MITSUBISHI TRANSISTOR MODULES

QM15TB-2HB

MEDIUM POWER SWITCHING USE
INSULATED TYPE

QM15TB-2HB

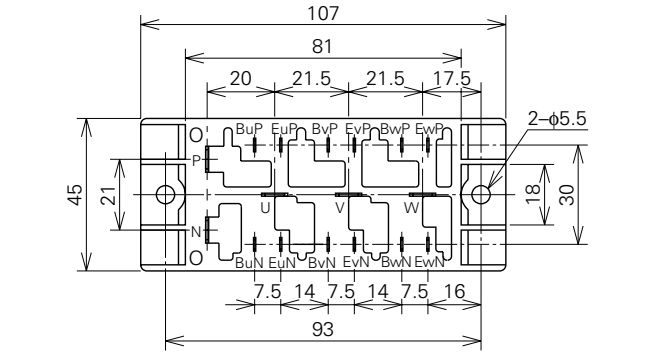
- **I_C** Collector current **15A**
- **V_{CEX}** Collector-emitter voltage **1000V**
- **h_{FE}** DC current gain **250**
- **Insulated Type**
- **UL Recognized**
  Yellow Card No. E80276 (N)
  File No. E80271

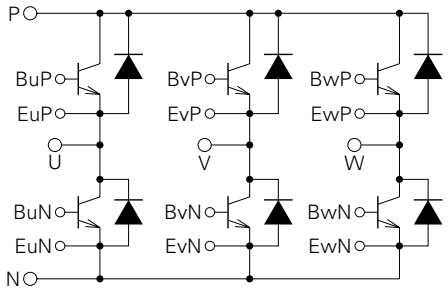
APPLICATION

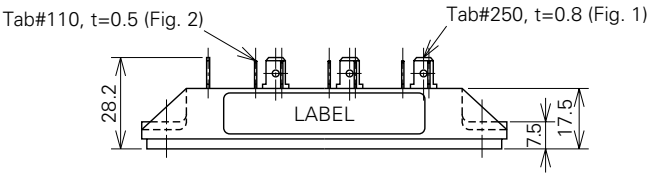
Inverters, Servo drives, DC motor controllers, NC equipment, Welders

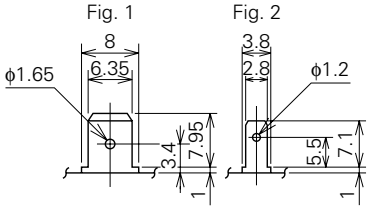
OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm









Note: All Transistor Units are 3-Stage Darlingtons.

MITSUBISHI ELECTRIC

QM15TB-2HB

MEDIUM POWER SWITCHING USE
INSULATED TYPE

ABSOLUTE MAXIMUM RATINGS (Tj=25°C, unless otherwise noted)

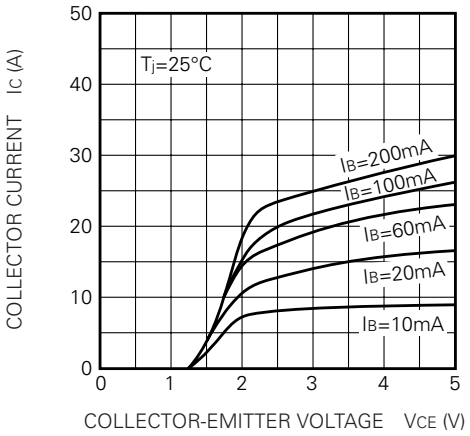
Symbol	Parameter	Conditions	Ratings	Unit
$V_{CEX\ (SUS)}$	Collector-emitter voltage	I_C=1A, V_{EB}=2V	1000	V
V_{CEX}	Collector-emitter voltage	V_{EB}=2V	1000	V
V_{CBO}	Collector-base voltage	Emitter open	1000	V
V_{EBO}	Emitter-base voltage	Collector open	7	V
I_C	Collector current	DC	15	A
$-I_C$	Collector reverse current	DC (forward diode current)	15	A
P_C	Collector dissipation	T_C=25°C	150	W
I_B	Base current	DC	1	A
$-I_{CSM}$	Surge collector reverse current (forward diode current)	Peak value of one cycle of 60Hz (half wave)	150	A
T_j	Junction temperature		–40~+150	°C
T_{stg}	Storage temperature		–40~+125	°C
V_{iso}	Isolation voltage	Charged part to case, AC for 1 minute	2500	V
—	Mounting torque	Mounting screw M5	1.47~1.96	N·m
			15~20	kg·cm
—	Weight	Typical value	230	g

ELECTRICAL CHARACTERISTICS (Tj=25°C, unless otherwise noted)

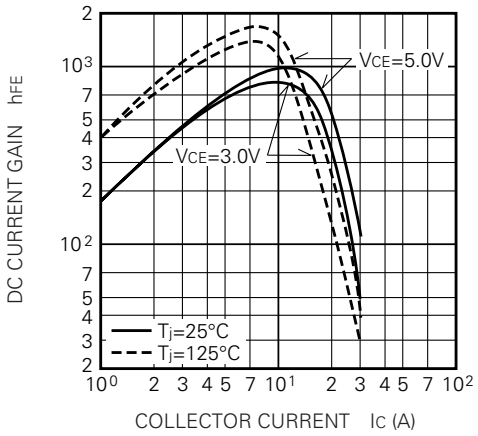
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I_{CEX}	Collector cutoff current	V_{CE}=1000V, V_{EB}=2V	—	—	1.0	mA
I_{CBO}	Collector cutoff current	V_{CB}=1000V, Emitter open	—	—	1.0	mA
I_{EBO}	Emitter cutoff current	V_{EB}=7V	—	—	50	mA
$V_{CE\ (sat)}$	Collector-emitter saturation voltage	I_C=15A, I_B=60mA	—	—	3.0	V
$V_{BE\ (sat)}$	Base-emitter saturation voltage		—	—	3.5	V
$-V_{CEO}$	Collector-emitter reverse voltage	$-I_C$=15A (diode forward voltage)	—	—	1.8	V
h_{FE}	DC current gain	I_C=15A, V_{CE}=3.0V	250	—	—	—
t_{on}	Switching time	V_{CC}=600V, I_C=15A, I_{B1}=90mA, I_{B2}=–0.3A	—	—	2.0	µs
t_s			—	—	10	µs
t_f			—	—	3.0	µs
$R_{th\ (j-c)\ Q}$	Thermal resistance (junction to case)	Transistor part (per 1/6 module)	—	—	0.8	°C/W
$R_{th\ (j-c)\ R}$		Diode part (per 1/6 module)	—	—	2.0	°C/W
$R_{th\ (c-f)}$	Contact thermal resistance (case to fin)	Conductive grease applied (per 1/6 module)	—	—	0.35	°C/W

PERFORMANCE CURVES

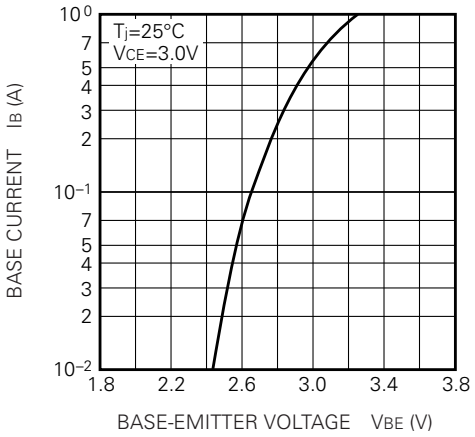
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



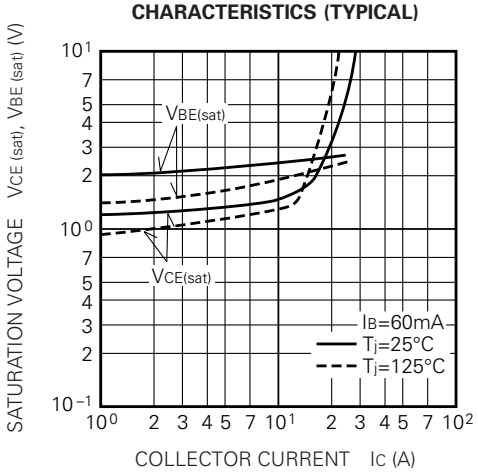
DC CURRENT GAIN VS. COLLECTOR CURRENT (TYPICAL)



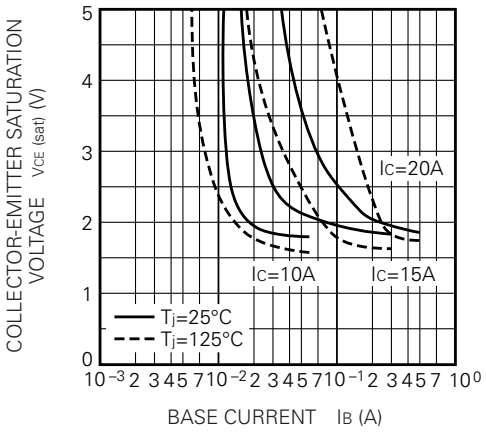
COMMON EMITTER INPUT CHARACTERISTIC (TYPICAL)



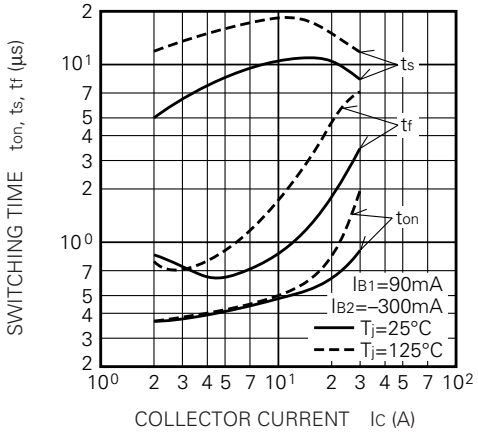
SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)

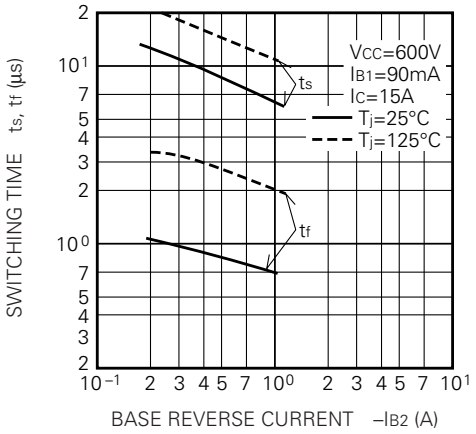


SWITCHING TIME VS. COLLECTOR CURRENT (TYPICAL)

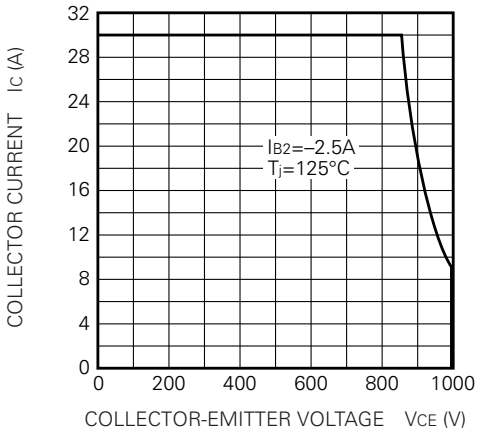


MITSUBISHI ELECTRIC

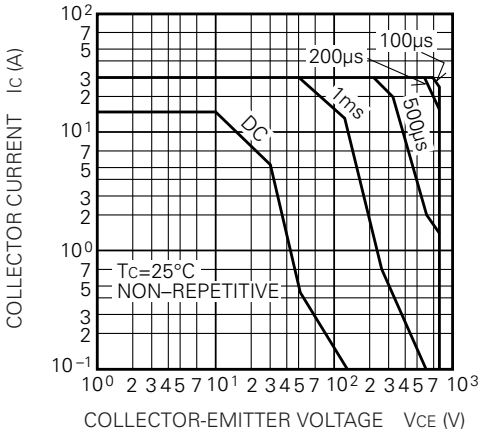
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



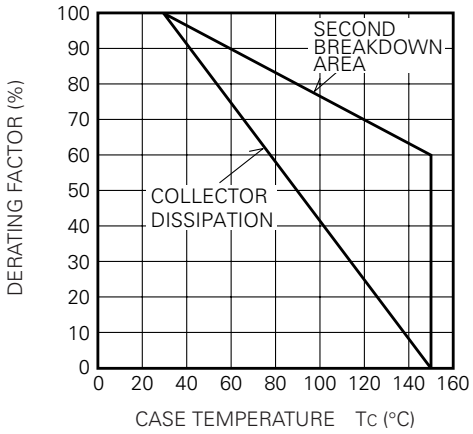
REVERSE BIAS SAFE OPERATING AREA



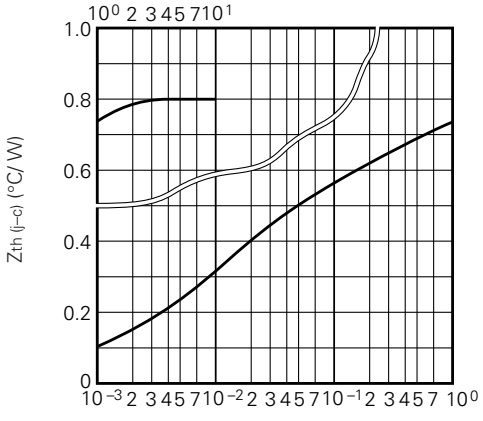
FORWARD BIAS SAFE OPERATING AREA



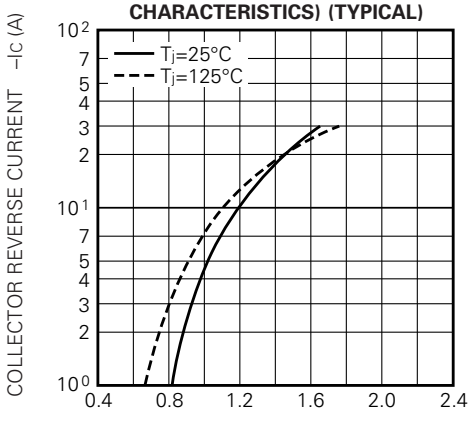
DERATING FACTOR OF F. B. S. O. A.



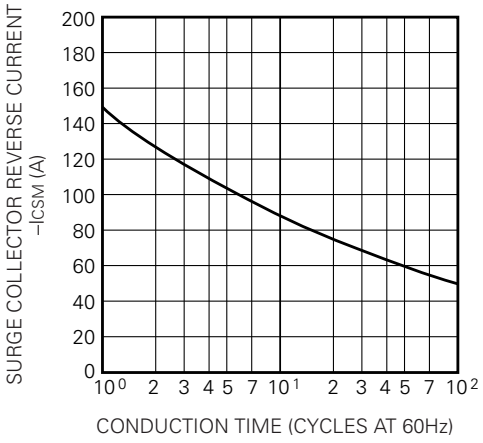
TRANSIENT THERMAL IMPEDANCE CHARACTERISTIC (TRANSISTOR)



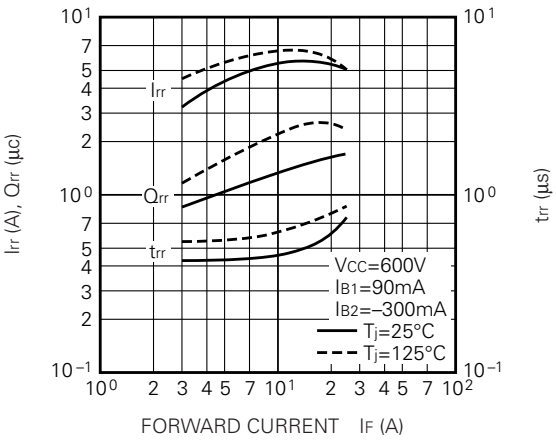
REVERSE COLLECTOR CURRENT VS. COLLECTOR-EMITTER REVERSE VOLTAGE (DIODE FORWARD CHARACTERISTICS) (TYPICAL)



RATED SURGE COLLECTOR REVERSE CURRENT (DIODE FORWARD SURGE CURRENT)



REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTIC (DIODE)