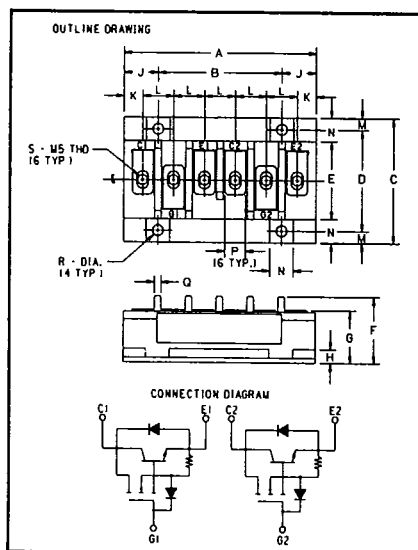


POWEREX**JT234510**
JT235010

T-39-31

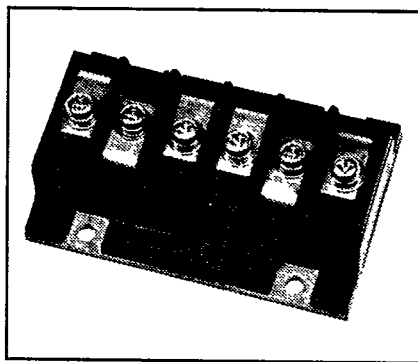
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272
 Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Split-Dual Cascade
MOSBIP™
Power Modules
100 Amperes/450-500 Volts



450-500 Volts JT234510, JT235010
Outline Drawing

Dimension	Inches	Millimeters
A	3.858 ± 0.016	98 ± 0.4
B	2.48 ± 0.012	63 ± 0.3
C	2.52 ± 0.016	64 ± 0.4
D	2.047 ± 0.012	52 ± 0.3
E	1.575 ± 0.012	40 ± 0.3
F	1.339 Max.	34 Max.
G	1.063 + 0.02/-0.00	27 + 0.5/-0.0
H	.276	7
J	.689	17.5
K	.374	9.5
L	.622	15.8
M	.236	6
N	.472	12
P	.413 ± .008	10.5 ± 0.2
Q	.134	3.4
R	216 ± .006 Dia	5.5 ± 0.15 Dia.
S	M5 Metric	M5



JT234510
JT235010
Split-Dual Cascade
MOSBIP™
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 100 Amperes/450-500 Volts

Description

Powerex Split-Dual Cascade MOSBIP™ Power Modules are designed for use in applications requiring high frequency switching and low loss control. The modules have MOSFET input with bipolar current handling capability. The module consists of two Cascade MOSBIP™s with each having its own reverse parallel connected high-speed diode.

Features:

- ☐ Isolated Mounting
- ☐ Hybrid Construction
- ☐ Speed Up Diodes
- ☐ Low Thermal Impedance
- ☐ Low Drive Requirement
- ☐ Low Losses

Applications:

- ☐ AC Motor Control
- ☐ UPS Inverters
- ☐ 20 kHz Battery Supply
- ☐ PWM Regulators

Ordering Information

Example: Select the complete eight digit module part number you desire from the table - i.e. JT235010 is a 500 Volt, 100 Ampere Dual Cascade MOSBIP™ Module.

Type	V _{ces} Volts (×10)	Current Rating Amperes (×10)
JT23	45	10
JT23	50	10



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JT234510

JT235010

Split-Dual Cascade MOSBIP™ Power Modules

100 Amperes/450-500 Volts

Maximum Ratings $T_J = 25^\circ\text{C}$ unless otherwise specified

	Symbol	JT234510/JT235010	Units
Junction Temperature	T_J	- 55 to 150	$^\circ\text{C}$
Storage Temperature	T_{STG}	- 40 to 125	$^\circ\text{C}$
Collector-Emitter Voltage	V_{CES}	450/500	Volts
Gate-Emitter Voltage	V_{GES}	20, - 12	Volts
Continuous Collector Current	I_C	100	Amperes
Continuous Diode Forward Current	I_{FM}	100	Amperes
Pulsed Collector Current Repetitive	I_{CM}	200	Amperes
Power Dissipation	P_T	620	Watts
Max. Mounting Torque Terminal Screws (M5)	—	17	in.-lb.
Max. Mounting Torque Mounting Screws (M5)	—	17	in.-lb.
Module Weight	—	420	Grams
V isolation	V_{RMS}	2500	Volts

Static Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	JT234510/JT235010			Units
			Min.	Typ.	Max.	
Zero Gate Voltage Collector Current	I_{CES}	$V_{\text{CE}} = V_{\text{CES}}, V_{\text{GE}} = 0\text{V}$	—	—	1	mA
Zero Gate Voltage Collector Current	I_{CES}	$V_{\text{CE}} = 0.8 V_{\text{CES}}, V_{\text{GE}} = 0\text{V}$ $T_J = 125^\circ\text{C}$	—	—	4	mA
Gate Emitter Threshold	$V_{\text{GE(th)}}$	$I_C = 1 \text{ mA}, V_{\text{CE}} = 10\text{V}$	2	3	5	Volts
Gate Emitter Leakage	I_{GES}	$\pm V_{\text{GE}} = \pm V_{\text{GES}}$ $V_{\text{CE}} = 0\text{V}$	—	—	.5	μA
Collector Emitter Saturation Voltage	$V_{\text{CE(SAT)}}$	$V_{\text{GE}} = 10\text{V}, I_C = 100\text{A}$	—	—	3.5	Volts
		$V_{\text{GE}} = 10\text{V}, I_C = 100\text{A}, T_J = 125^\circ\text{C}$	—	—	7.5	Volts
Thermal Resistance, Case to Sink Lubricated	$R_{\theta\text{CS}}$	—	—	—	—	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta\text{JC}}$	Transistor Part	—	—	0.2	$^\circ\text{C/W}$



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JT234510

JT235010

Split-Dual Cascade MOSBIP™ Power Modules

100 Amperes/450-500 Volts

Free Wheel Diode Characteristics $T_J = 25^\circ\text{C}$ unless otherwise specified

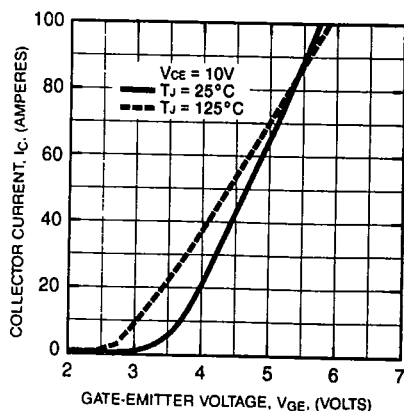
Characteristics	Symbol	Test Conditions	Min.	JT234510/JT235010 Typ.	Max.	Units
Diode Forward Voltage	V_{FM}	$I_{FM} = 100\text{A}$, $V_{GE} = 0\text{V}$	—	—	1.7	Volts
Reverse Recovery Time	t_{rr}	$I_{FM} = 100\text{A}$ $di_F/dt = 100\text{A}/\mu\text{s}$	—	—	400	ns
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Diode Part	—	—	1.1	$^\circ\text{C}/\text{W}$

Dynamic Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise specified

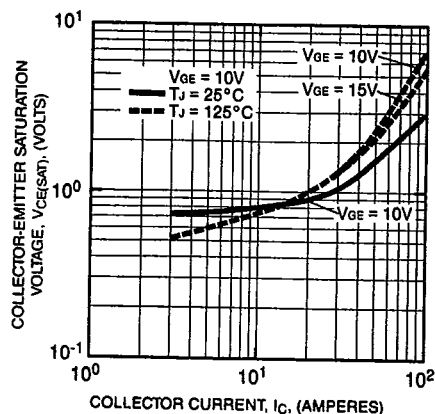
Characteristics	Symbol	Test Conditions	Min.	JT234510/JT235010 Typ.	Max.	Units
Forward Transconductance	g_{fs}	$I_C = 100\text{A}$, $V_{CE} = 10\text{V}$ $t_w \leq 300\mu\text{s}$, Duty = 2%	15	—	—	mhos
Input Capacitance	C_{ies}	$V_{GE} = 0\text{V}$, $V_{CE} = 10\text{V}$, $f = 1\text{MHz}$	—	—	6600	pf
Output Capacitance	C_{oes}	$V_{GE} = 0\text{V}$, $V_{CE} = 10\text{V}$, $f = 1\text{MHz}$	—	—	3000	pf
Reverse Transfer Capacitance	C_{res}	$V_{GE} = 0\text{V}$, $V_{CE} = 10\text{V}$, $f = 1\text{MHz}$	—	—	350	pf
Total Gate Charge	Q_G	$V_{DD} = 0.8 V_{CES}$ $V_{GS} = 10\text{V}$, $I_C = 100\text{A}$	—	800	—	nC
Turn On Time*	t_{on}	$V_{CC} = 0.5 V_{CES}$	—	—	2	μs
Storage Time	t_s	$I_C = 100\text{A}$, $V_{GE} = 10\text{V}$	—	—	4	μs
Fall Time	t_f	$R_{GEN} = R_{GS} = 50\Omega$	—	—	2	μs

* Turn on Time (t_{on}) = Turn on Delay ($t_{d(on)}$) + Rise Time (t_r)

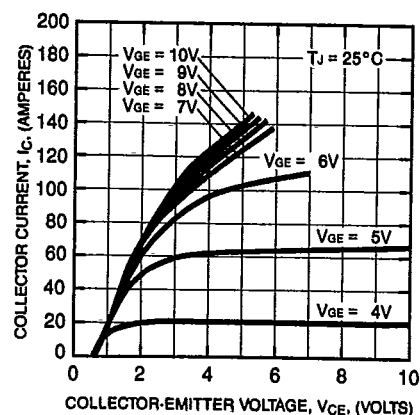
TRANSFER CHARACTERISTIC
(TYPICAL)



SATURATION VOLTAGE
(TYPICAL)



COMMON EMITTER OUTPUT CHARACTERISTICS
(TYPICAL)





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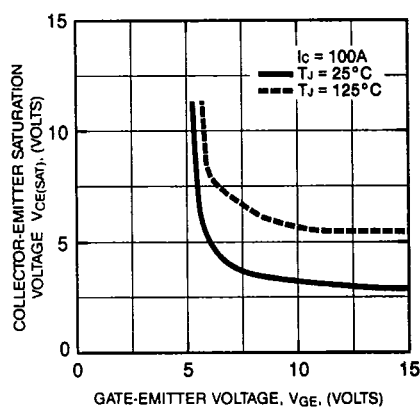
JT234510

JT235010

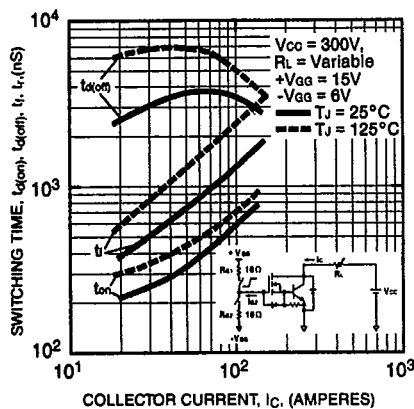
Split-Dual Cascade MOSBIP™ Power Modules

100 Amperes/450-500 Volts

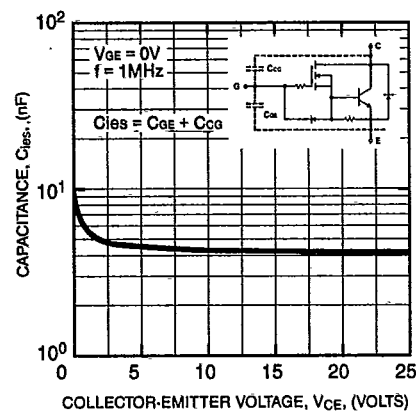
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



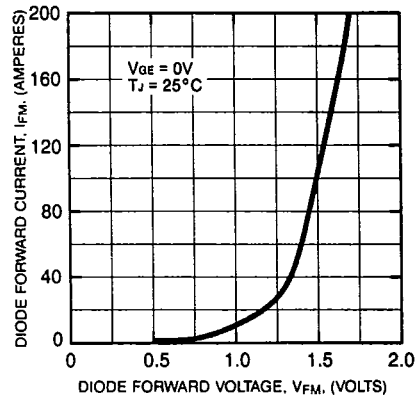
SWITCHING CHARACTERISTICS (TYPICAL)



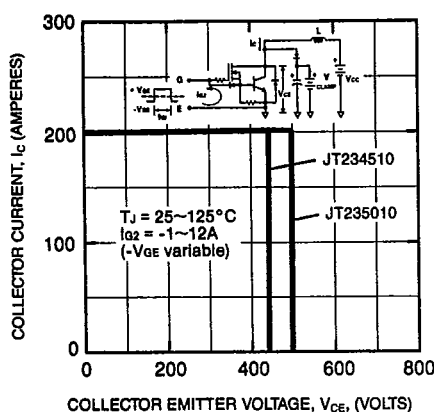
CAPACITANCE VS. COLLECTOR-EMITTER VOLTAGE (TYPICAL)



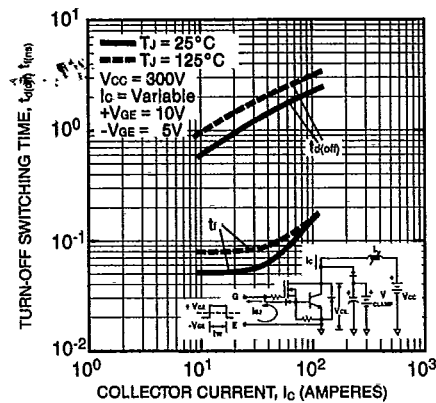
DIODE CHARACTERISTICS (TYPICAL)



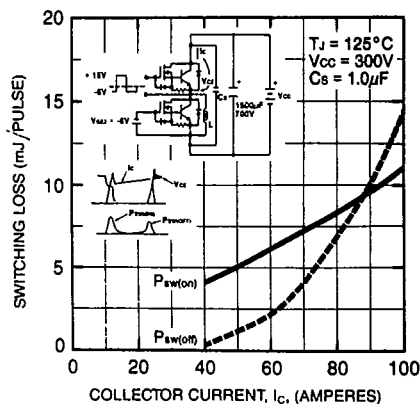
CLAMPED INDUCTIVE LOAD SWITCHING SAFE OPERATING AREA (S.S.O.A.)



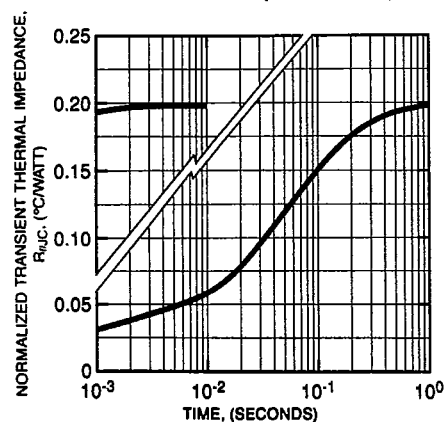
CLAMPED INDUCTIVE LOAD TURN-OFF CHARACTERISTICS



SWITCHING LOSS CHARACTERISTICS (TYPICAL FOR HALF BRIDGE OPERATION)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

