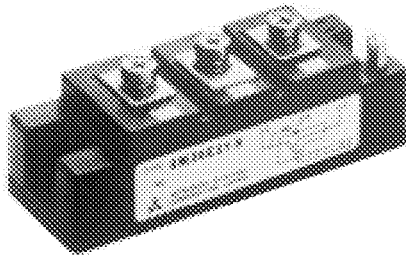


MITSUBISHI TRANSISTOR MODULES

QM30E2Y/E3Y-H

MEDIUM POWER SWITCHING USE
INSULATED TYPE

QM30E2Y/E3Y-H



- I_C Collector current **30A**
- V_{CEX} Collector-emitter voltage **600V**
- h_{FE} DC current gain..... **75**
- **Insulated Type**
- **UL Recognized**

Yellow Card No. E80276 (N)

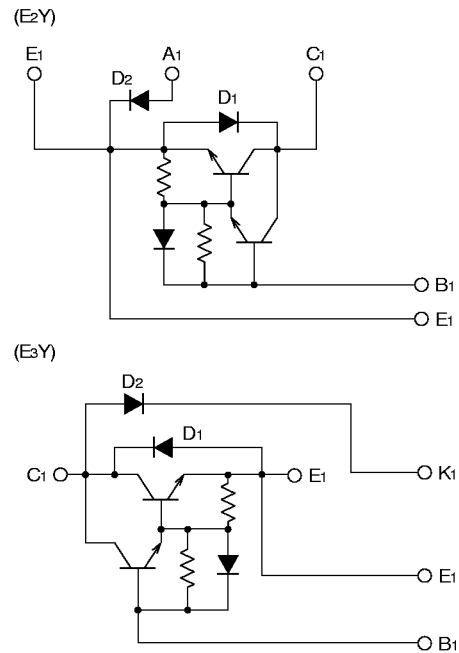
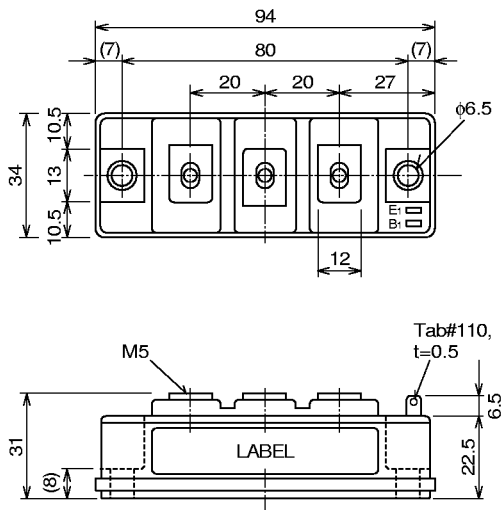
File No. E80271

APPLICATION

DC chopper, DC motor controllers, Inverters

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



QM30E2Y/E3Y-H

MEDIUM POWER SWITCHING USE
INSULATED TYPE

ABSOLUTE MAXIMUM RATINGS (Transistor part including D1, T_j=25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V _{CEX(SUS)}	Collector-emitter voltage	I _C =1A, V _{EB} =2V	600	V
V _{CEX}	Collector-emitter voltage	V _{EB} =2V	600	V
V _{CB0}	Collector-base voltage	Emitter open	600	V
V _{EB0}	Emitter-base voltage	Collector open	7	V
I _C	Collector current	DC	30	A
-I _C	Collector reverse current	DC (forward diode current)	30	A
P _C	Collector dissipation	T _C =25°C	250	W
I _B	Base current	DC	1.8	A
-I _{CSM}	Surge collector reverse current (forward diode current)	Peak value of one cycle of 60Hz (half wave)	300	A

ABSOLUTE MAXIMUM RATINGS (Diode part (D2), T_j=25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V _{RRM}	Repetitive peak reverse voltage		600	V
V _{RSM}	Non-repetitive peak reverse voltage		720	V
V _{R(DC)}	DC reverse voltage		480	V
I _{DC}	DC current	DC circuit, resistive, inductive load	30	A
I _{FSM}	Surge (non-repetitive) forward current	Peak value of one cycle of 60Hz (half wave)	600	A
I _T ²	I _T ² for fusing	Value for one cycle of surge current	1.5 × 10 ³	A ² s

ABSOLUTE MAXIMUM RATINGS (Common)

Symbol	Parameter	Conditions	Ratings	Unit
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	Main terminal screw M5	1.47~1.96	N·m
			15~20	kg·cm
		Mounting screw M6	1.96~2.94	N·m
			20~30	kg·cm
—	Weight	Typical value	210	g

ELECTRICAL CHARACTERISTICS (Transistor part including D1, T_j=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I _{CX}	Collector cutoff current	V _{CE} =600V, V _{EB} =2V	—	—	1.0	mA
I _{CB0}	Collector cutoff current	V _{CB} =600V, Emitter open	—	—	1.0	mA
I _{EB0}	Emitter cutoff current	V _{EB} =7V	—	—	200	mA
V _{CE(sat)}	Collector-emitter saturation voltage	I _C =30A, I _B =0.4A	—	—	2.0	V
V _{BE(sat)}	Base-emitter saturation voltage		—	—	2.5	V
-V _{CEO}	Collector-emitter reverse voltage	-I _C =30A (diode forward voltage)	—	—	1.85	V
h _{FE}	DC current gain	I _C =30A, V _{CE} =2V/5V	75/100	—	—	—
t _{on}	Switching time	V _{CC} =300V, I _C =30A, I _{B1} =-I _{B2} =0.6A	—	—	1.5	μs
t _s			—	—	12	μs
t _f			—	—	3.0	μs
R _{th(j-c) Q}	Thermal resistance (junction to case)	Transistor part	—	—	0.5	°C/W
R _{th(j-c) R}		Diode part	—	—	2.0	°C/W
R _{th(c-f)}	Contact thermal resistance (case to fin)	Conductive grease applied	—	—	0.15	°C/W

QM30E2Y/E3Y-H

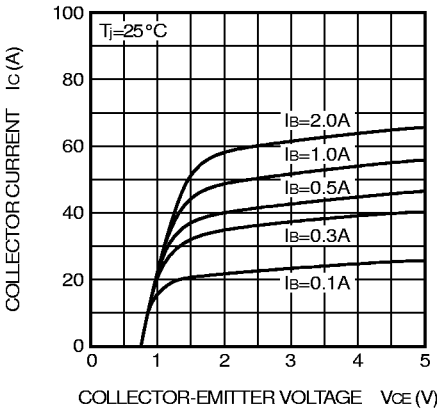
MEDIUM POWER SWITCHING USE
INSULATED TYPE

ELECTRICAL CHARACTERISTICS (Diode part (D2), $T_j=25^\circ\text{C}$)

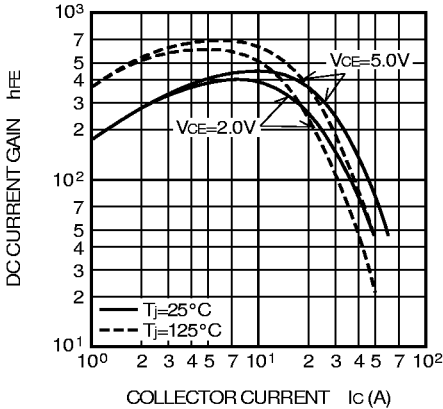
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I_{RRM}	Repetitive peak reverse current	$V_R=V_{RRM}$, $T_j=150^\circ\text{C}$	—	—	5.0	mA
V_{FM}	Forward voltage	$I_F=30\text{A}$	—	—	1.5	V
t_{rr}	Reverse recovery time	$I_F=30\text{A}$, $di/dt=-60\text{A}/\mu\text{s}$, $V_R=600\text{V}$, $T_j=150^\circ\text{C}$	—	—	0.9	μs
Q_{rr}	Reverse recovery charge		—	—	15	μC
$R_{th(j-c)}$	Thermal resistance	Junction to case	—	—	1.3	$^\circ\text{C}/\text{W}$
$R_{th(c-f)}$	Contact thermal resistance	Conductive grease applied (case to fin)	—	—	0.15	$^\circ\text{C}/\text{W}$

PERFORMANCE CURVES

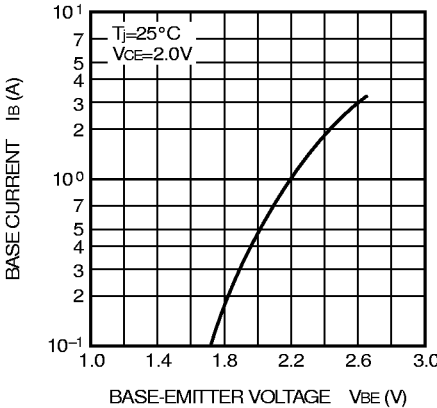
COMMON EMITTER OUTPUT
CHARACTERISTICS (TYPICAL)



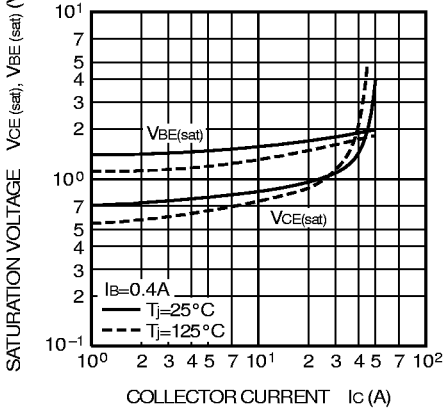
DC CURRENT GAIN VS.
COLLECTOR CURRENT (TYPICAL)



COMMON EMITTER INPUT
CHARACTERISTIC (TYPICAL)

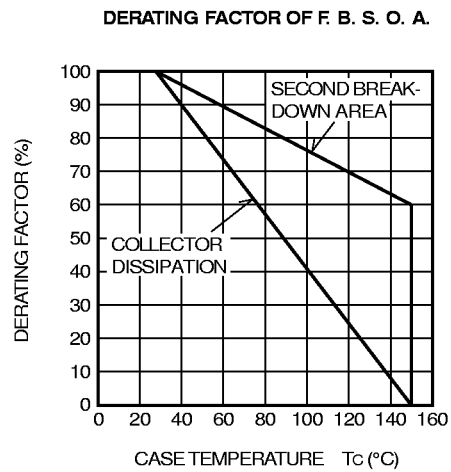
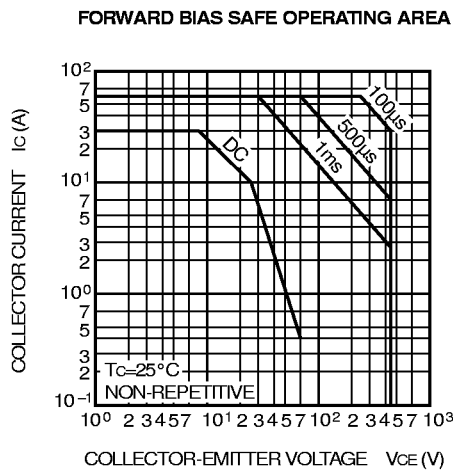
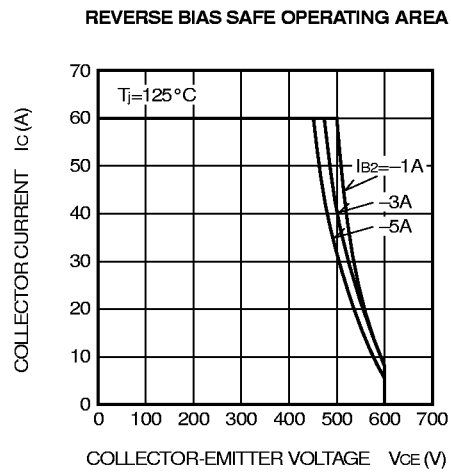
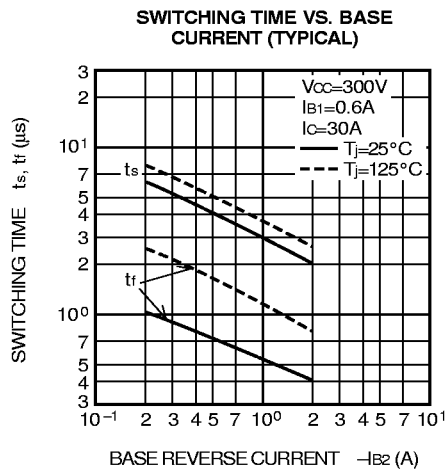
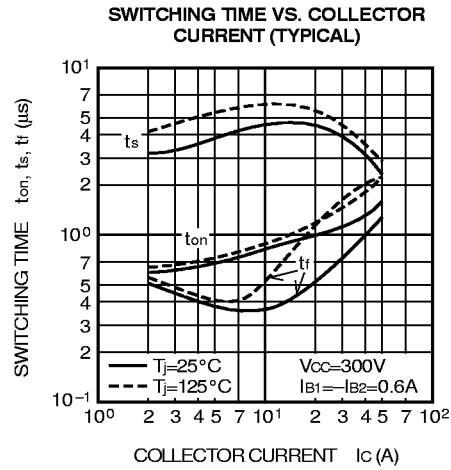
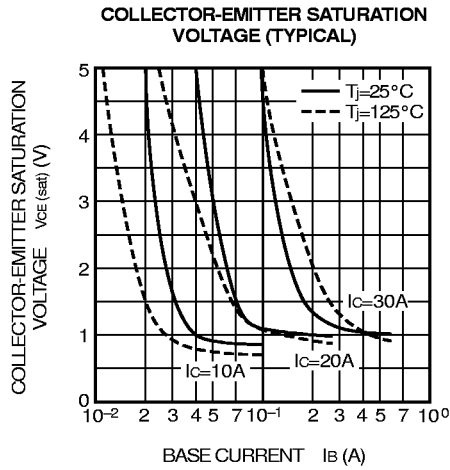


SATURATION VOLTAGE
CHARACTERISTICS (TYPICAL)



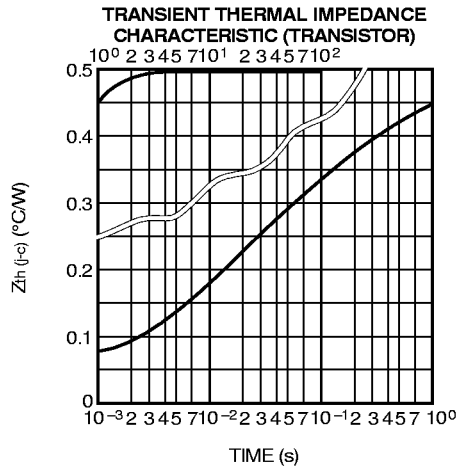
QM30E2Y/E3Y-H

MEDIUM POWER SWITCHING USE
INSULATED TYPE

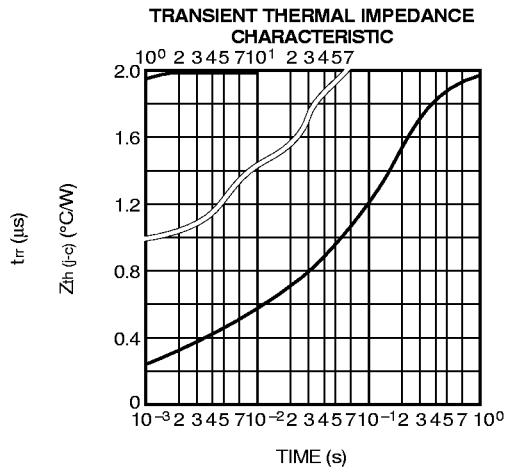
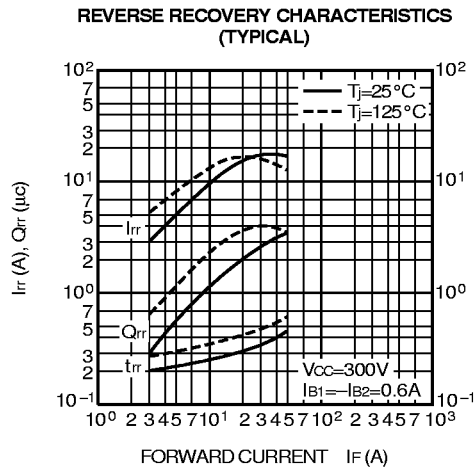
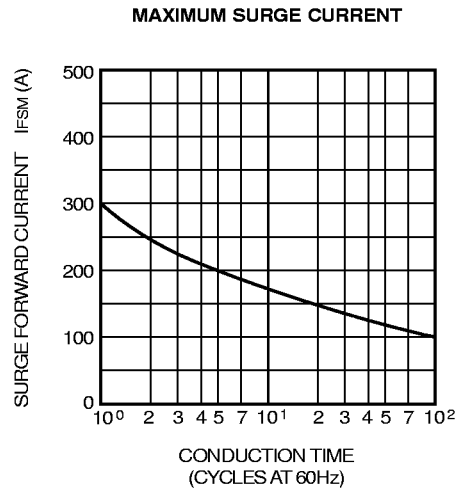
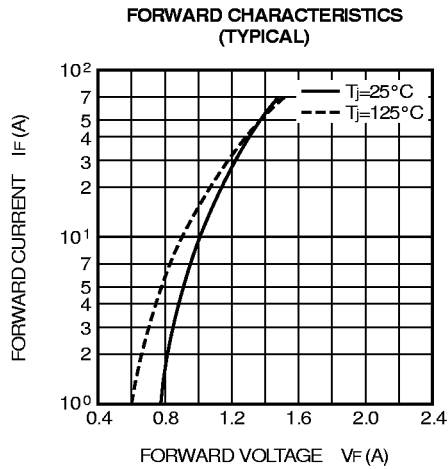


QM30E2Y/E3Y-H

MEDIUM POWER SWITCHING USE
INSULATED TYPE



PERFORMANCE CURVES (Diode part (D1))

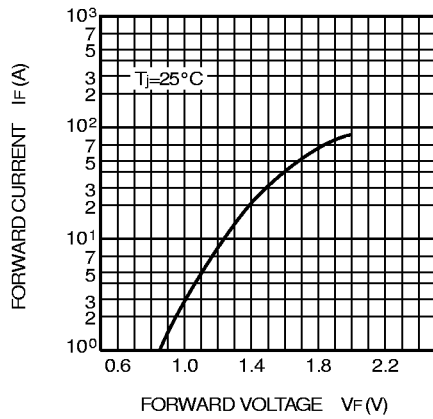


QM30E2Y/E3Y-H

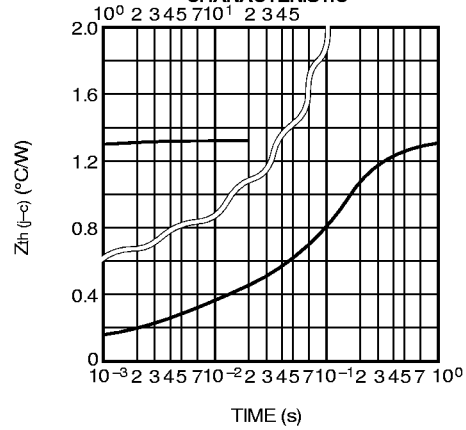
MEDIUM POWER SWITCHING USE
INSULATED TYPE

PERFORMANCE CURVES (Diode part (D2))

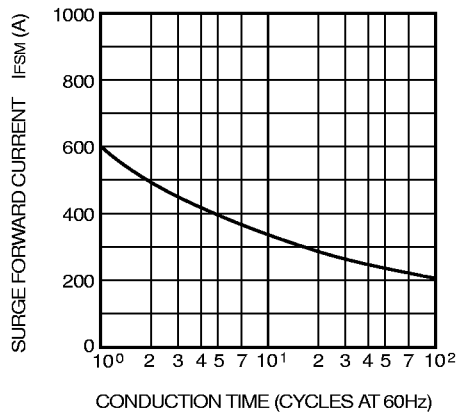
MAXIMUM FORWARD CHARACTERISTIC



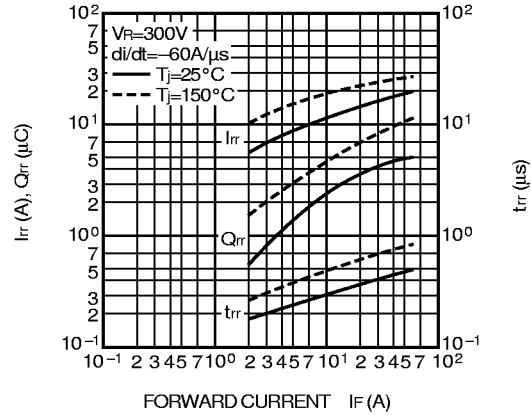
TRANSIENT THERMAL IMPEDANCE CHARACTERISTIC



MAXIMUM SURGE CURRENT



REVERSE RECOVERY CHARACTERISTICS (VS. I_F) (TYPICAL)



REVERSE RECOVERY CHARACTERISTICS (VS. di/dt) (TYPICAL)

