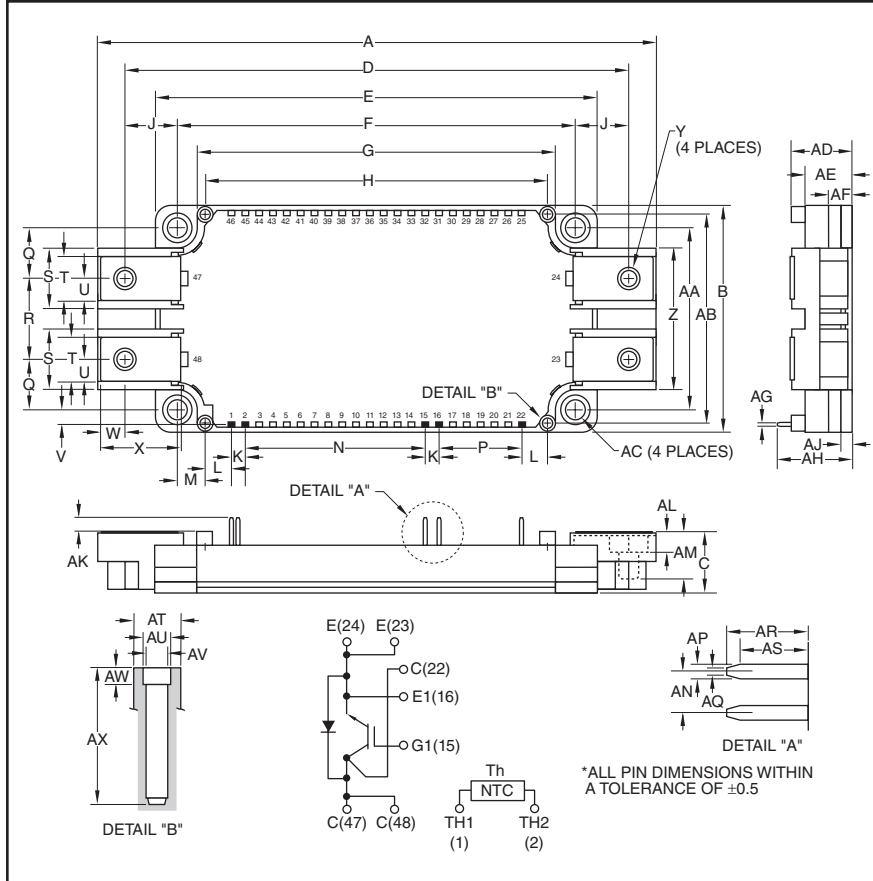


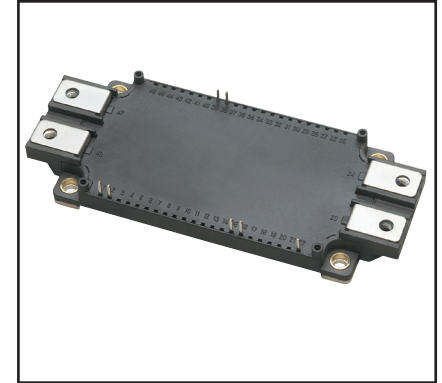
Single IGBTMOD™ NX-Series Module 600 Amperes/1200 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	5.98	152.0
B	2.44	62.0
C	0.67	17.0
D	5.39	137.0
E	4.79	121.7
F	4.33±0.02	110.0±0.5
G	3.89	99.0
H	3.72	94.5
J	0.53	13.5
K	0.15	3.8
L	0.28	7.25
M	0.30	7.75
N	1.95	49.54
P	0.9	22.86
Q	0.55	14.0
R	0.87	22.0
S	0.67	17.0
T	0.48	12.0
U	0.24	6.0
V	0.16	4.2
W	0.37	6.5
X	0.83	21.14
Y	M6	M6

Dimensions	Inches	Millimeters
Z	1.53	39.0
AA	1.97±0.02	50.0±0.5
AB	2.26	57.5
AC	0.22 Dia.	5.5 Dia.
AD	0.67+0.04/-0.02	17.0+1.0/-0.5
AE	0.51	13.0
AF	0.27	7.0
AG	0.03	0.8
AH	0.81	20.5
AJ	0.12	3.0
AK	0.14	3.5
AL	0.21	5.4
AM	0.49	12.5
AN	0.15	3.81
AP	0.05	1.15
AQ	0.025	0.65
AR	0.29	7.4
AS	0.24	6.2
AT	0.17 Dia.	4.3 Dia.
AU	0.10 Dia.	2.5 Dia.
AV	0.08 Dia.	2.1 Dia.
AW	0.06	1.5
AX	0.49	12.5



Description:

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of one IGBT Transistor in a single configuration with a reverse connected rectifier grade free-wheel diode. All components and interconnects are isolated from the heat sinking baseplate, offering simplified system assembly and thermal management.

Features:

- Low Drive Power
- Low $V_{CE(sat)}$
- Rectifier Grade Free-Wheel Diode
- Isolated Baseplate for Easy Heat Sinking

Applications:

- AC Motor Control
- Motion/Servo Control
- Photovoltaic/Fuel Cell

Ordering Information:

Example: Select the complete module number you desire from the table below -i.e. QIS1260015 is a 1200V (V_{CES}), 600 Ampere Single IGBTMOD™ Power Module.

QIS1260015
Single IGBTMOD™ NX-Series Module
 600 Amperes/1200 Volts

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

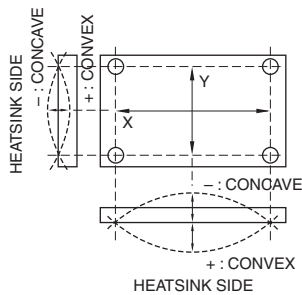
Characteristics	Symbol	QIS1260015	Units
Power Device Junction Temperature	T_j	-40 to 150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to 125	$^\circ\text{C}$
Mounting Torque, M5 Mounting Screws	—	31	in-lb
Mounting Torque, M6 Main Terminal Screws	—	40	in-lb
Module Weight (Typical)	—	330	Grams
Baseplate Flatness, On Centerline X, Y (See Below)	—	$\pm 0 \sim +100$	μm
Isolation Voltage (Terminals to Baseplate, $f = 60\text{Hz}$, AC 1 minute)	V_{ISO}	2500	Volts

Inverter Sector

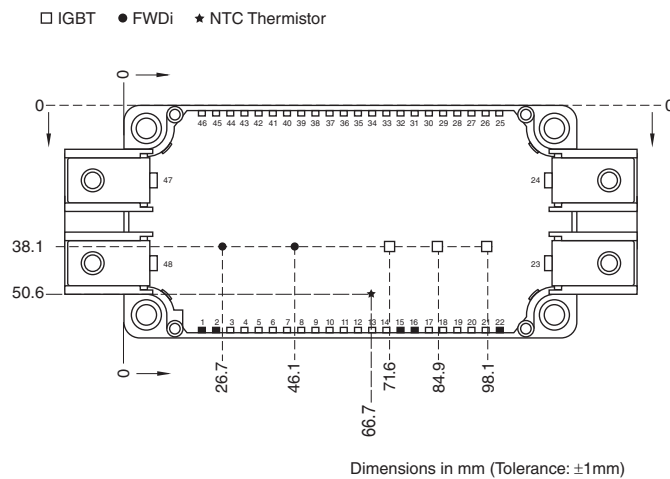
Collector-Emitter Voltage ($V_{GE} = 0\text{V}$)	V_{CES}	1200	Volts
Gate-Emitter Voltage ($V_{CE} = 0\text{V}$)	V_{GES}	± 20	Volts
Collector Current (DC, $T_C = 90^\circ\text{C}$) ^{*1,*5,*9}	I_C	600	Amperes
Peak Collector Current (Pulse) ^{*4}	I_{CM}	1200	Amperes
Maximum Collector Dissipation ($T_C = 25^\circ\text{C}$) ^{*1,*5}	P_C	3785	Watts
Emitter Current ($T_C = 25^\circ\text{C}$) ^{*1,*5,*9}	I_E^{*3}	600	Amperes
Peak Emitter Current (Pulse) ^{*4}	I_{EM}^{*3}	1200	Amperes

*1 Case temperature (T_C) and heatsink temperature (T_f) measured point is just under the chips.
 *3 Represent ratings and characteristics of the anti-parallel, emitter-to-collector free wheeling diode (FWDi).
 *4 Pulse width and repetition rate should be such that device junction temperature (T_j) does not exceed $T_{j(max)}$ rating.
 *5 Junction temperature (T_j) should not increase beyond maximum junction temperature ($T_{j(max)}$) rating.
 *9 Use both of each main terminal (collector and emitter) to connect external wiring.

BASEPLATE FLATNESS
MEASUREMENT POINT



CHIP LOCATION (TOP VIEW)



QIS1260015
Single IGBTMOD™ NX-Series Module
 600 Amperes/1200 Volts

Electrical and Mechanical Characteristics, T_j = 25°C unless otherwise specified

Inverter Sector

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units	
Collector Cutoff Current	I _{CES}	V _{CE} = V _{CES} , V _{GE} = 0V	—	—	1.0	mA	
Gate-Emitter Threshold Voltage	V _{GE(th)}	I _C = 60mA, V _{CE} = 10V	6	7	8	Volts	
Gate Leakage Current	I _{GES}	V _{GE} = V _{GES} , V _{CE} = 0V	—	—	0.5	μA	
Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _C = 600A, V _{GE} = 15V, T _j = 25°C* ⁶	—	2.0	2.6	Volts	
		I _C = 600A, V _{GE} = 15V, T _j = 125°C* ⁶	—	2.2	—	Volts	
		I _C = 600A, V _{GE} = 15V, T _j = 150°C* ⁶	—	1.9	—	Volts	
Input Capacitance	C _{ies}		—	—	100	nF	
Output Capacitance	C _{oes}	V _{CE} = 10V, V _{GE} = 0V	—	—	9.0	nF	
Reverse Transfer Capacitance	C _{res}		—	—	2.0	nF	
Total Gate Charge	Q _G	V _{CC} = 600V, I _C = 600A, V _{GE} = 15V	—	3000	—	nC	
Inductive	Turn-on Delay Time	t _{d(on)}	V _{CC} = 600V, I _C = 600A,		—	660	ns
	Turn-on Rise Time	t _r	V _{GE} = ±15V,		—	190	ns
Switch	Turn-off Delay Time	t _{d(off)}	R _G = 2.2Ω, I _E = 600A,		—	700	ns
	Turn-off Fall Time	t _f	Inductive Loas Switching Operation		—	600	ns
Emitter-Collector Voltage	V _{EC} ^{*3}	I _E = 600A, V _{GE} = 0V, T _j = 25°C* ⁶	—	1.0	1.2	Volts	
		I _E = 600A, V _{GE} = 0V, T _j = 125°C* ⁶	—	0.9	1.1	Volts	

Thermal and Mechanical Characteristics, T_j = 25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Module Lead Resistance	R _{lead}	Main Terminals-Chip (Per Switch)	—	0.6	—	mΩ
Thermal Resistance, Junction to Case* ¹	R _{th(j-c)Q}	Per IGBT	—	—	0.033	°C/W
Thermal Resistance, Junction to Case* ¹	R _{th(j-c)D}	Per FWDi	—	—	0.028	°C/W
Contact Thermal Resistance* ¹ (Case to Heatsink)	R _{th(c-f)}	Thermal Grease Applied (Per 1 Module)* ²	—	0.015	—	°C/W
Internal Gate Resistance	R _{Gint}	T _C = 25°C	0.7	1.0	1.3	Ω
		T _C = 125°C	1.4	2.0	2.6	Ω
External Gate Resistance	R _G		1.0	—	10	Ω

NTC Thermistor Sector, T_j = 25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Zero Power Resistance	R	T _C = 25°C	4.85	5.00	5.15	kΩ
Deviation of Resistance	ΔR/R	T _C = 100°C, R ₁₀₀ = 493Ω	-7.3	—	+7.8	%
B Constant	B _(25/50)	Approximate by Equation* ⁹	—	3375	—	K
Power Dissipation	P ₂₅	T _C = 25°C	—	—	10	mW

*1 Case temperature (T_C) and heatsink temperature (T_H) measured point is just under the chips.

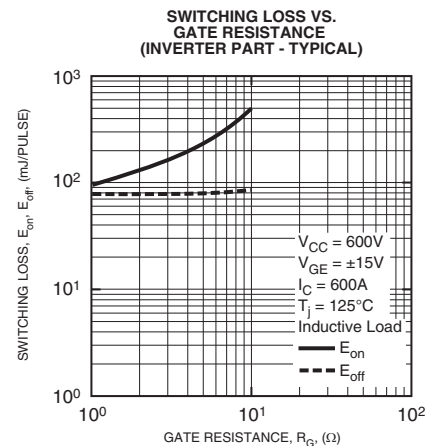
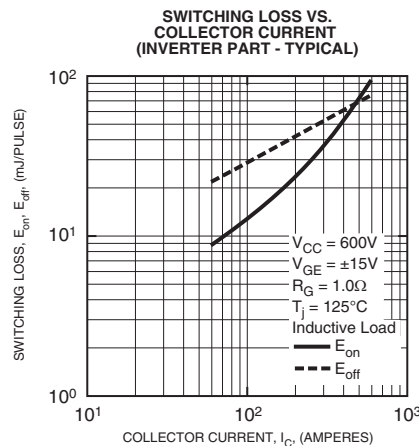
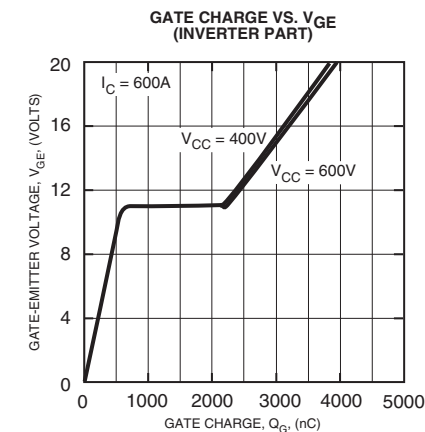
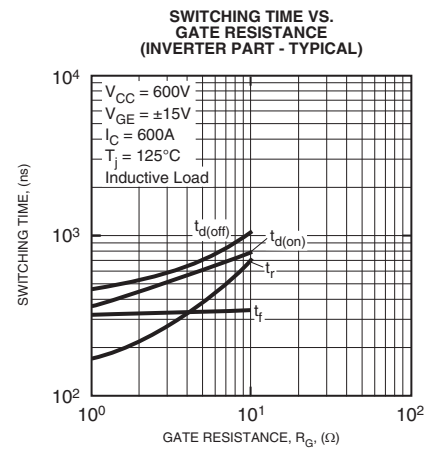
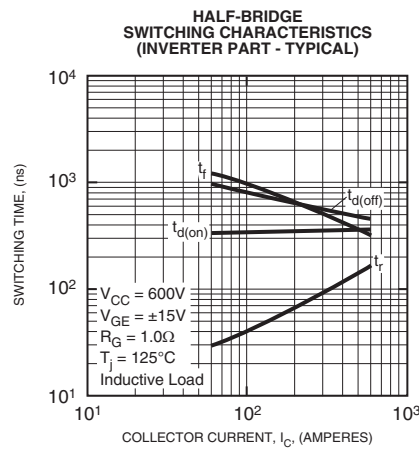
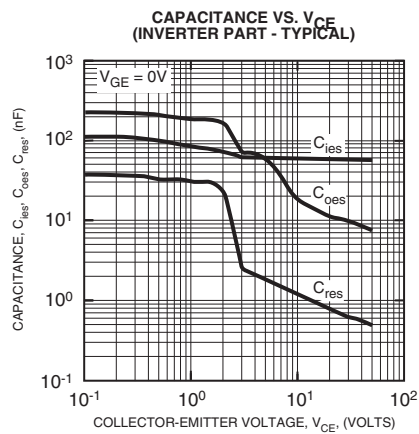
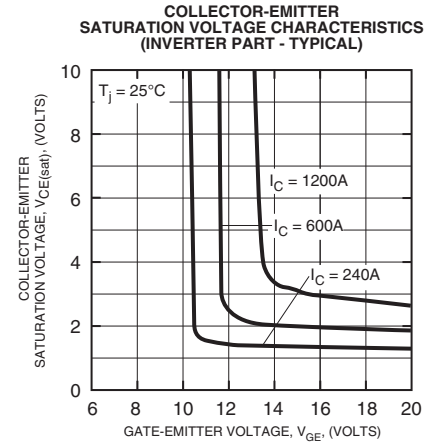
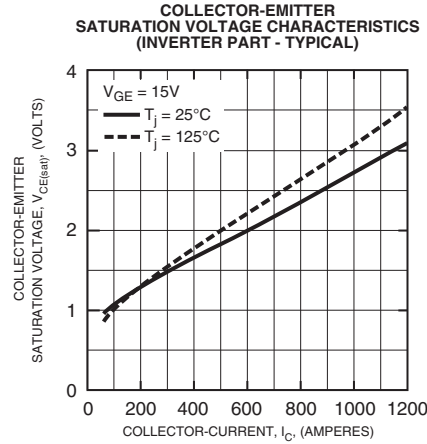
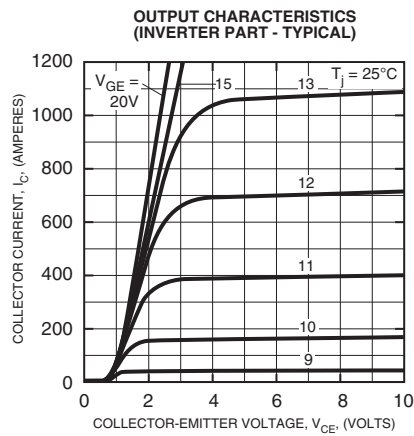
*2 Typical value is measured by using thermally conductive grease of λ = 0.9 [W/(m • K)].

*3 Represent ratings and characteristics of the anti-parallel, emitter-to-collector free wheeling diode (FWDi).

*6 Pulse width and repetition rate should be such as to cause negligible temperature rise.

*9 $B_{(25/50)} = \ln\left(\frac{R_{25}}{R_{50}}\right) / \left(\frac{1}{T_{25}} - \frac{1}{T_{50}}\right)$ R₂₅: Resistance at Absolute Temperature T₂₅ [K], R₅₀: resistance at Absolute Temperature T₅₀ [K],
 T₂₅ = 25 [°C] + 273.15 = 298.15 [K], T₅₀ = 50 [°C] + 273.15 = 323.15 [K]

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