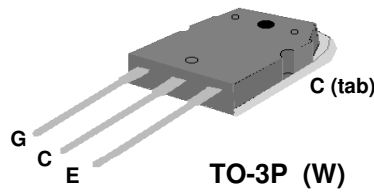


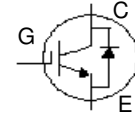


N-Channel Insulated Gate Bipolar Power Transistor

High Speed Switching
Low Saturation Voltage
Typical $V_{CE(sat)} = 1.8V$ at $I_C=20A$
Built-in Fast Recovery Diode
RoHS-compliant, halogen-free



V_{CES}	600V
I_C	20A



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{CES}	Collector-Emmitter Voltage	600	V
V_{GE}	Gate-Emmitter Voltage	± 20	V
I_C at $T_C=25^\circ C$	Collector Current	40	A
I_C at $T_C=100^\circ C$	Collector Current	20	A
I_{CM}	Pulsed Collector Current ¹	160	A
I_{DM}	Collector to Emmitter Diode Forward Current ¹	40	A
P_D at $T_C=25^\circ C$	Maximum Power Dissipation	125	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	150	$^\circ C$
T_L	Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds .	300	$^\circ C$

Notes:

1. Pulse width limited by max. junction temperature .

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Thermal Resistance Junction-Case	1	$^\circ C/W$
Rthj-c(Diode)	Thermal Resistance Junction-Case	1.5	$^\circ C/W$
Rthj-a	Thermal Resistance Junction-Ambient	40	$^\circ C/W$

Electrical Specifications at $T_J=25^\circ C$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_{GES}	Gate-to-Emmitter Leakage Current	$V_{GE}=\pm 20V, V_{CE}=0V$	-	-	± 100	nA
I_{CES}	Collector-Emmitter Leakage Current	$V_{CE}=600V, V_{GE}=0V$	-	-	100	μA
$V_{CE(sat)}$	Collector-Emmitter Saturation Voltage	$V_{GE}=15V, I_C=20A$	-	1.8	2.3	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{CE}=V_{GE}, I_C=250\mu A$	2	-	6	V
Q_g	Total Gate Charge	$I_C=20A$	-	100	160	nC
Q_{ge}	Gate-Emmitter Charge	$V_{CE}=480V$	-	24	-	nC
Q_{gc}	Gate-Collector Charge	$V_{GE}=15V$	-	40	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CE}=480V,$	-	50	-	ns
t_r	Rise Time	$I_C=20A,$	-	20	-	ns
$t_{d(off)}$	Turn-off Delay Time	$V_{GE}=15V,$	-	135	-	ns
t_f	Fall Time	$R_G=5\Omega$	-	190	380	ns
E_{on}	Turn-On Switching Loss	Inductive Load	-	0.3	-	mJ
E_{off}	Turn-Off Switching Loss		-	0.9	-	mJ
C_{ies}	Input Capacitance	$V_{GE}=0V$	-	3400	5440	pF
C_{oes}	Output Capacitance	$V_{CE}=30V$	-	75	-	pF
C_{res}	Reverse Transfer Capacitance	$f=1.0MHz$	-	50	-	pF
V_F	FRD Forward Voltage	$I_F=20A$	-	1.65	2	V
t_{rr}	FRD Reverse Recovery Time	$I_F=10A$	-	50	-	ns
Q_{rr}	FRD Reverse Recovery Charge	$di/dt = 100 A/\mu s$	-	80	-	nC

Ordering Information

AP20GT60SW-HF-3TB : in RoHS-compliant halogen-free TO-3P, shipped in tubes (1440 pcs/carton)

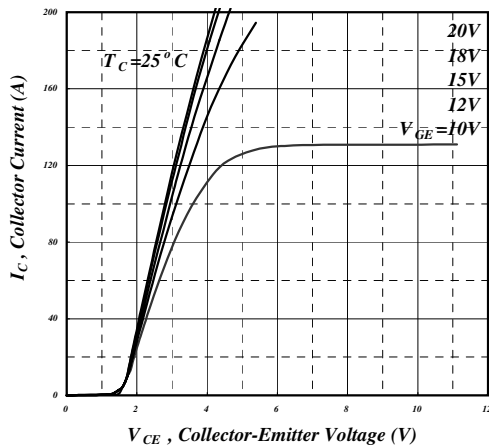


Fig 1. Typical Output Characteristics

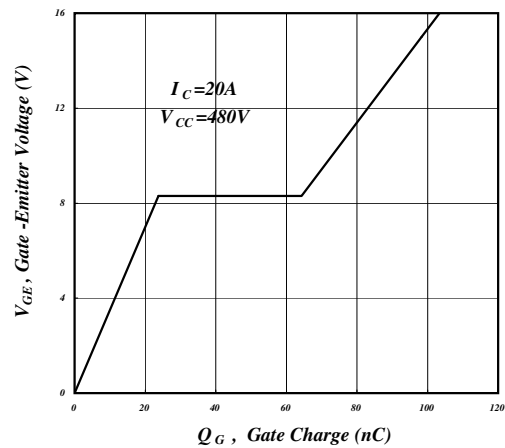


Fig 2. Gate Charge Characteristics

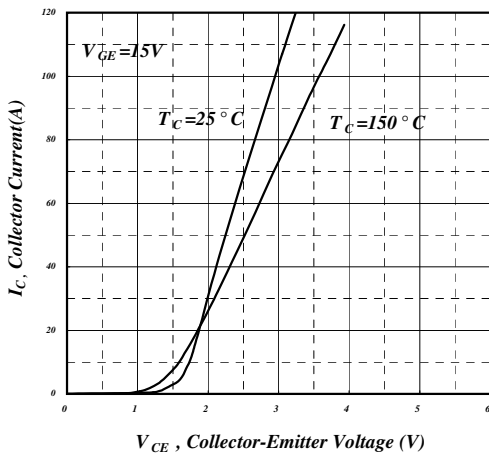


Fig 3. Typical Saturation Voltage Characteristics

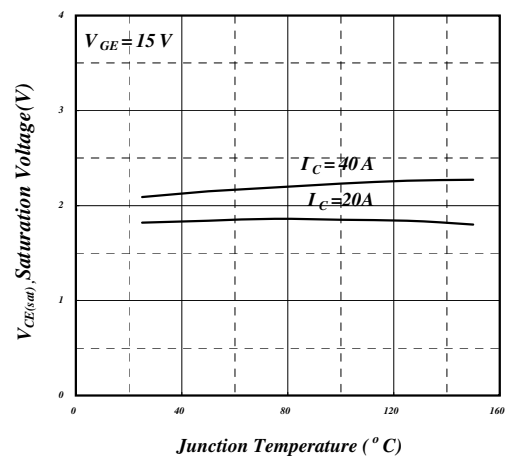


Fig 4. Typical Collector-Emmitter Voltage vs. Junction Temperature

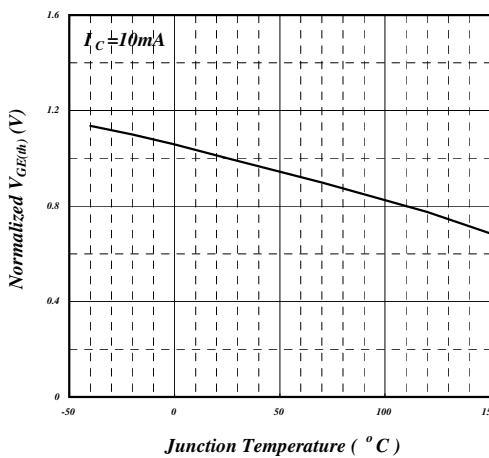


Fig 5. Gate Threshold Voltage vs. Junction Temperature

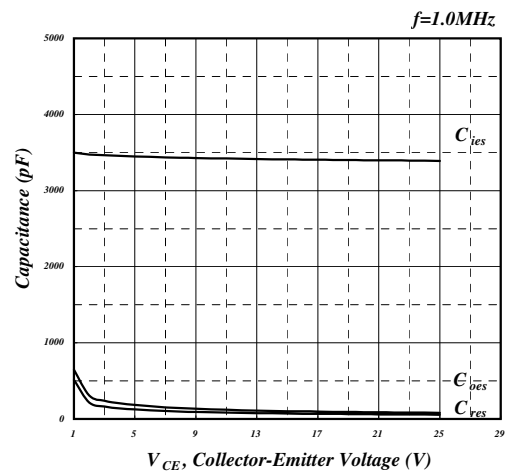


Fig 6. Typical Capacitance Characteristics

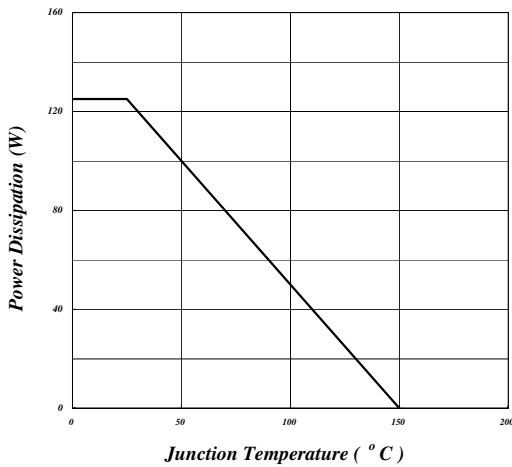


Fig 7. Power Dissipation vs. Junction Temperature

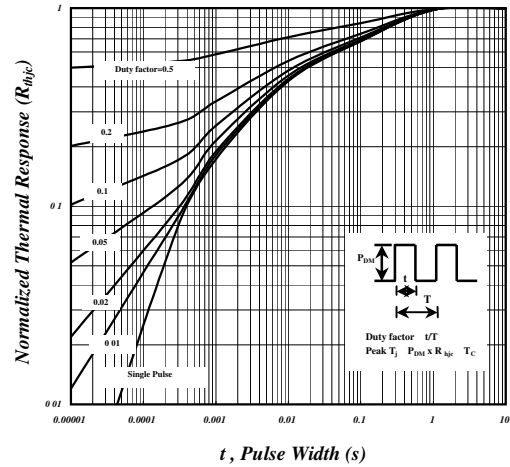


Fig 8. Effective Transient Thermal Impedance

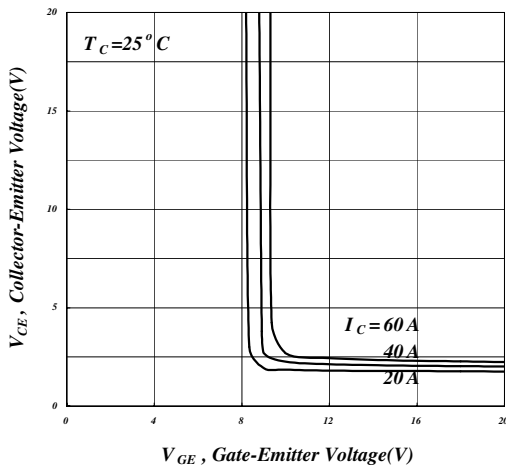


Fig 9. Saturation Voltage vs. V_{GE}

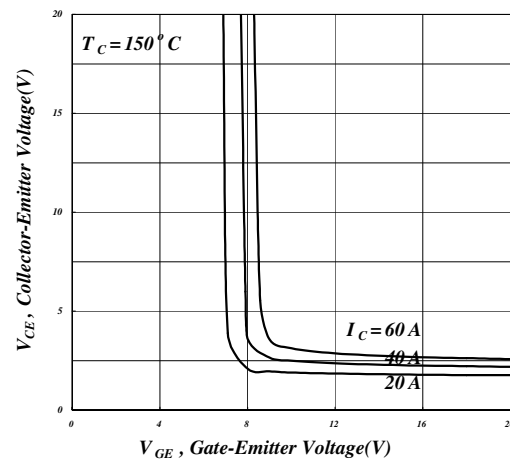


Fig 10. Saturation Voltage vs. V_{GE}

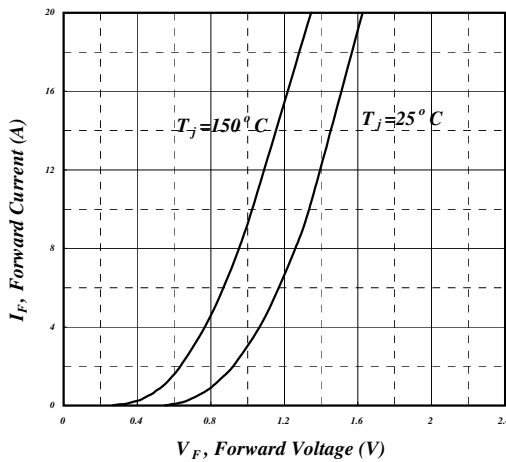


Fig 11. Forward Characteristic of Diode

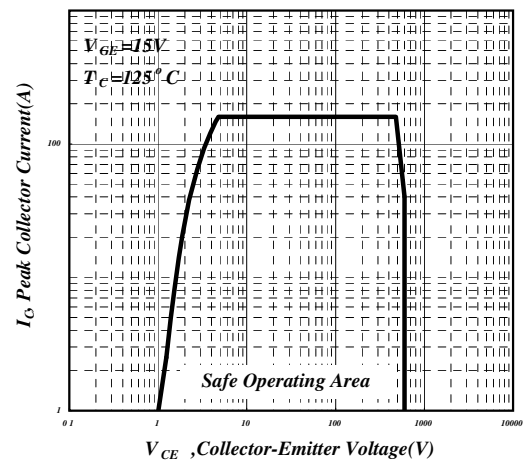
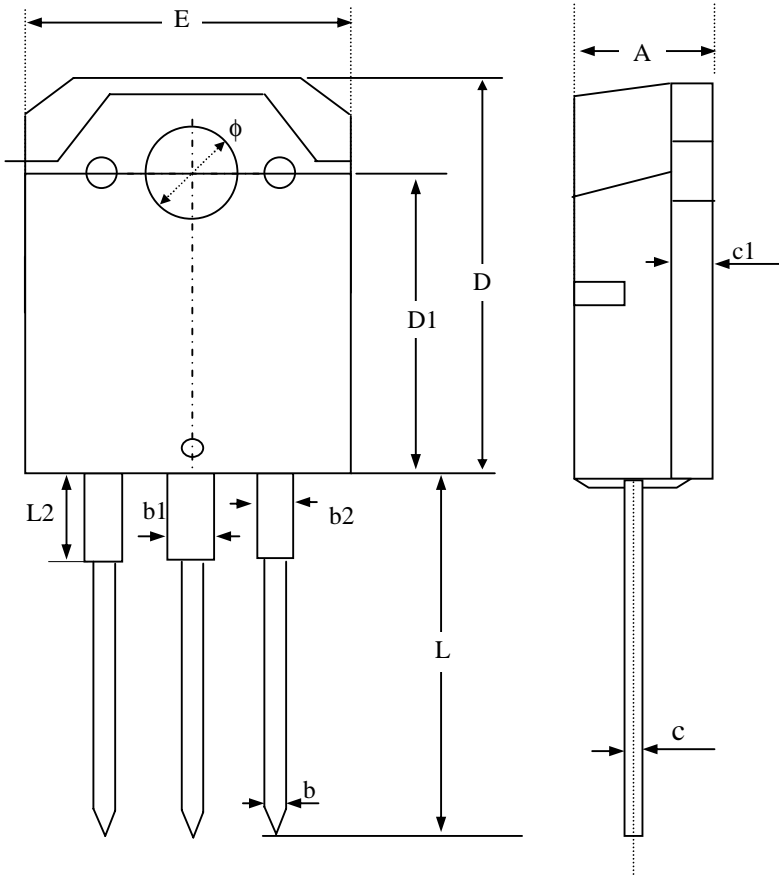


Fig 12. Turn-off SOA

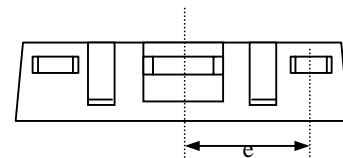


Package Dimensions: TO-3P



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.50	4.80	5.10
b	0.80	1.00	1.30
b1	1.80	2.50	3.20
b2	1.30	--	2.30
c	0.40	0.60	0.90
c1	1.40	--	2.20
D	19.70	20.00	20.30
D1	14.70	15.00	15.30
E	15.30	--	16.10
e	4.45	5.45	6.45
L	17.50	--	20.50
L2	1.00	--	3.70
ϕ	3.00	3.20	3.40

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



Marking Information:

