13	in-lb
Module Weight (Typical)	—	100	Grams
Isolation Voltage, AC 1 minute, 60Hz	$V_{\text{RMS}}$	2500	Volts

**Converter Sector**

Repetitive Peak Reverse Voltage	$V_{\text{RRM}}$	1600	Volts
Recommended AC Input Voltage	$E_a$	440	Volts
DC Output Current	$I_o$	15	Amperes
Surge (Non-repetitive) Forward Current	$I_{\text{FSM}}$	150	Amperes
$I^2t$ for Fusing	$I^2t$	93	$\text{A}^2\text{s}$

**IGBT Inverter Sector**

Collector-Emitter Voltage (G-E Short)	$V_{\text{CES}}$	1200	Volts
Gate-Emitter Voltage (C-E Short)	$V_{\text{GES}}$	$\pm 20$	Volts
Collector Current	$I_c$	15	Amperes
Collector Current (Pulse)*	$I_{\text{CM}}$	30	Amperes
Emitter Current**	$I_e$	15	Amperes
Emitter Current** (Pulse)*	$I_{\text{EM}}$	30	Amperes
Maximum Collector Dissipation	$P_c$	66	Watts

**Electrical and Mechanical Characteristics,  $T_j = 25^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
<b>Converter Sector</b>						
Repetitive Reverse Current	$I_{\text{RRM}}$	$V_R = V_{\text{RRM}}, T_j = 150^\circ\text{C}$	—	—	8	mA
Forward Voltage Drop	$V_{\text{FM}}$	$I_F = 15\text{A}$	—	—	1.5	Volts
Thermal Resistance (Junction-to-Fin)	$R_{\text{th(j-f)}}$	Per Diode	—	—	1.7	$^\circ\text{C}/\text{W}$

**IGBT Inverter Sector**

Collector Cutoff Current	$I_{\text{CES}}$	$V_{\text{CE}} = V_{\text{CES}}, V_{\text{GE}} = 0\text{V}$	—	—	1	mA	
Gate-Emitter Threshold Voltage	$V_{\text{GE(th)}}$	$V_{\text{CE}} = 10\text{V}, I_c = 1.5\text{mA}$	4.5	6.0	7.5	Volts	
Gate-Emitter Cutoff Current	$I_{\text{GES}}$	$V_{\text{GE}} = V_{\text{GES}}, V_{\text{CE}} = 0\text{V}$	—	—	0.5	$\mu\text{A}$	
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$V_{\text{GE}} = 15\text{V}, I_c = 15\text{A}, T_j = 25^\circ\text{C}$	—	2.7	3.4	Volts	
		$V_{\text{GE}} = 15\text{V}, I_c = 15\text{A}, T_j = 150^\circ\text{C}$	—	2.45	—	Volts	
Input Capacitance	$C_{\text{ies}}$		—	—	3.0	nF	
Output Capacitance	$C_{\text{oes}}$	$V_{\text{GE}} = 0\text{V}, V_{\text{CE}} = 10\text{V}$	—	—	2.4	nF	
Reverse Transfer Capacitance	$C_{\text{res}}$		—	—	0.6	nF	
Total Gate Charge	$Q_g$	$V_{\text{CC}} = 600\text{V}, I_c = 15\text{A}, V_{\text{GE}} = 15\text{V}$	—	75	—	nC	
Resistive Load	Turn-on Time	$t_{\text{d(on)}}$	$V_{\text{GE1}} = V_{\text{GE2}} = 15\text{V},$		—	100	nS
	Rise Time	$t_r$	$V_{\text{CC}} = 600\text{V}, I_c = 15\text{A},$		—	200	nS
Switching Times	Turn-off Time	$t_{\text{d(off)}}$	$R_g = 21\Omega,$		—	150	nS
	Fall Time	$t_f$	Resistive Load		—	350	nS
Emitter-Collector Voltage	$V_{\text{EC}}$	$I_e = 15\text{A}, V_{\text{GE}} = 0\text{V}$	—	—	3.5	Volts	
Reverse Recovery Time	$t_{\text{rr}}$	$I_e = 15\text{A}, V_{\text{GE}} = 0\text{V},$	—	—	250	nS	
Reverse Recovery Charge	$Q_{\text{rr}}$	$di_e/dt = -30\text{A}/\mu\text{s}$	—	0.11	—	$\mu\text{C}$	
Thermal Resistance (Junction-to-Fin)	$R_{\text{th(j-f)}}$	Per IGBT	—	—	1.9	$^\circ\text{C}/\text{W}$	
		Per FWDi	—	—	2.4	$^\circ\text{C}/\text{W}$	



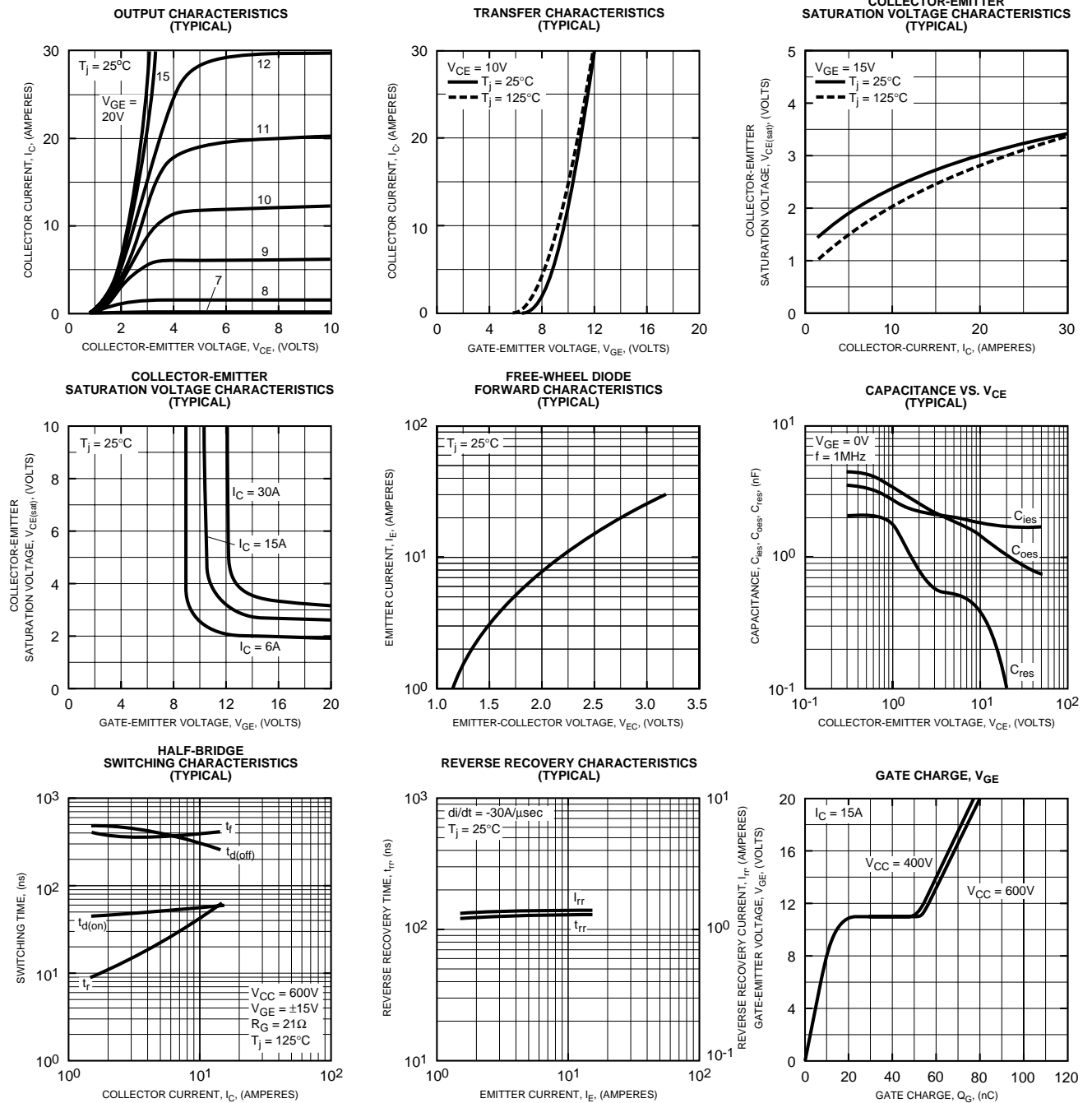
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