

MITSUBISHI IGBT Module

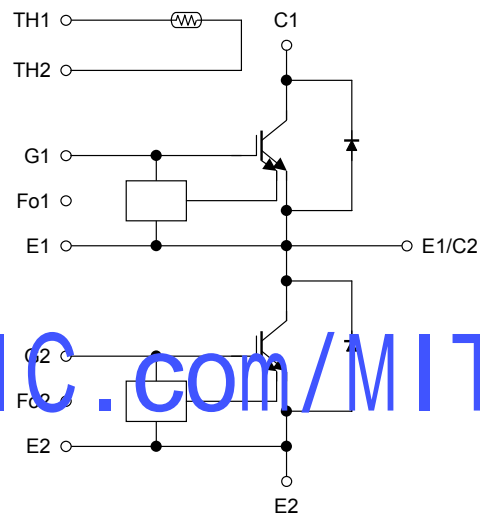
# MG400V2YS60A

High Power Switching Applications

Motor Control Applications

- The electrodes are isolated from case.
- Enhancement-mode
- Thermal output terminal (TH)

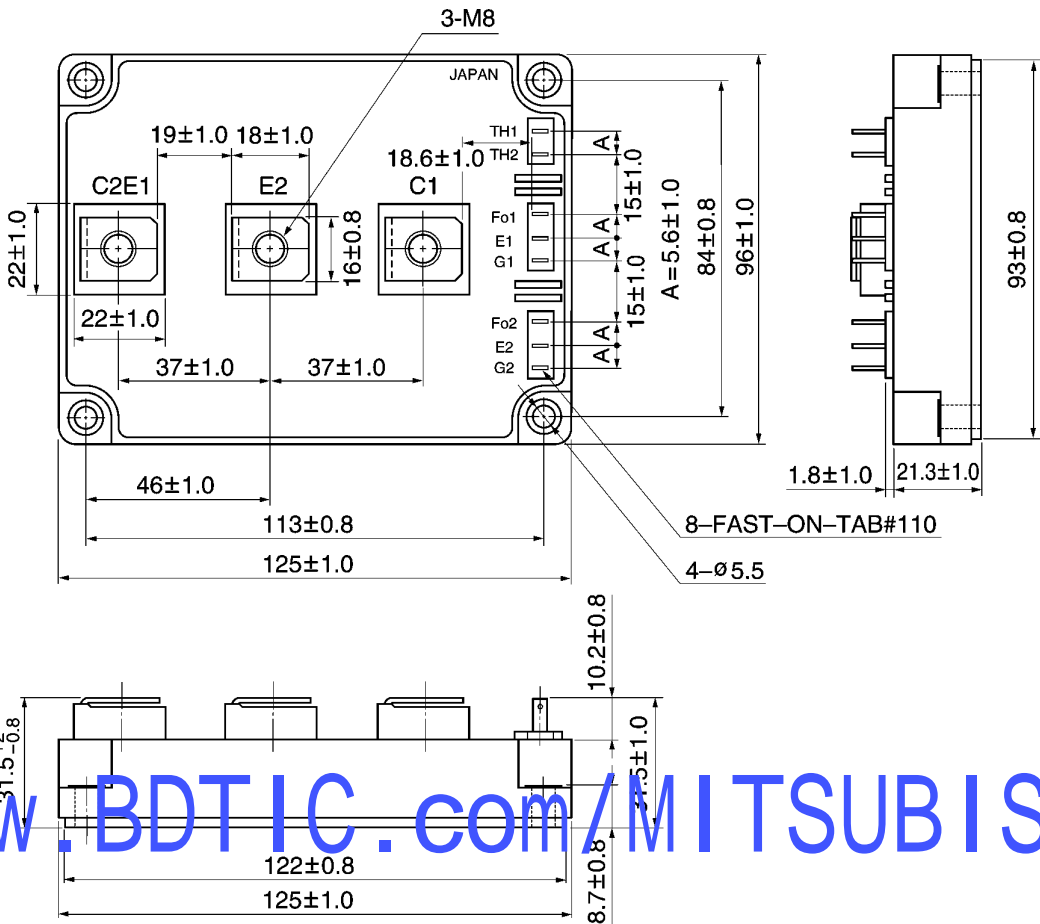
## Equivalent Circuit



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Package Dimensions

Unit: mm



Weight: 680 g (typ.)

## Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Collector-emitter voltage		V <sub>CES</sub>	1700	V
Gate-emitter voltage		V <sub>GES</sub>	±20	V
Collector current	DC	I <sub>C</sub>	400	A
Forward current	DC	I <sub>F</sub>	400	A
Collector power dissipation (T <sub>c</sub> = 25°C)		P <sub>C</sub>	4300	W
Junction temperature		T <sub>j</sub>	150	°C
Storage temperature range		T <sub>stg</sub>	-40~125	°C
Isolation voltage		V <sub>isol</sub>	4000 (AC 1 min)	V
Screw torque	Terminal: M8	—	10	N·m
	Mounting: M5	—	3	N·m

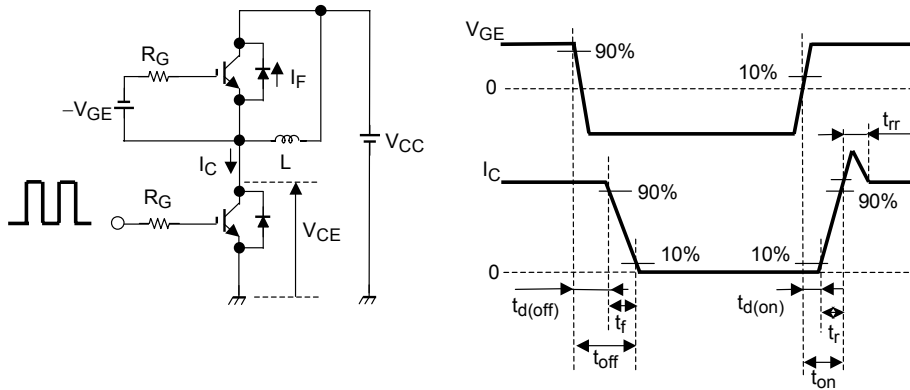
## Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Gate leakage current		I <sub>GES</sub>	V <sub>GE</sub> = ±20V, V <sub>CE</sub> = 0V	—	—	±10	μA
Collector cut-off current		I <sub>CES</sub>	V <sub>CE</sub> = 1700V, V <sub>GE</sub> = 0V	—	—	1	mA
Gate-emitter cut-off voltage		V <sub>GE(off)</sub>	I <sub>C</sub> = 400mA, V <sub>CE</sub> = 5V	4.5	5.5	6.5	V
Collector-emitter saturation voltage		V <sub>CE(sat)</sub>	I <sub>C</sub> = 400A V <sub>GE</sub> = 15V	T <sub>j</sub> = 25°C —	3.0	3.4	V
Input capacitance		C <sub>ies</sub>	V <sub>CE</sub> = 0V, V <sub>GE</sub> = 0V, f = 1MHz	—	43000	—	pF
Gate-emitter voltage		V <sub>GE</sub>	—	13	15	17	V
Gate resistance		R <sub>G</sub>	—	8.2	—	15	Ω
Switching time	Turn-on delay time	t <sub>d(on)</sub>	Inductive load	—	0.35	—	μs
	Rise time	t <sub>r</sub>	V <sub>CC</sub> = 900V	—	0.2	—	
	Turn-on time	t <sub>on</sub>	I <sub>C</sub> = 400A	—	0.55	—	
	Turn-off delay time	t <sub>d(off)</sub>	V <sub>GE</sub> = ±15V	—	0.9	—	
	Fall time	t <sub>f</sub>	R <sub>G</sub> = 8.2Ω	—	0.4	0.6	
	Turn-off time	t <sub>off</sub>	(Note)	—	1.3	—	
Forward voltage		V <sub>F</sub>	I <sub>F</sub> = 400A, V <sub>GE</sub> = 0V	T <sub>j</sub> = 25°C —	3.2	4.2	V
Reverse recovery time		t <sub>rr</sub>	I <sub>F</sub> = 400A, V <sub>GE</sub> = -15V di/dt = 2000A/μs	—	0.20	0.40	μs
Thermal resistance		R <sub>th(j-c)</sub>	Transistor stage	—	—	0.029	°C / W
			Diode stage	—	—	0.056	
RTC operating current		I <sub>rtc</sub>	T <sub>j</sub> = 25°C	800	—	—	A

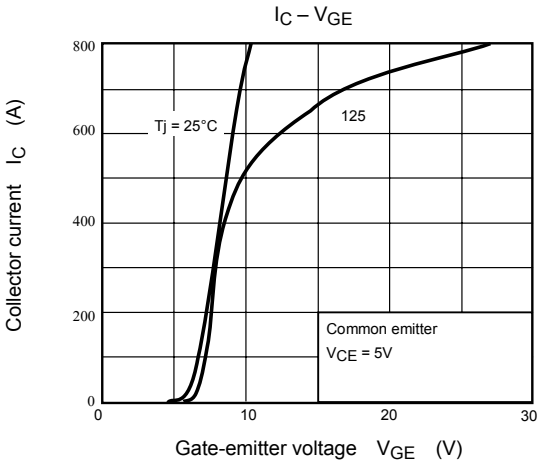
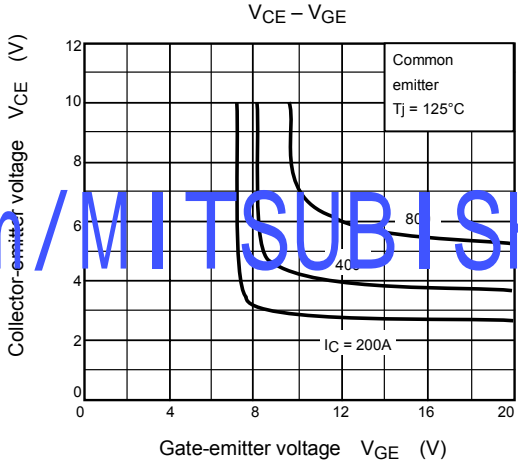
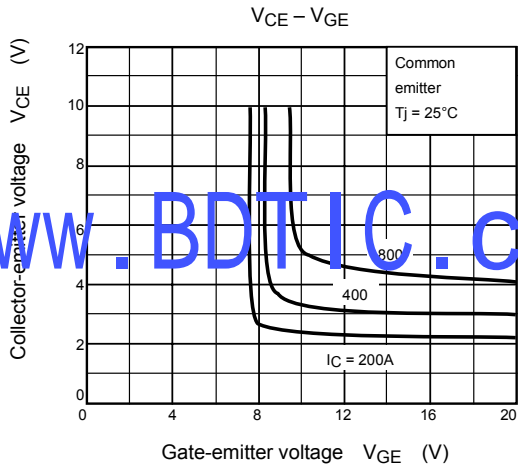
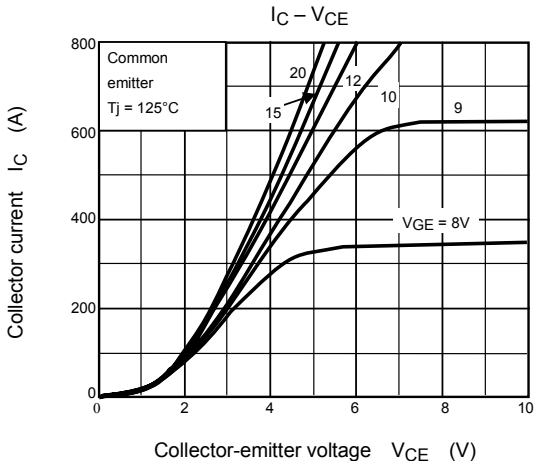
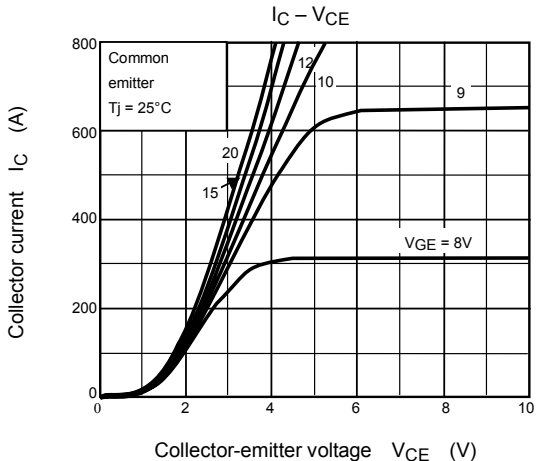
**Thermistor**

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Zero power resistance	R25	T <sub>c</sub> = 25°C	—	100	—	kΩ
B value	R25 / 85	T <sub>c</sub> = 25°C / T <sub>c</sub> = 85°C	—	4390	—	K
Isolation voltage		T <sub>c</sub> = 25°C	2500	—	—	V <sub>rms</sub>

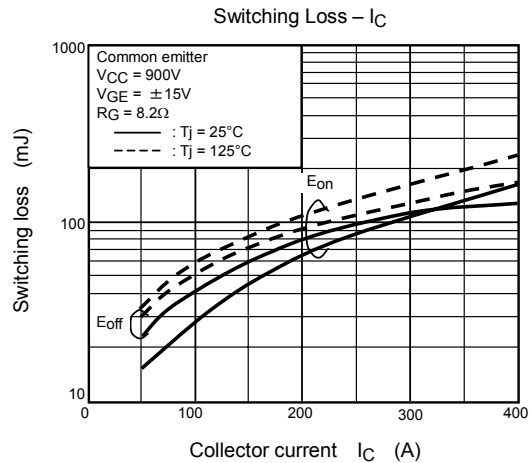
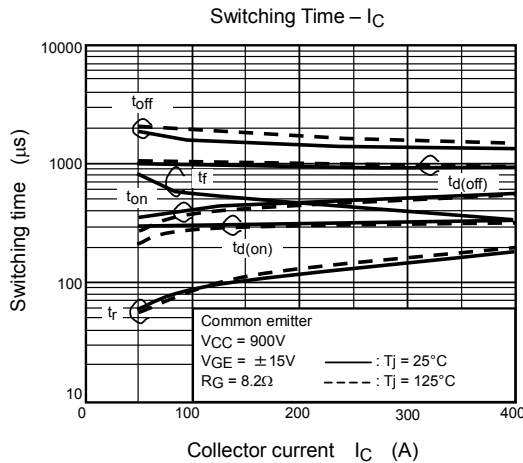
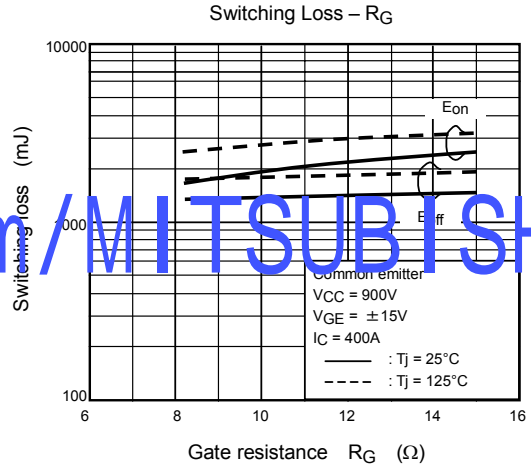
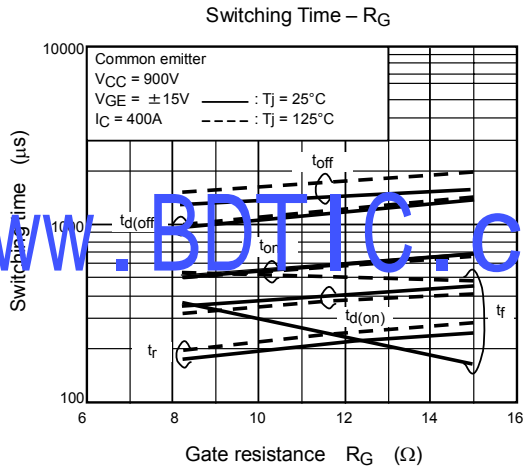
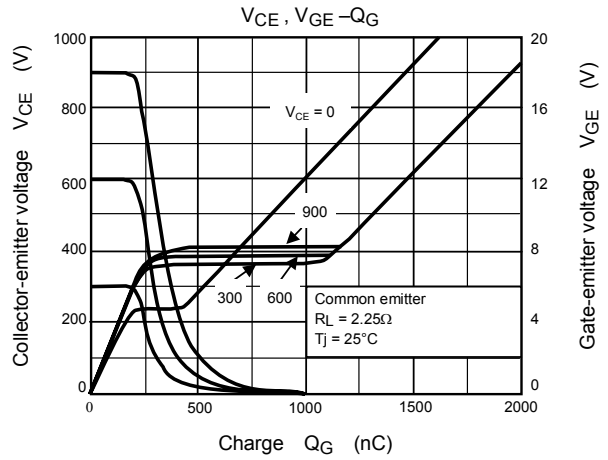
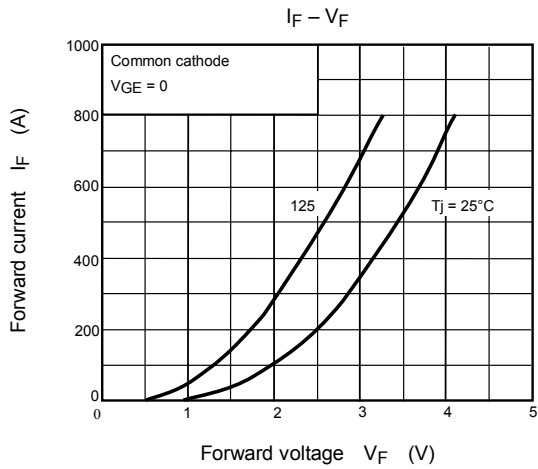
(Note) : Switching time measurement circuit and input / output waveforms



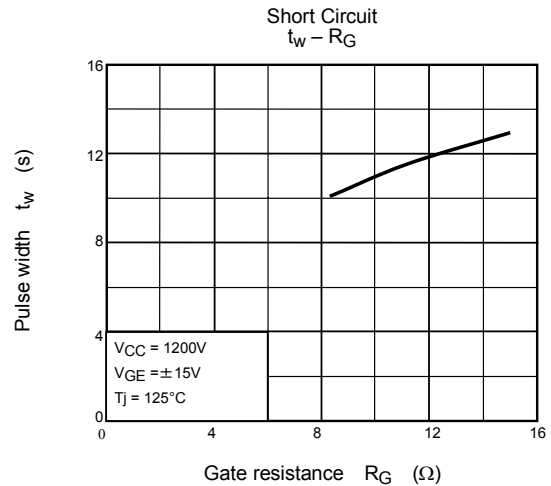
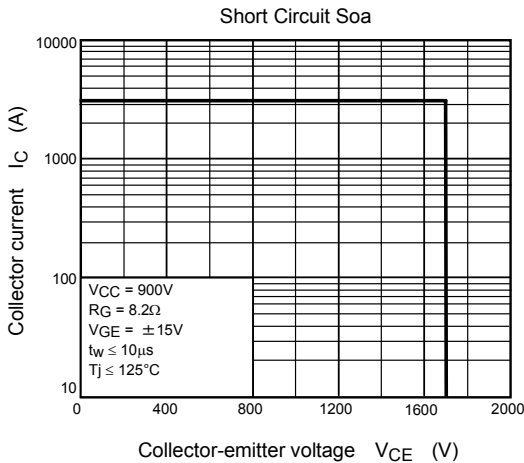
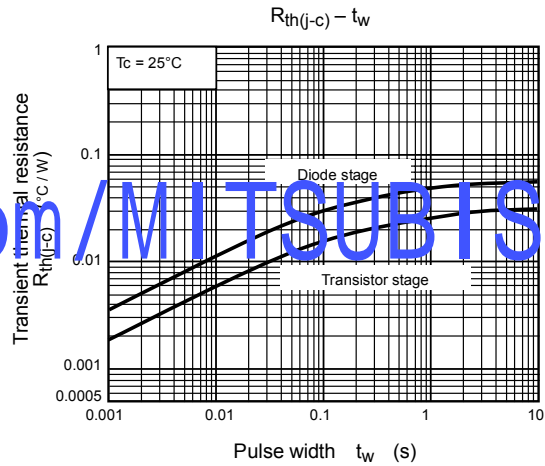
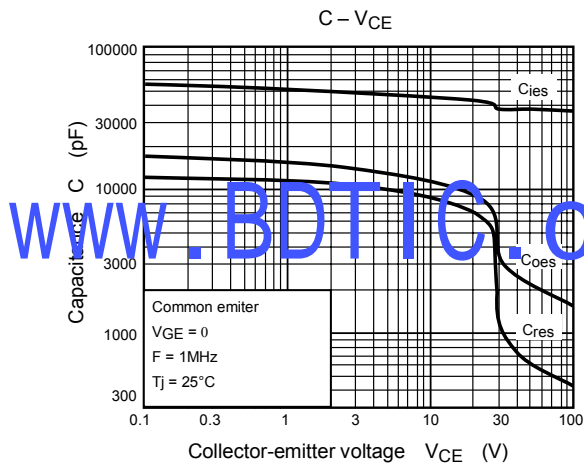
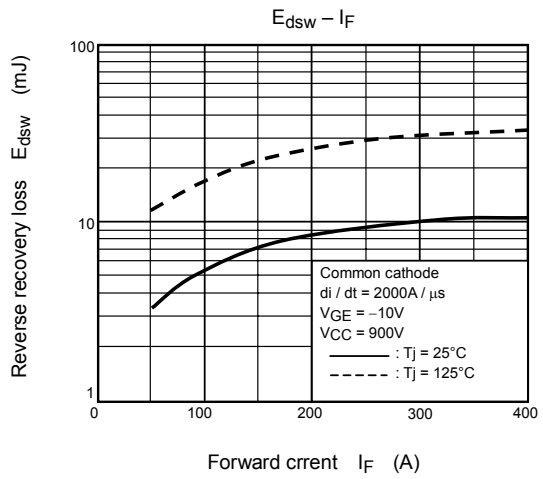
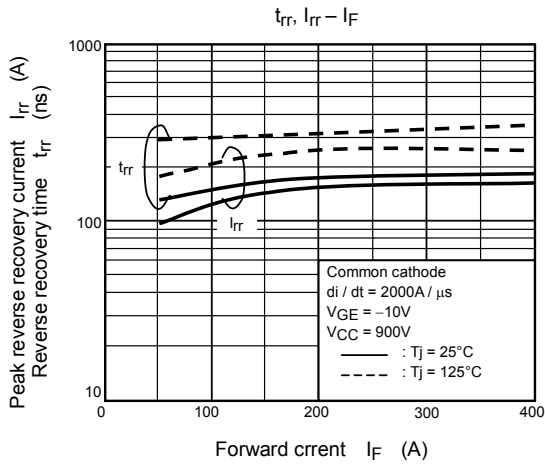
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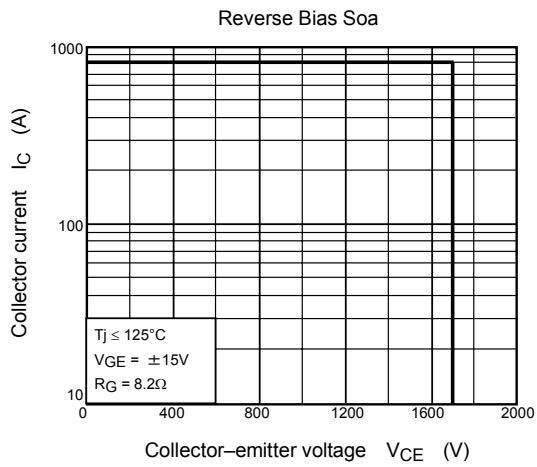
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<V<sub>CE(sat)</sub> Rank>

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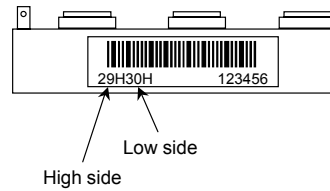
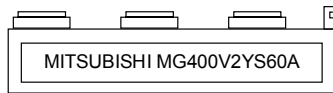
Rank Symbol	Min.	Max.
29	2.6	2.9
30	2.7	3.0
31	2.8	3.1
32	2.9	3.2
33	3.0	3.3
34	3.1	3.4

<V<sub>F</sub> Rank>

V<sub>F</sub>

Rank Symbol	Min	Max.
G	2.5	2.8
H	2.7	3.0
I	2.9	3.2
J	3.1	3.4
K	3.3	3.6
L	3.5	3.8
M	3.7	4.0
N	3.9	4.2

<Mark Position>



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