POWEREX

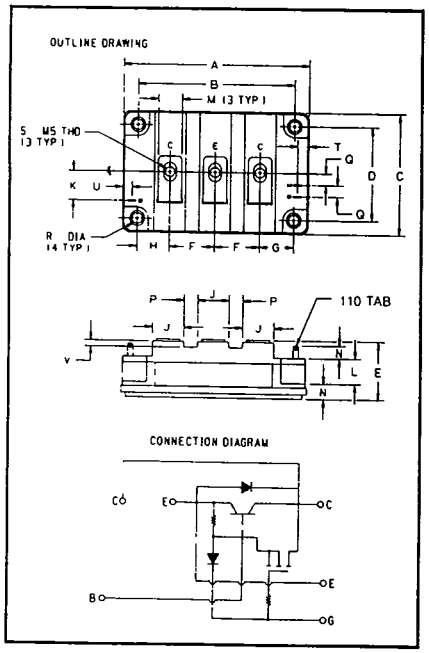
JS334520
JS335020

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

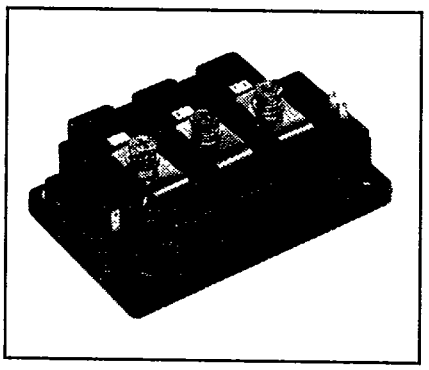
Single Cascade MOSBIP™ Power Modules

200 Amperes/450-500 Volts



450-500 Volts JS334520, JS335020
Outline Drawing

Dimension	Inches	Millimeters
A	3 701	94
B	3 150 ± 01	80 ± 0.25
C	2 441	62
D	1 890 ± 01	48 ± 0.25
E	1 181 Max.	30 Max.
F	906	23
G	689	17 5
H	650	16.5
J	630	16
K	596	15
L	512	13
M	472	12
N	315	8
P	276	7
Q	236	6
R	216 Dia.	5.5 Dia
S	M5 Metric	M5
T	197	5
U	157	4
V	118	3



JS334520
JS335020
Single Cascade
MOSBIP™
Power Modules
200 Amperes/450-500 Volts

Description
Powerex Single 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 one Cascade MOSBIP™ with its own reverse parallel connected high-speed diode.

Features:
- ☐ Isolated Mounting
- ☐ Hybrid Construction
- ☐ Speed Up Diode
- ☐ 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. JS335020 is a 500 Volt, 200 Ampere Single Cascade MOSBIP™ Module.

Type	V_{CES} Volts (×10)	Current Rating Amperes (×10)
JS33	45	20
JS33	50	20

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Maximum Ratings T_J=25°C unless otherwise specified

	Symbol	JS334520/JS335020	Units
Junction Temperature	T_J	−40 to 150	°C
Storage Temperature	T_{STG}	−40 to 125	°C
Collector Emitter Voltage	V_{CES}	450/500	Volts
Gate-Emitter Voltage	V_{GES}	20, −12	Volts
Continuous Collector Current	I_C	200	Amperes
Continuous Diode Forward Emitter Current	I_{FM}	200	Amperes
Pulsed Collector Current Repetitive	I_{CM}	400	Amperes
Power Dissipation	P_T	1240	Watts
Max. Mounting Torque Terminal Screws (M5)	—	17	in.-lb.
Max Mounting Torque Mounting Screws (M5)	—	17	in.-lb.
Module Weight	—	460	Grams
V isolation	V_{RMS}	2500	Volts

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Static Electrical Characteristics T_J=25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	JS334520/JS335020 Min.	Typ.	Max.	Units
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=V_{CES}$, $V_{GE}=0V$	—	—	2	mA
Gate Emitter Threshold	$V_{GE(th)}$	$I_C=1$ mA, $V_{CE}=10V$	2	3	5	Volts
Gate Emitter Leakage	I_{GES}	$\pm V_{GE}=\pm V_{GES}$, $V_{CE}=0V$	—	—	0.2	μA
Collector Emitter Saturation Voltage	$V_{CE(SAT)}$	$V_{GE}=10V$, $I_C=200A$	—	—	3.5	Volts
		$V_{GE}=10V$, $I_C=200A$, $T_J=125°C$	—	—	7.5	Volts
Thermal Resistance, Case to Sink Lubricated	$R_{\theta CS}$	—	—	—	—	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Transistor Part	—	—	0.1	°C/W

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Free Wheel Diode Characteristics T_J = 25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	JS334520/JS335020 Min.	Typ.	Max.	Units
Diode Forward Voltage	V_{FM}	I_{FM} = 200A, V_{GE} = 0V	—	—	1.7	Volts
Reverse Recovery Time	t_{rr}	I_{FM} = 200A, dI_F/dt = 400A/μs	—	—	400	ns
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Diode Part	—	—	—	°C/W

Dynamic Electrical Characteristics T_J = 25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	JS334520/JS335020 Min.	Typ.	Max.	Units
Forward Transconductance	g_{fs}	I_C = 200A, V_{CE} = 10V, $t_w \leq 300\mu s$, Duty = 2%	15	—	—	mhos
Input Capacitance	C_{ies}	V_{GE} = 0V, V_{CE} = 10V, f = 1 Mhz	—	—	12000	pf
Output Capacitance	C_{oes}		—	—	3000	pf
Reverse Transfer Capacitance	C_{res}		—	—	1000	pf
Total Gate Charge	Q_G	V_{DD} = 0.8 V_{CES}, V_{GS} = 10V, I_C = 200A	—	—	—	nC
Turn On Time*	t_{on}	V_{CC} = 0.5 V_{CES}, I_{G2} = −4A	—	—	2	μs
Storage Time	t_s	I_C = 200A, V_{GE} = 10V	—	—	4	μs
Fall Time	t_f	R_{GEN} = R_{GS} = 50Ω	—	—	2	μs

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

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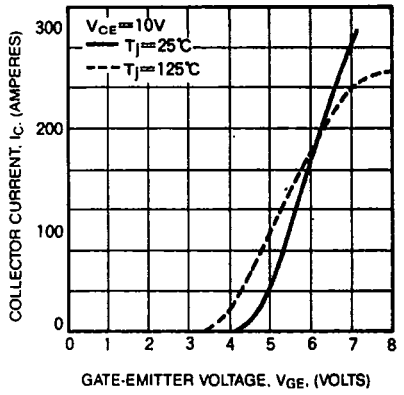
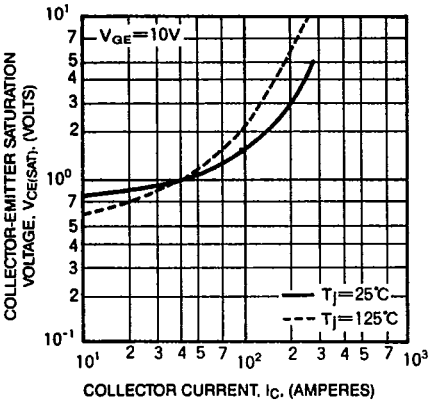
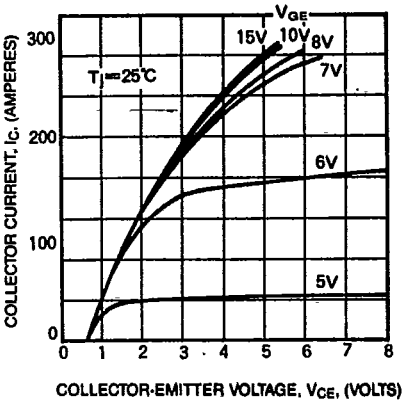
TRANSFER CHARACTERISTIC (TYPICAL)



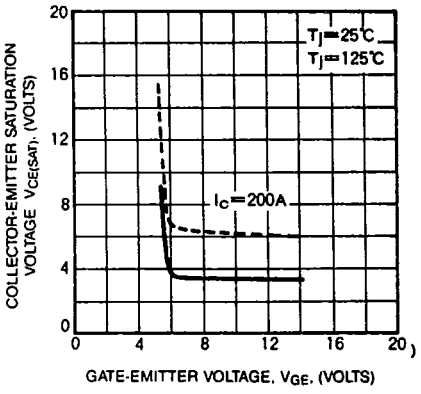
SATURATION VOLTAGE (TYPICAL)



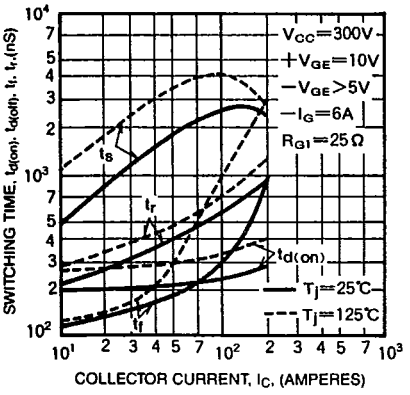
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



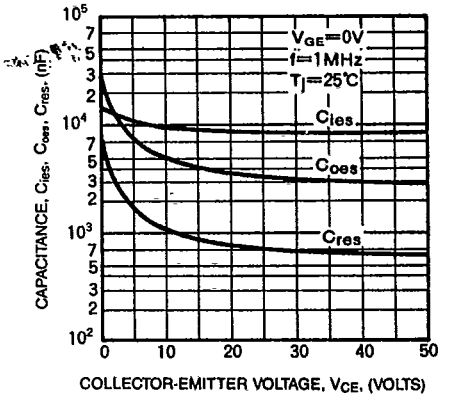
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



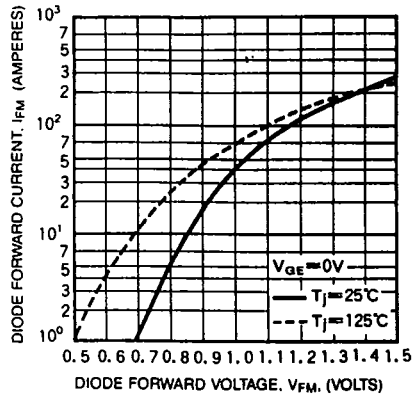
SWITCHING CHARACTERISTICS (TYPICAL)



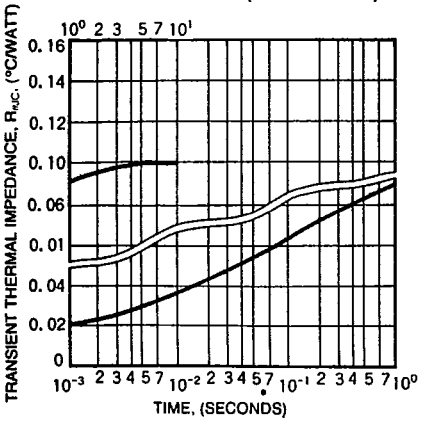
CAPACITANCE VS. COLLECTOR-EMITTER VOLTAGE (TYPICAL)



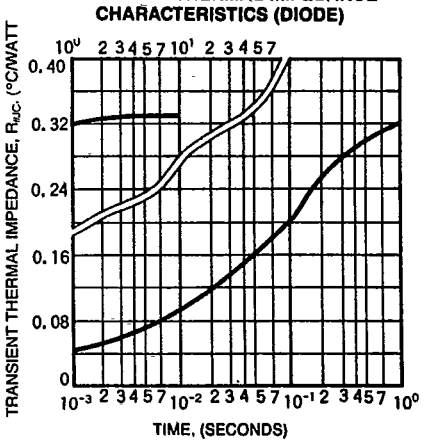
DIODE CHARACTERISTICS (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)



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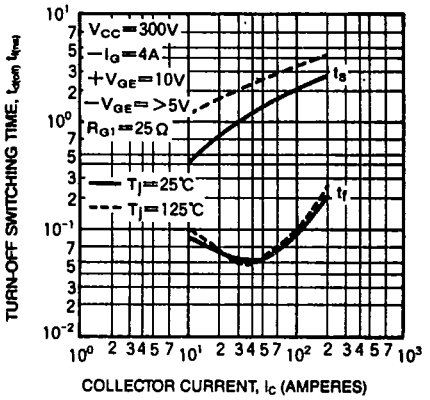
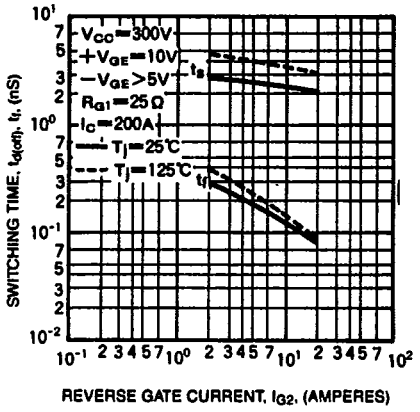
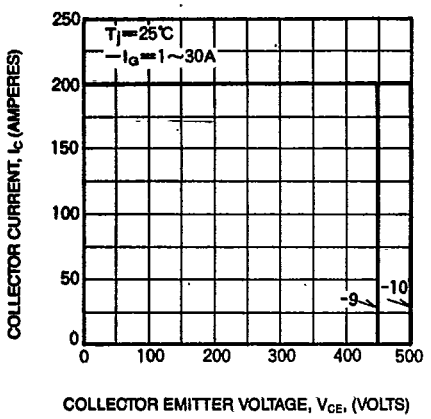
CLAMPED INDUCTIVE LOAD TURN-OFF CHARACTERISTICS



SWITCHING CHARACTERISTICS VS. REVERSE GATE CURRENT (TYPICAL)



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



SOURCE-DRAIN DIODE REVERSE RECOVERY CHARACTERISTICS (TYPICAL)