PARA LIGHT ELECTRONICS CO., LTD.
11F., No. 8, Jiankang Rd., Zhonghe Dist., New Taipei City 235, Taiwan,
Tel: 886-2-2225-3733 Fax: 886-2-2225-4800
E-mail: para@para.com.tw http://www.para.com.tw

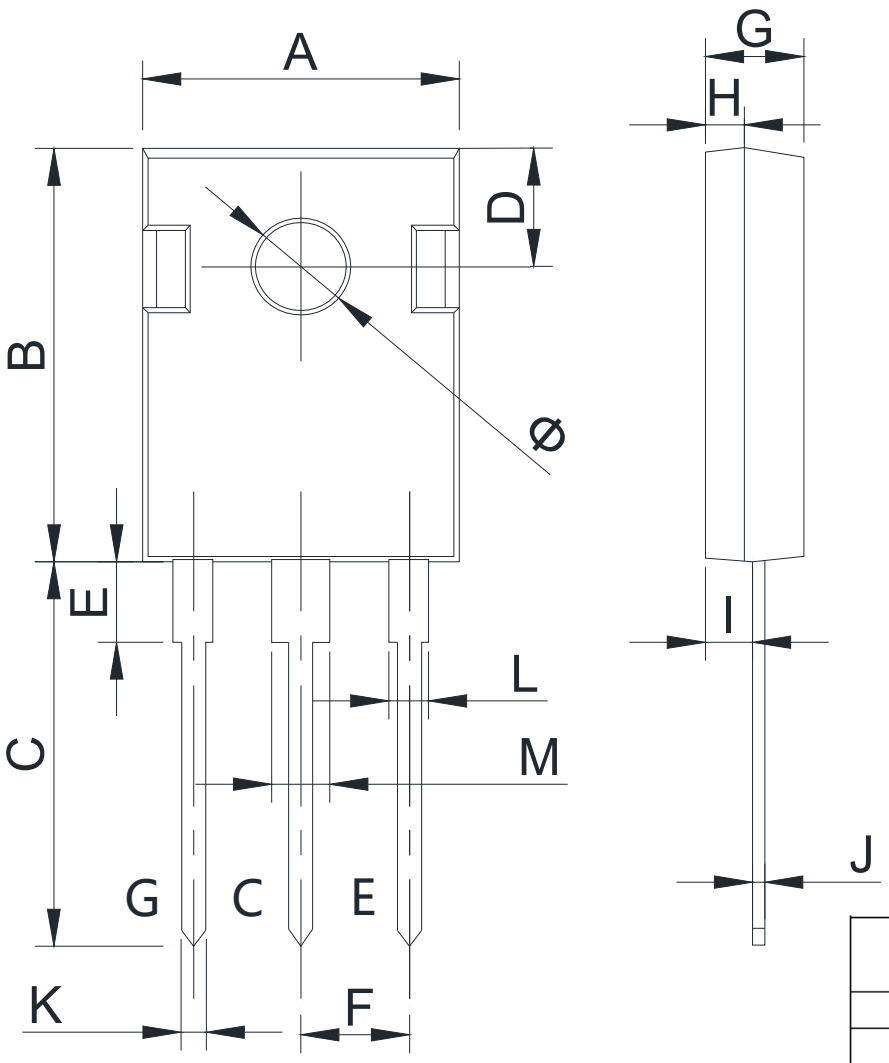
DATA SHEET

PART NO. : PC20H060AA

REV : A / 0

CUSTOMER'S APPROVAL : _____ DCC : _____

Package Dimensions



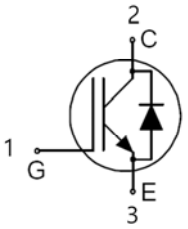
DIM	MILLIMETERS	
	MIN	MAX
A	15.75	15.85
B	20.9	21.05
C	19.85	20.05
D	5.75	5.85
E	4.15	4.25
F	5.44BSC.	
G	4.95	5.05
H	1.97	2.03
I	2.35	2.45
J	0.6	0.65
K	1.17	1.25
L	1.95	2.05
M	2.85	3.11
ϕ	3.5	3.7

Features

600V, 20A

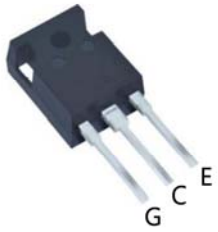
$V_{CE(sat)(typ.)}$ =1.70V, I_C=20A

Maximum Junction Temperature 175℃



Applications

Motor control



Key Performance and Package Parameters

V_{CE}	I_C	V_{CEsat}, T_{vj}=25℃	T_{vjmax}
600V	20A	1.7V	175℃

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{CES}	Collector-Emitter Voltage(T_{vj}=25℃)	600	V
V_{GES}	Gate-Emitter Voltage(T_{vj}=25℃)	±30	V
I_C	Continuous Collector Current(T_C =25℃)	40	A
	Continuous Collector Current (T_C =100℃)	20	A
I_{CM}	Pulsed Collector Current (Note 1) (T_{vj}≤175℃)	80	A
I_F	Diode Forward Current (T_C =25℃)	40	A
	Diode Forward Current (T_C = 100℃)	20	A
I_{FRM}	Diode pulsed current(T_{vj}≤175℃)	80	A
P_D	Maximum Power Dissipation (T_C=25 ℃)	176	W
T_J	Operating Junction Temperature Range	-40 to175	℃
T_{STG}	Storage Temperature Range	-50 to 150	℃

Thermal Data

Symbol	Parameter	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case for IGBT	0.85	K/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case for Diode	1.4	K/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	40	K/W

Electrical Characteristics (Tc=25℃ unless otherwise noted.)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{CES}	Collector-Emitter Breakdown Voltage	V_{GE} = 0V, Ic =0.5mA,Tvj=25℃	600	---	---	V
I_{CES}	Collector-Emitter Leakage Current	V_{CE}=600V,V_{GE}=0V, Tvj=175℃	---	---	300	uA
I_{GES}	Gate Leakage Current, Forward	V_{GE}=30V,V_{CE}=0V, Tvj=125℃	-200	---	+200	nA
$V_{GE(th)}$	Gate Threshold Voltage	V_{GE}= V_{CE},Ic =1mA ， Tvj=25℃	4.5	5.6	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	V_{GE}=15V, I_C=20A, Tvj=25℃	---	1.7	2.1	V
		V_{GE}=0V,I_C=20A, Tvj=175℃	---	2.2	---	V
Q_G	Total Gate Charge	I_C=20A,V_{CE}=480V, V_{GE}=15V, Tvj=25℃	---	73	---	nC
Q_{GE}	Gate-Emitter Charge		---	9	---	nC
Q_{GC}	Gate-Collector Charge		---	38	---	nC
$t_{d(on)}$	Turn-on Delay Time(T_{vj}=25℃)	VCC=400V IC=20A RG(on)=10Ω RG(off)=10Ω C=0nF VGE=15V Lload=400μH	---	27	---	ns
	Turn-on Delay Time(T_{vj}=175℃)		---	26		ns
t_r	Turn-on Rise Time(T_{vj}=25℃)		---	33	---	ns
	Turn-on Rise Time(T_{vj}=175℃)		---	37		ns
$t_{d(off)}$	Turn-off Delay Time(T_{vj}=25℃)		---	109	---	ns
	Turn-off Delay Time(T_{vj}=175℃)		---	140		ns
t_f	Turn-off Fall Time(T_{vj}=25℃)		---	45	---	ns
	Turn-off Fall Time(T_{vj}=175℃)		---	94		ns
E_{on}	Turn-on Switching Loss(T_{vj}=25℃)		---	480	---	mJ
	Turn-on Switching Loss(T_{vj}=175℃)		---	956	---	mJ
E_{off}	Turn-off Switching Loss(T_{vj}=25℃)		---	353	---	mJ
	Turn-off Switching Loss(T_{vj}=175℃)		---	600	---	mJ

Electrical Characteristics (Tc=25℃ unless otherwise noted.)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
C_{ies}	Input Capacitance	V_{GE} = 0V,V_{CE}= 25V, f = 1MHz, T_{vj}=25℃	---	1230	---	pF
C_{oes}	Output Capacitance		---	57	---	pF
C_{res}	Reverse Transfer Capacitance		---	30	---	pF
R_g	Internal gate resistor		---	0	---	Ω

Diode Characteristics (TC=25℃ unless otherwise noted)

Symbol	Parameter	Conditions		Min.	Typ.	Max.	Unit
V_F	Diode Forward Voltage	V_{GE}=0V,I_F=20A,T_{vj}=25℃		---	1.5	2.2	V
		V_{GE}=0V,I_F=20A,T_{vj}=175℃		---	1.35	---	V
t_{rr}	Diode Reverse Recovery Time	I_F = 20A, V_R=400V, di_F/dt=-500A/μs	Tvj=25℃	---	100	---	ns
	Diode Reverse Recovery Time		Tvj=175℃	---	211	---	ns
Qrr	Diode Reverse Recovery Charge		Tvj=25℃	---	390	---	nC
			Tvj=175℃	---	1449	---	
I_{rr}	Diode peak Reverse Recovery Current		Tvj=25℃	---	8	---	A
	Diode peak Reverse Recovery Current		Tvj=175℃	---	15	---	A
dirr/dt	Peak rate of irr		Tvj=25℃	---	119	---	A/μs
	Peak rate of irr		Tvj=175℃	---	172	---	A/μs
E_{rec}	Reverse recovery energy		Tvj=25℃	---	79	---	μJ
	Reverse recovery energy		Tvj=175℃	---	316	---	μJ

Note1：Repetitive rating, pulse width limited by maximum junction temperature

PARA ight

Trench Field-Stop Technology IGBT

PC20H060AA

REV:A / 0

Typical Characteristics

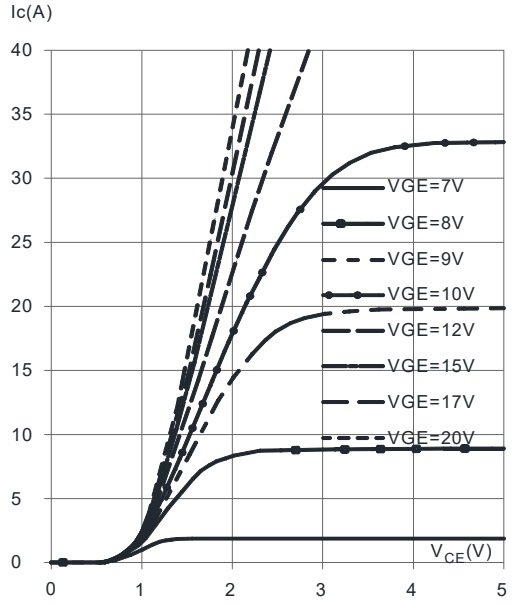


Fig. 1 Typical Output Characteristic (T_c=25℃)

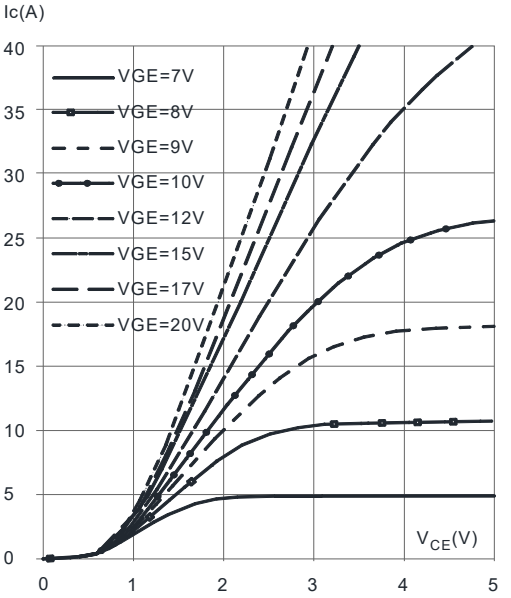


Fig. 2 Typical Output Characteristic (T_c=175℃)

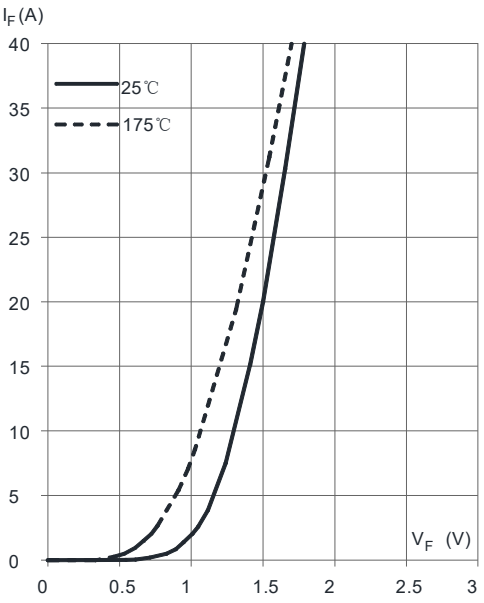


Fig. 3 Typical IF as a function of VF

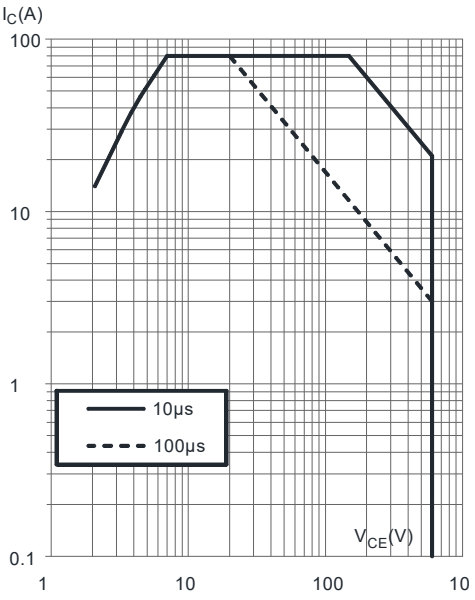


Fig. 4 Forward bias safe operating area

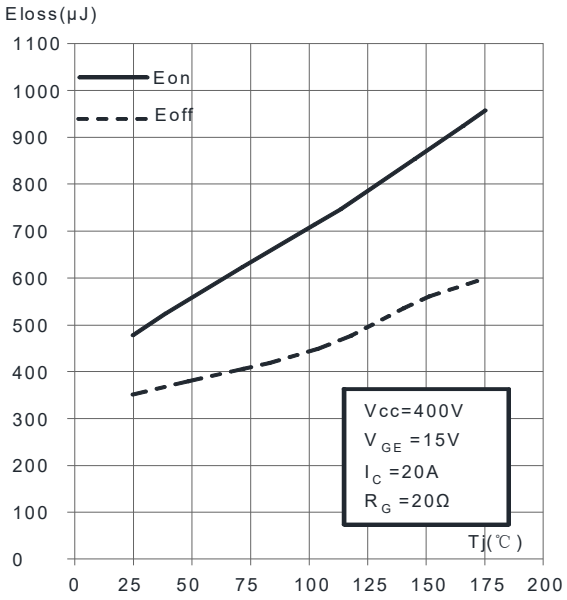


Fig. 5 TTypical switching losses as Tj

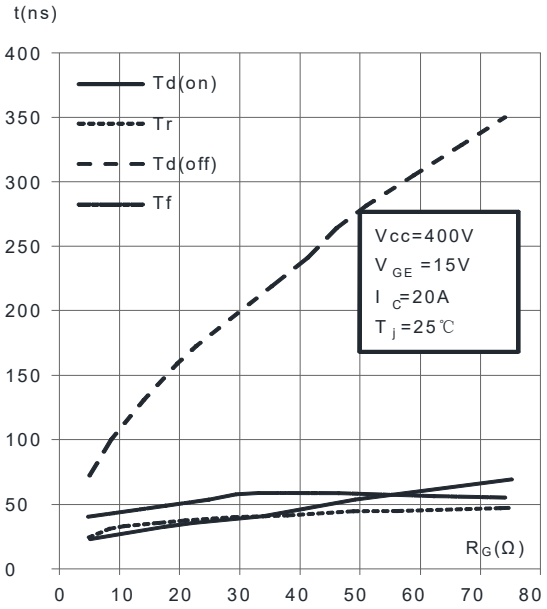


Fig. 6 Switching times as RG

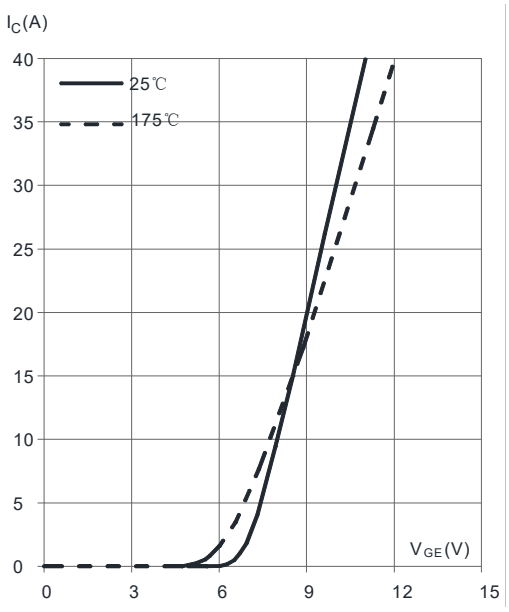


Fig. 7 Typical transfer characteristic

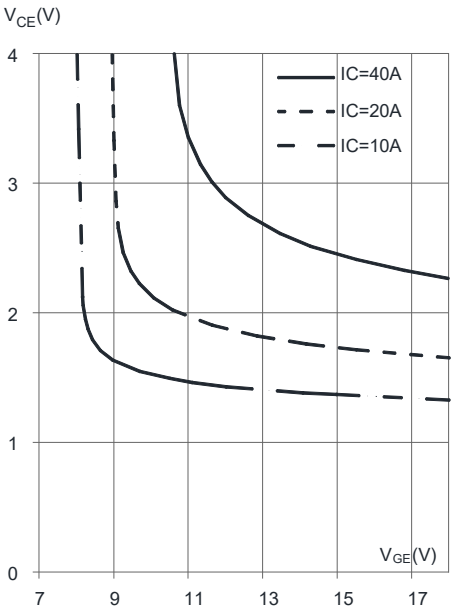


Fig. 8 Typical VCE as a function of VGE

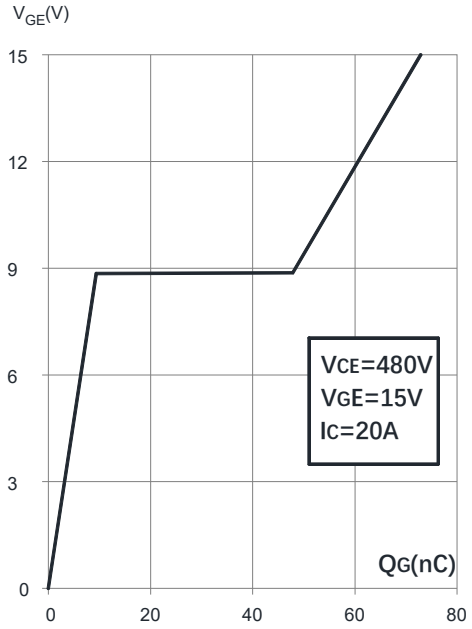


Fig. 5 Typical gate charge

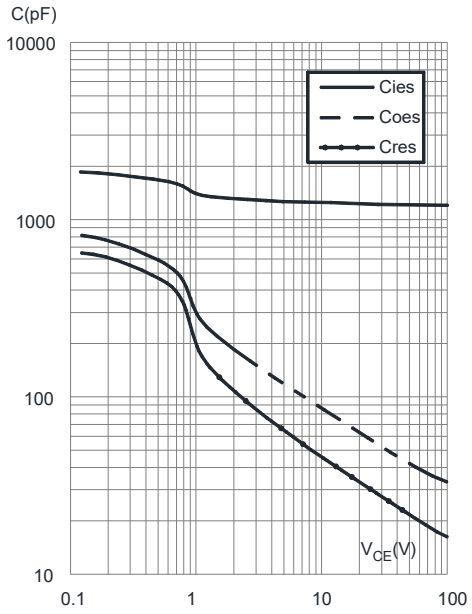


Fig. 6 Capacitance as a function of Vce

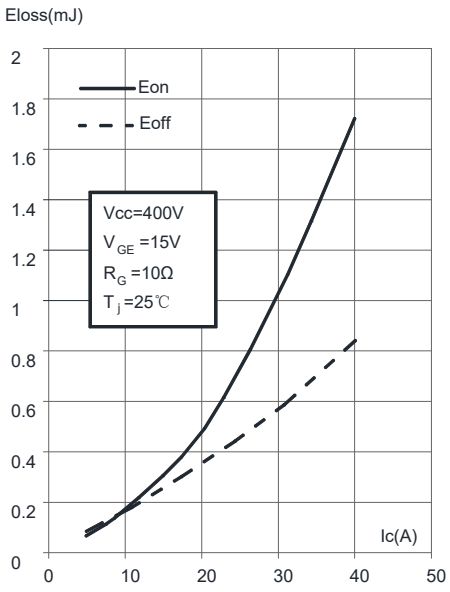


Fig. 7 Typical switching losses as Ic

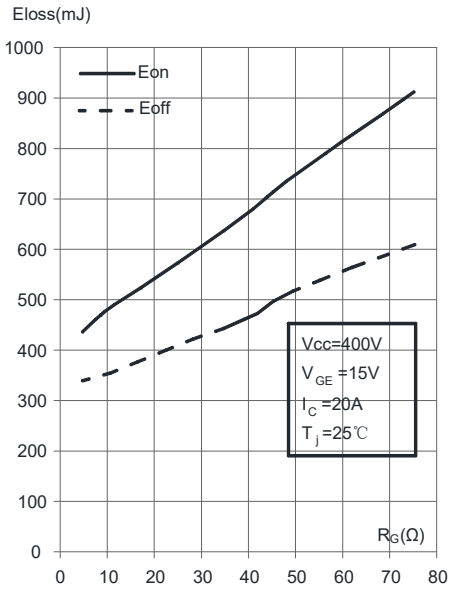


Fig. 8 Typical switching losses as RG

● PART NO. SYSTEM :