Advanced Power Electronics Corp.

AP20GT60I-HF-3

N-Channel Insulated Gate Bipolar Power Transistor

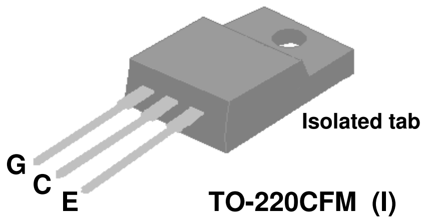
High Speed Switching

Low Saturation Voltage

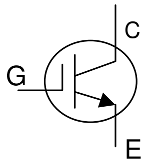
Typical $V_{CE(sat)}$ = 1.8V at I_C=20A

Industry-standard isolated package

RoHS-compliant, halogen-free



V_{CES}	600V
I_C	20A



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{CES}	Collector-Emitter Voltage	600	V
V_{GE}	Gate-Emitter Voltage	±20	V
I_C at T_C=25°C	Collector Current	40	A
I_C at T_C=100°C	Collector Current	20	A
I_{CM}	Pulsed Collector Current[1]	160	A
P_D at T_C=25°C	Maximum Power Dissipation	25	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	150	℃

Notes:

1. Pulse width limited by maximum junction temperature.

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Thermal Resistance Junction-Case	5	℃/W
Rthj-a	Thermal Resistance Junction-Ambient	65	℃/W

Electrical Specifications at Tj=25℃ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_{GES}	Gate-to-Emitter Leakage Current	V_{GE}=±20V, V_{CE}=0V	-	-	±100	nA
I_{CES}	Collector-Emitter Leakage Current	V_{CE}=600V, V_{GE}=0V	-	-	25	uA
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	V_{GE}=15V, I_C=20A	-	1.8	2.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	V_{GE}=15V, I_C=35A	-	2	2.7	V
$V_{GE(th)}$	Gate Threshold Voltage	V_{CE}=V_{GE}, I_C=250uA	2	-	6	V
Q_g	Total Gate Charge	I_C=20A V_{CC}=480V V_{GE}=15V	-	100	160	nC
Q_{ge}	Gate-Emitter Charge		-	24	-	nC
Q_{gc}	Gate-Collector Charge		-	40	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{CE}=480V, I_c=20A, V_{GE}=15V, R_G=5Ω , Inductive Load	-	50	-	ns
t_r	Rise Time		-	20	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	135	-	ns
t_f	Fall Time		-	190	380	ns
E_{on}	Turn-On Switching Loss		-	0.3	-	mJ
E_{off}	Turn-Off Switching Loss		-	0.9	-	mJ
C_{ies}	Input Capacitance	V_{GE}=0V V_{CE}=30V f=1.0MHz	-	3400	5440	pF
C_{oes}	Output Capacitance		-	75	-	pF
C_{res}	Reverse Transfer Capacitance		-	50	-	pF

Ordering Information

AP20GT60I-HF-3TB : in RoHS-compliant halogen-free TO-220CFM, shipped in tubes (50pcs/tube)

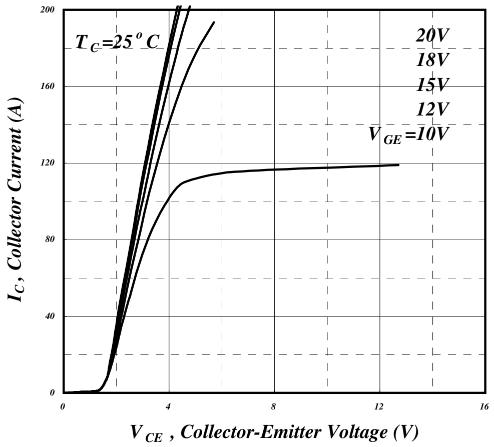


Fig 1. Typical Output Characteristics

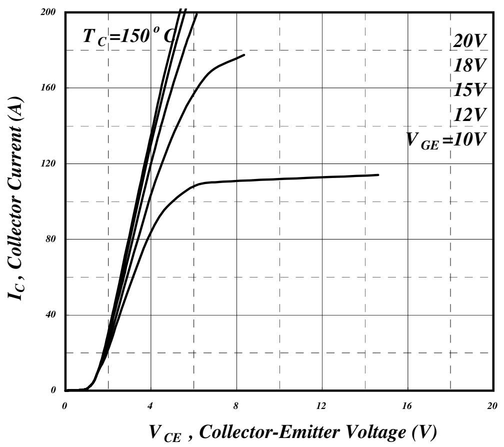


Fig 2. Typical Output Characteristics

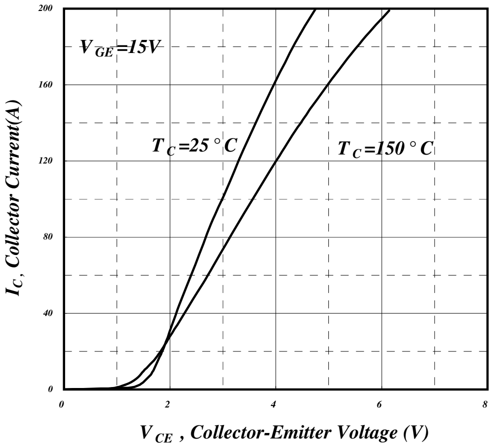


Fig 3. Typical Saturation Voltage
Characteristics

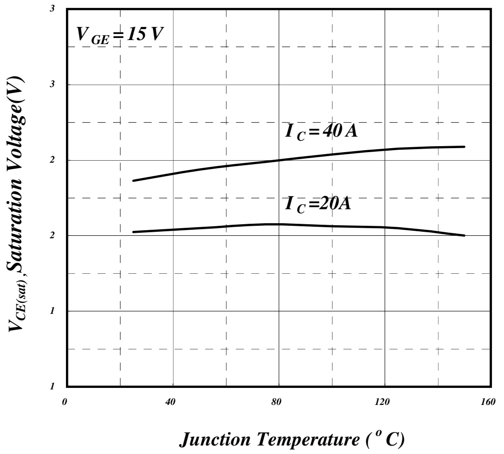


Fig 4. Typical Collector- Emitter Voltage
vs. Junction Temperature

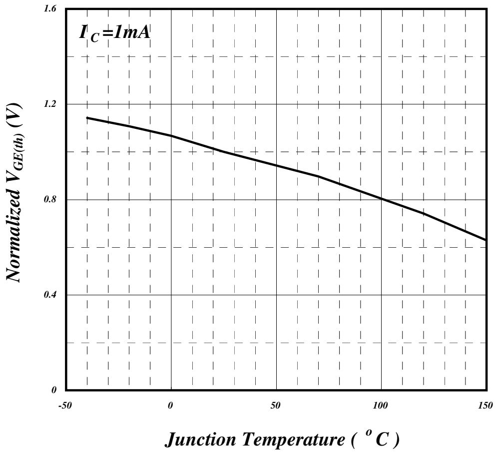


Fig 5. Gate Threshold Voltage
vs. Junction Temperature

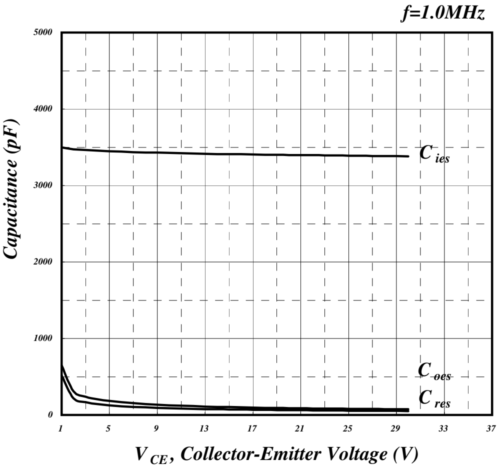


Fig 6. Typical Capacitance Characterisitics

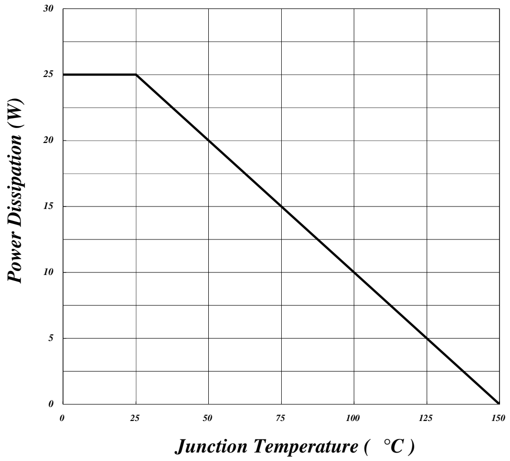


Fig7. Power Dissipation vs. Junction Temperature

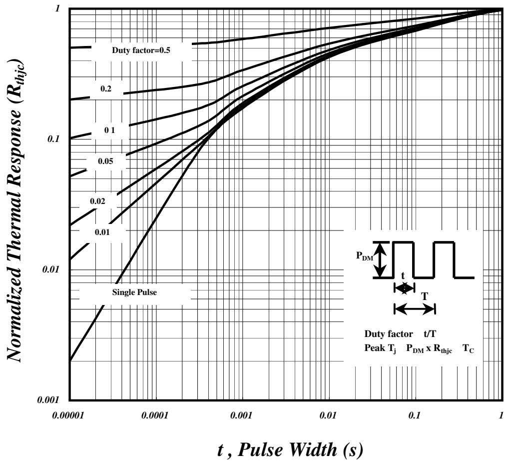


Fig 8. Effective Transient Thermal Impedance

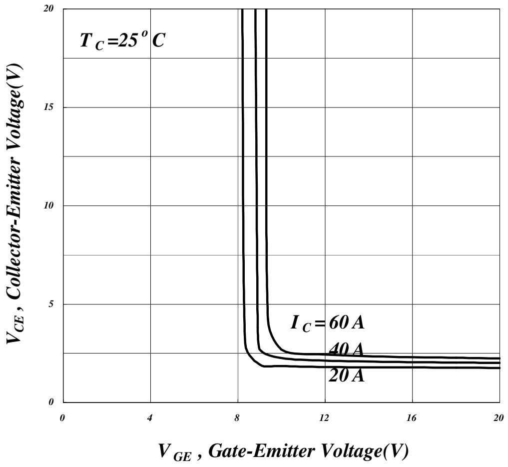


Fig 9. Saturation Voltage vs. V_{GE}

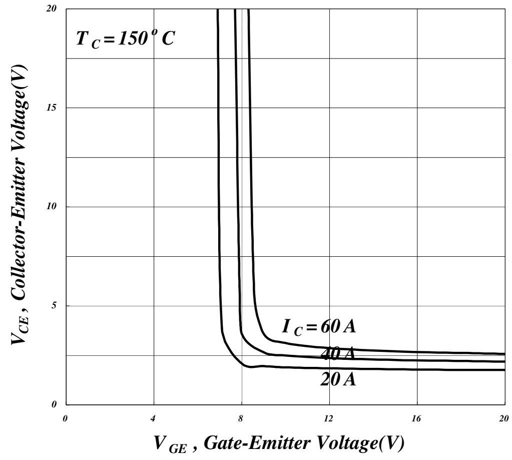


Fig 10. Saturation Voltage vs. V_{GE}

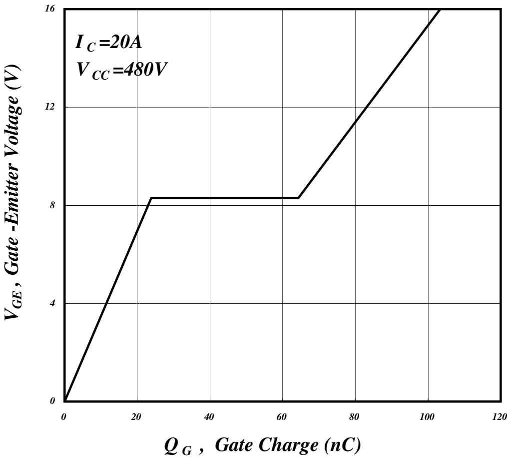


Fig 11. Gate Charge Characterisitics

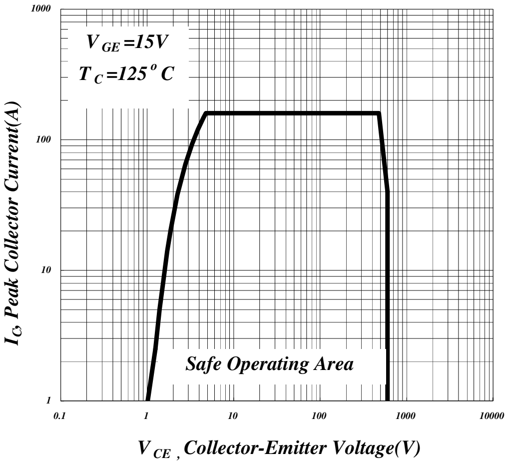
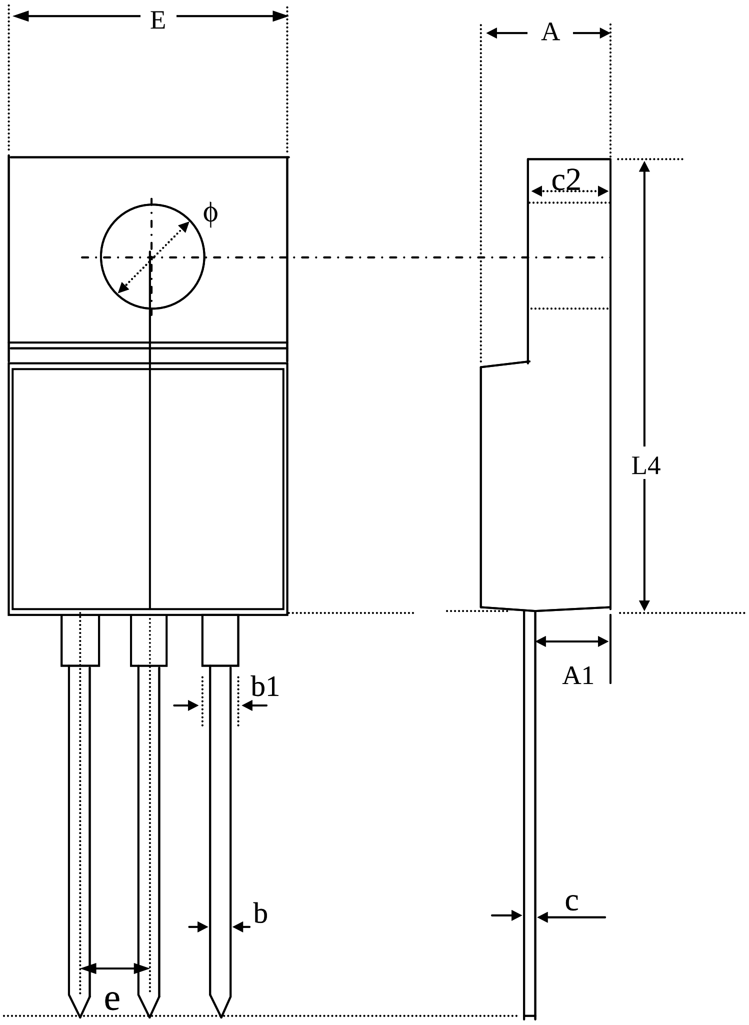


Fig 12. Turn-off SOA

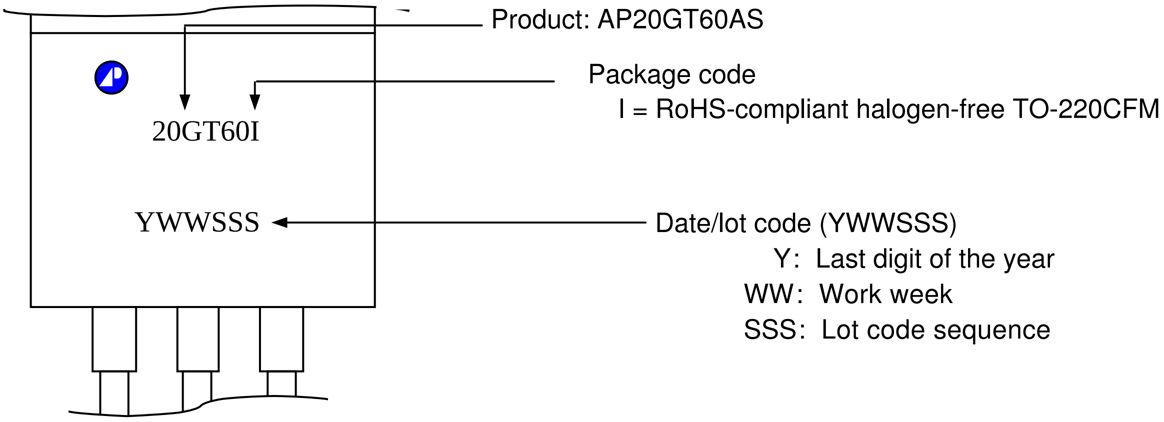
Package Dimensions: TO-220CFM



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.30	4.60	4.90
A1	2.30	2.65	3.00
b	0.50	0.70	0.90
b1	0.95	1.20	1.50
c	0.45	0.65	0.80
c2	2.30	2.60	2.90
E	9.70	10.00	10.40
L4	14.70	15.40	16.10
ϕ	----	3.20	----
e	----	2.54	----

1. All dimensions are in millimeters.
2. Dimensions do not include mold protrusions.

Marking Information:



Product: AP20GT60AS

Package code
I = RoHS-compliant halogen-free TO-220CFM

Date/lot code (YWWSSS)
Y: Last digit of the year
WW: Work week
SSS: Lot code sequence