

TOSHIBA IGBT MODULE SILICON N CHANNEL IGBT

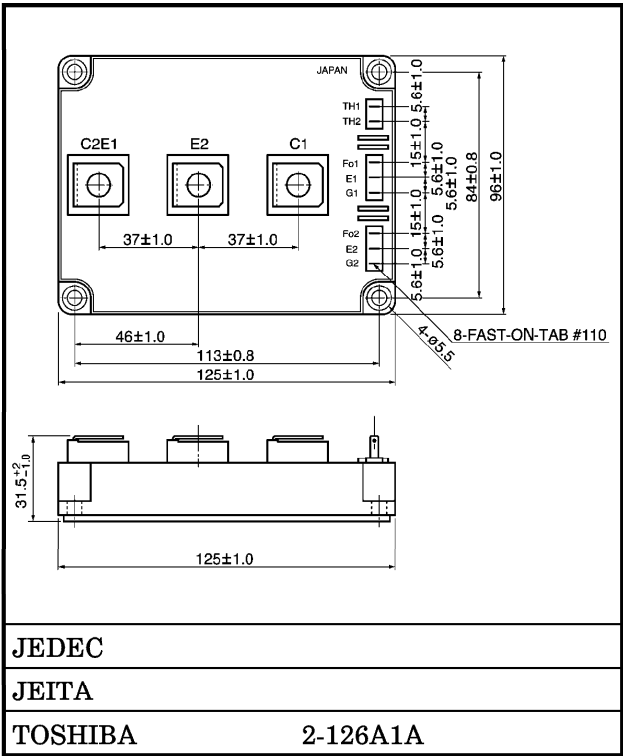
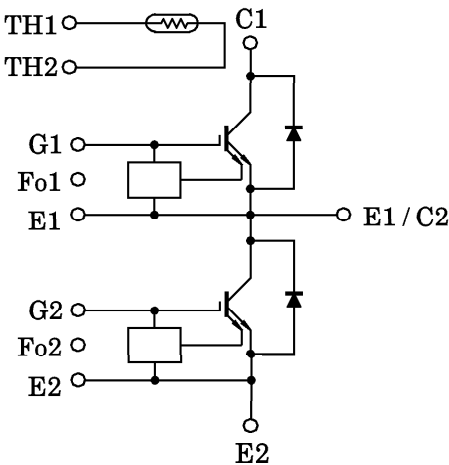
MG400V2YS60A

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

- The Electrodes are Isolated from Case.
- Enhancement-Mode
- Thermal Output Terminal (TH)

EQUIVALENT CIRCUIT



JEDEC

JEITA

TOSHIBA

2-126A1A

Weight : 680 g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V _{CES}	1700	V
Gate-Emitter Voltage		V _{GES}	± 20	V
Collector Current	DC	I _C	400	A
Forward Current	DC	I _F	400	A
Collector Power Dissipation (T _c = 25°C)		P _C	4300	W
Junction Temperature		T _j	150	°C
Storage Temperature Range		T _{stg}	- 40~125	°C
Isolation Voltage		V _{Isol}	4000 (AC 1 min)	V
Screw Torque	Terminal : M8	—	10	N·m
	Mounting : M5	—	3	N·m

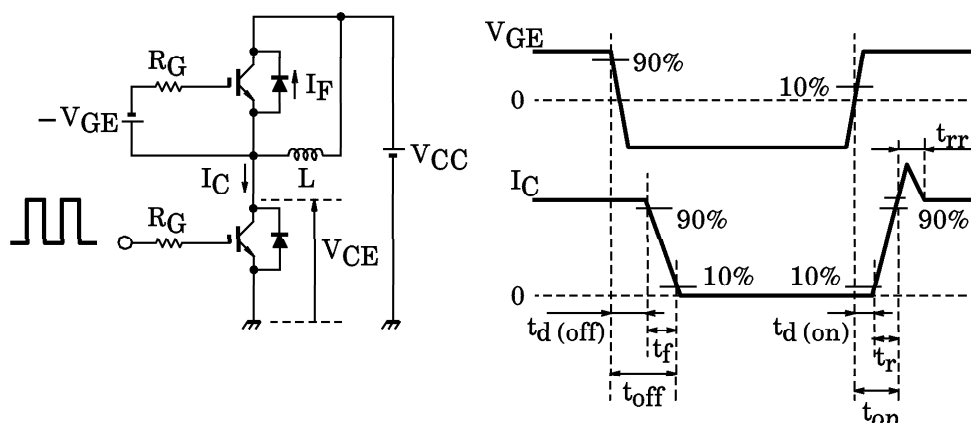
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

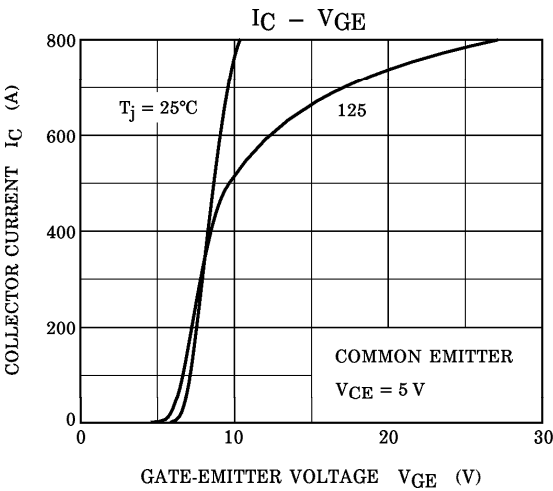
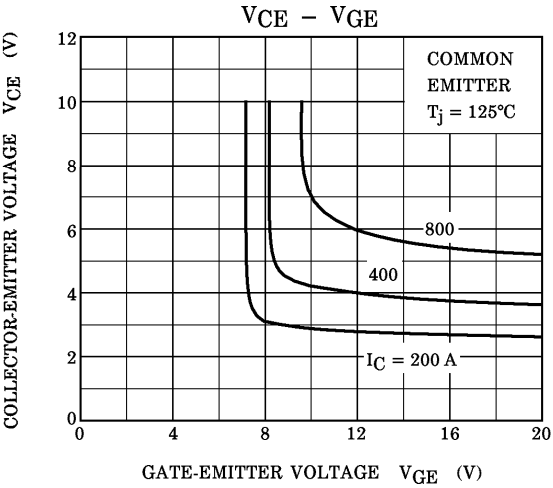
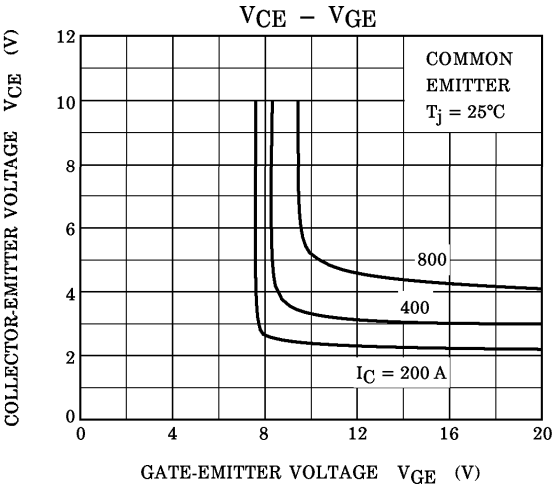
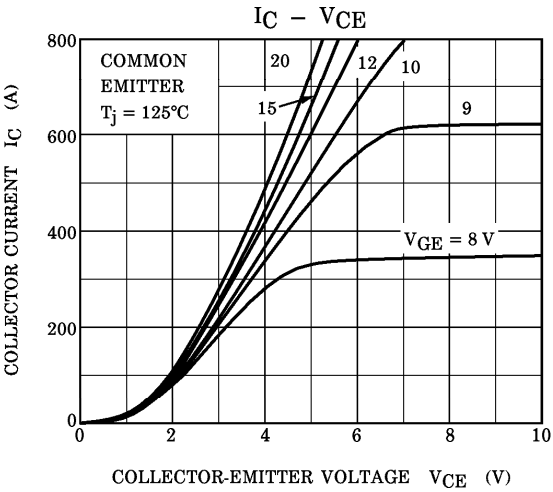
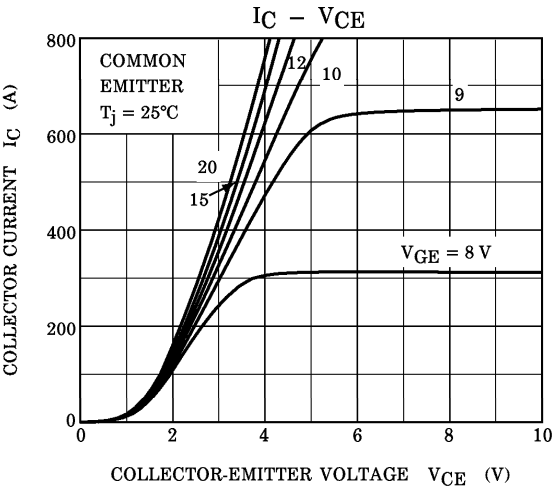
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	I_{GES}	$V_{GE} = \pm 20 \text{ V}$, $V_{CE} = 0 \text{ V}$	—	—	± 10	μA
Collector Cut-Off Current	I_{CES}	$V_{CE} = 1700 \text{ V}$, $V_{GE} = 0 \text{ V}$	—	—	1	mA
Gate-Emitter Cut-Off Voltage	$V_{GE}(\text{off})$	$I_C = 400 \text{ mA}$, $V_{CE} = 5 \text{ V}$	—	5.5	—	V
Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_C = 400 \text{ A}$, $V_{GE} = 15 \text{ V}$	$T_j = 25^\circ\text{C}$	3.0	3.4	V
			$T_j = 125^\circ\text{C}$	3.8	4.2	
Input Capacitance	C_{ies}	$V_{CE} = 10 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$	—	45000	—	pF
Gate-Emitter Voltage	V_{GE}	—	13	15	17	V
Gate Resistance	R_G	—	8.2	—	15	Ω
Switching Time	Turn-On Delay Time	Inductive Load $V_{CC} = 900 \text{ V}$ $I_C = 400 \text{ A}$ $V_{GE} = \pm 15 \text{ V}$ $R_G = 8.2 \Omega$ (Note)	—	0.35	—	μs
	Rise Time		—	0.2	—	
	Turn-On Time		—	0.55	—	
	Turn-Off Delay Time		—	0.9	—	
	Fall Time		—	0.4	0.6	
	Turn-Off Time		—	1.3	—	
Forward Voltage	V_F	$I_F = 400 \text{ A}$, $V_{GE} = 0 \text{ V}$	$T_j = 25^\circ\text{C}$	3.2	4.2	V
			$T_j = 125^\circ\text{C}$	2.4	—	
Reverse Recovery Time	t_{rr}	$I_F = 400 \text{ A}$, $V_{GE} = -15 \text{ V}$ $di/dt = 2000 \text{ A} / \mu\text{s}$	—	0.20	0.40	μs
Thermal Resistance	$R_{th(j-e)}$	Transistor Stage	—	—	0.029	$^\circ\text{C} / \text{W}$
		Diode Stage	—	—	0.056	
RTC Operating Current	I_{rtc}	$T_j = 25^\circ\text{C}$	800	—	—	A

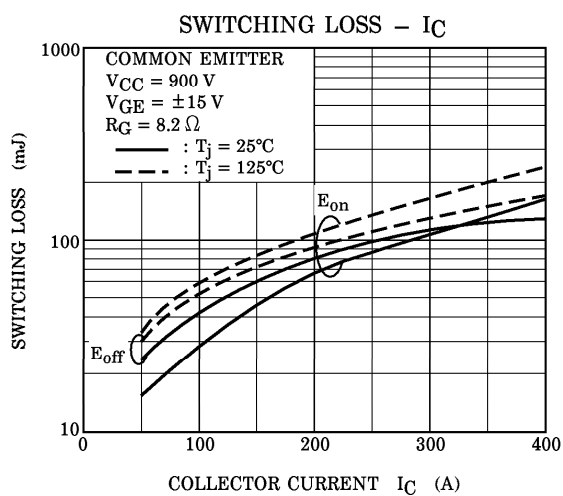
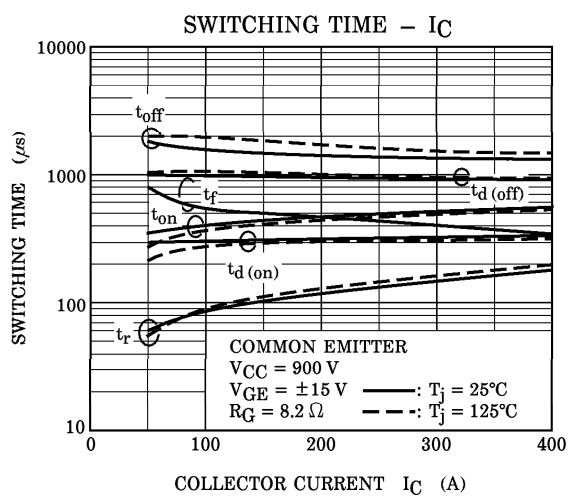
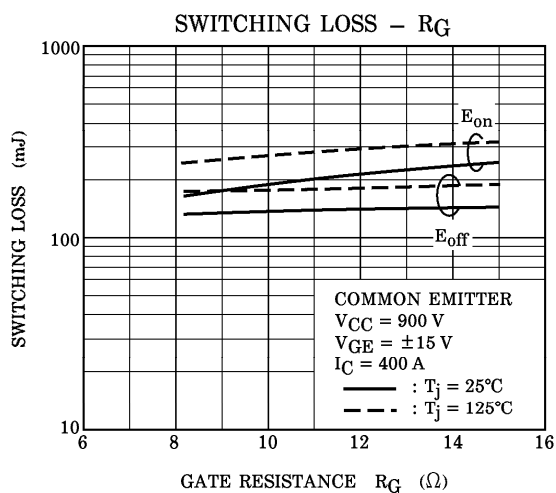
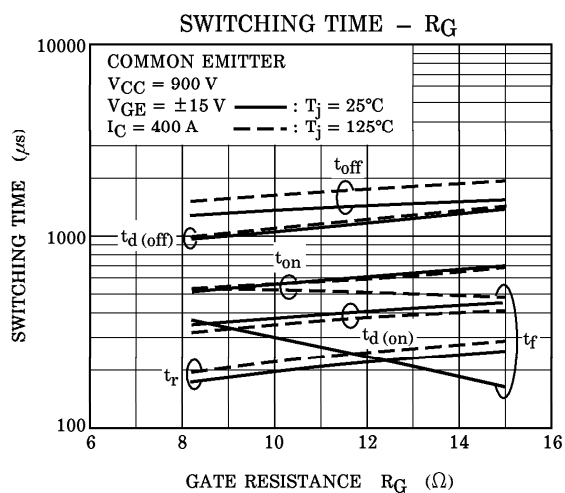
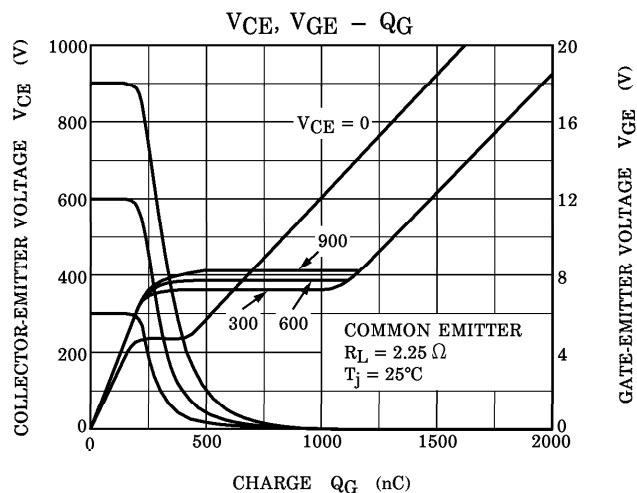
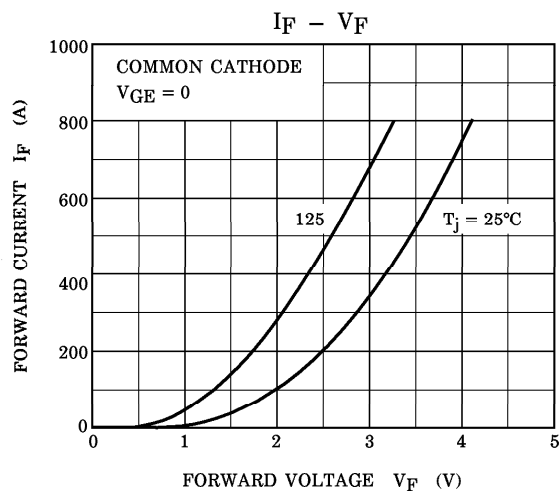
THERMISTOR

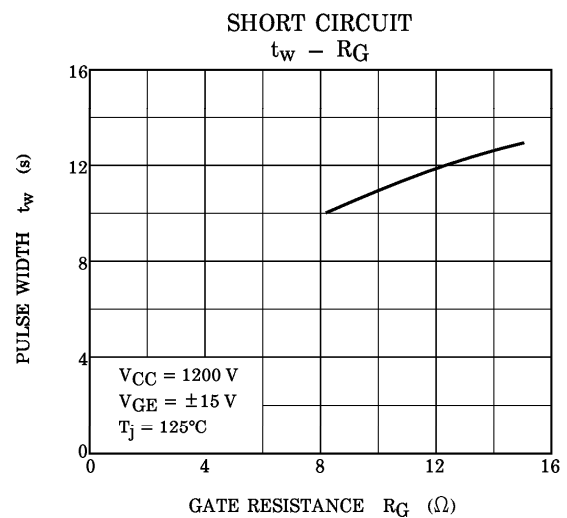
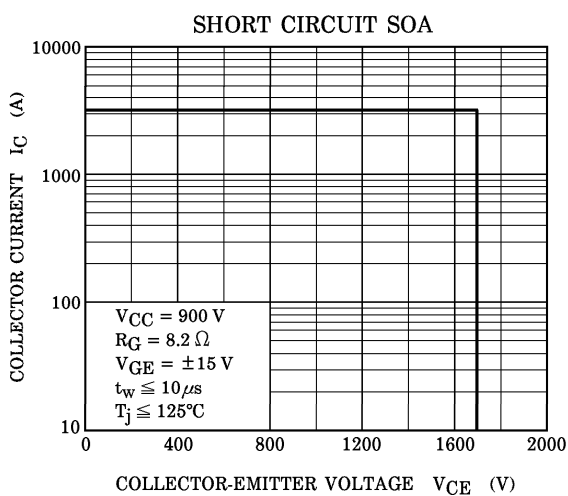
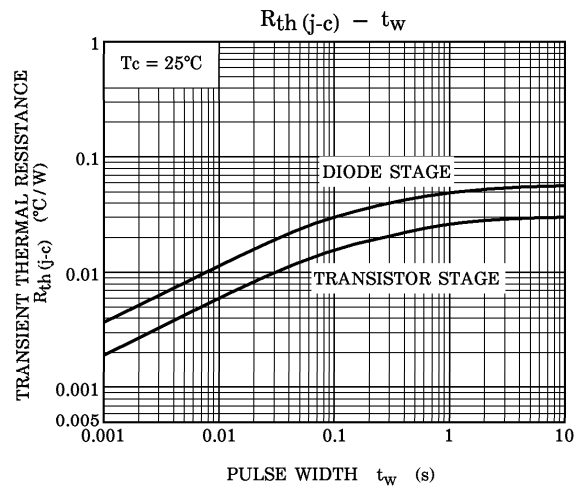
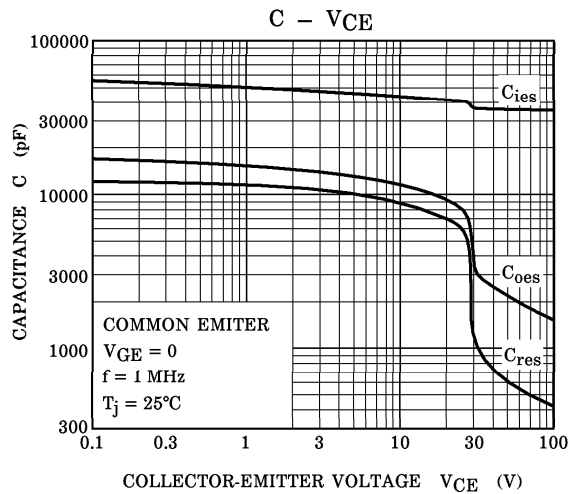
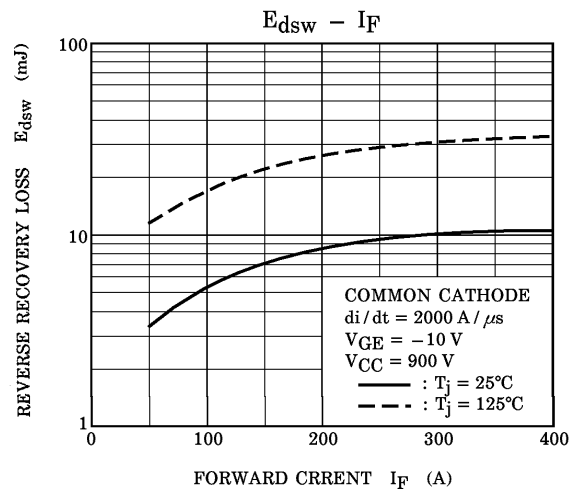
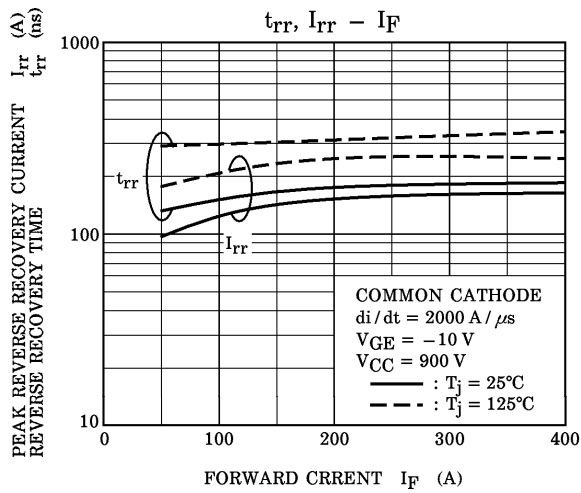
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Zero Power Resistance	R_{25}	$T_c = 25^\circ\text{C}$	—	100	—	$\text{k}\Omega$
B Value	$B_{25/85}$	$T_c = 25^\circ\text{C} / T_c = 85^\circ\text{C}$	—	4390	—	K
Isolation Voltage		$T_c = 25^\circ\text{C}$	2500	—	—	Vrms

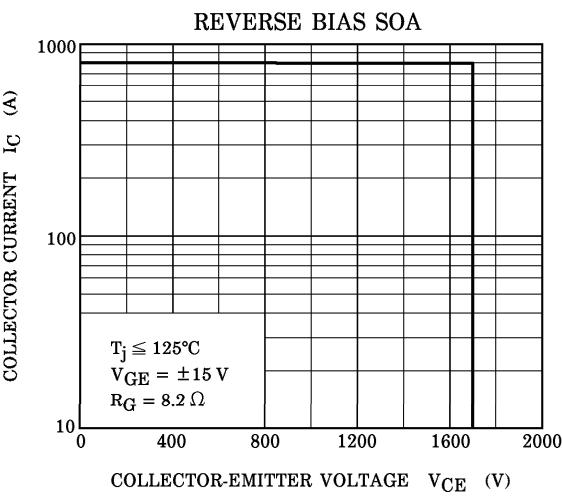
(Note) : Switching time measurement circuit and input/output waveforms











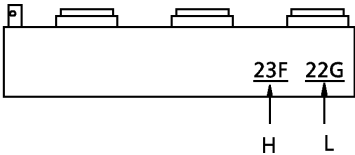
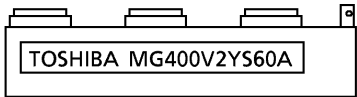
<V_{CE} (sat) RANK>
V_{CE} (sat)

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_F RANK>
V_F

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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