



N-Channel Insulated Gate Bipolar Power Transistor

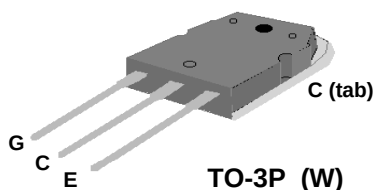
High Speed Switching

Low Saturation Voltage

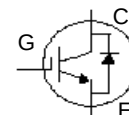
Typical $V_{CE(sat)} = 2.6V$ at $I_C=33A$

Built-in Fast Recovery Diode

RoHS-compliant, halogen-free



V_{CES}	600V
I_C	45A



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{CES}	Collector-Emitter Voltage	600	V
V_{GE}	Gate-Emitter Voltage	± 30	V
I_C at $T_C=25^\circ C$	Collector Current	75	A
I_C at $T_C=100^\circ C$	Collector Current	45	A
I_{CM}	Pulsed Collector Current	150	A
I_F at $T_C=25^\circ C$	Diode Forward Current	40	A
I_F at $T_C=100^\circ C$	Diode Forward Current	15	A
P_D at $T_C=25^\circ C$	Maximum Power Dissipation	300	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	150	$^\circ C$
T_L	Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 5 seconds .	300	$^\circ C$

Notes:

1. Pulse width limited by maximum junction temperature.

Thermal Data

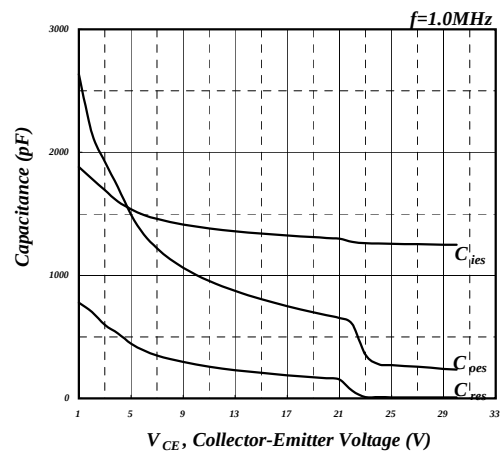
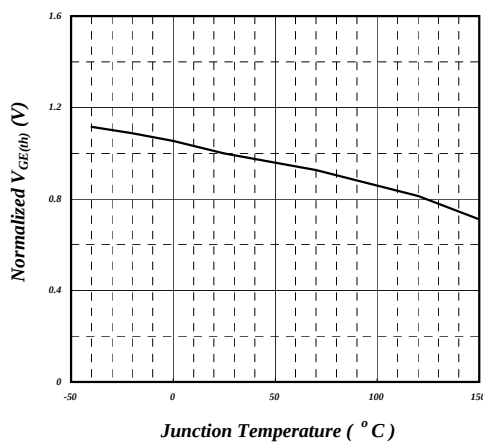
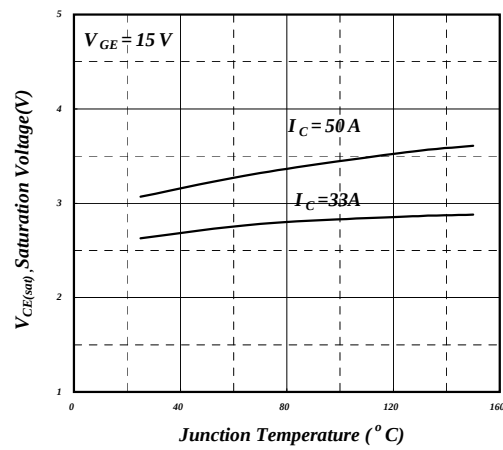
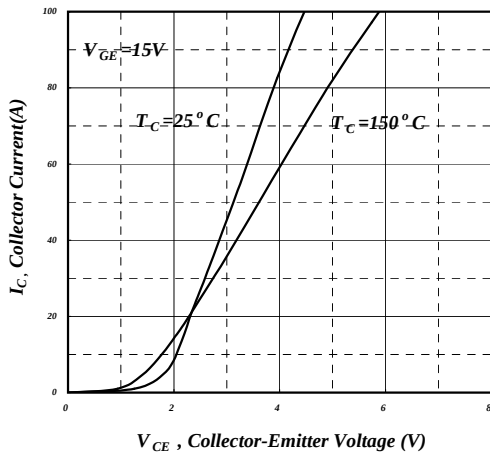
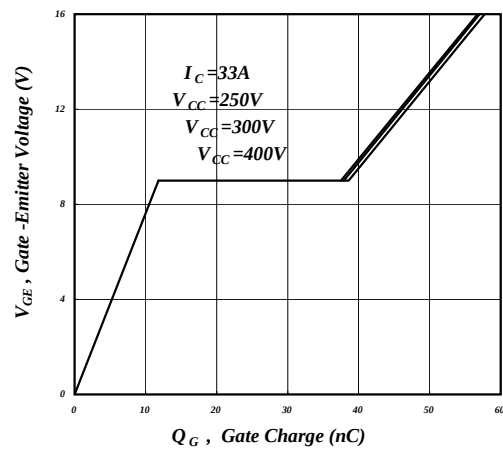
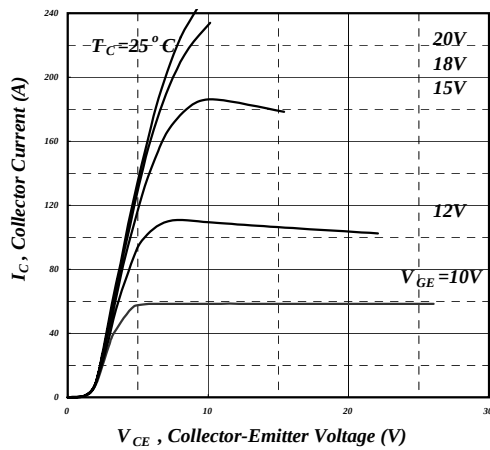
Symbol	Parameter	Value	Units
Rthj-c	Thermal Resistance Junction-Case	0.42	$^\circ C/W$
Rthj-c(Diode)	Thermal Resistance Junction-Case	1.5	$^\circ C/W$
Rthj-a	Thermal Resistance Junction-Ambient	40	$^\circ C/W$

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_{GES}	Gate-to-Emitter Leakage Current	$V_{GE}=\pm 30V, V_{CE}=0V$	-	-	± 100	nA
I_{CES}	Collector-Emitter Leakage Current	$V_{CE}=600V, V_{GE}=0V$	-	-	500	μA
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=33A$	-	2.6	3	V
		$V_{GE}=15V, I_C=50A$	-	3.1	3.5	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{CE}=V_{GE}, I_C=250\mu A$	2	-	6	V
Q_g	Total Gate Charge	$I_C=33A$	-	55	100	nC
Q_{ge}	Gate-Emitter Charge	$V_{CE}=400V$	-	12	-	nC
Q_{gc}	Gate-Collector Charge	$V_{GE}=15V$	-	27	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CE}=390V, I_C=33A, V_{GE}=15V, R_G=5\Omega$	-	27	-	ns
t_r	Rise Time		-	22	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	110	-	ns
t_f	Fall Time		-	100	260	ns
E_{on}	Turn-On Switching Loss	Inductive Load	-	0.7	-	mJ
E_{off}	Turn-Off Switching Loss		-	1.2	-	mJ
C_{ies}	Input Capacitance	$V_{GE}=0V$	-	1250	2000	pF
C_{oes}	Output Capacitance	$V_{CE}=30V$	-	235	-	pF
C_{res}	Reverse Transfer Capacitance	$f=1.0MHz$	-	7	-	pF
V_F	FRD Forward Voltage	$I_F=15A$	-	1.3	1.7	V
t_{rr}	FRD Reverse Recovery Time	$I_F=15A$	-	65	-	ns
Q_{rr}	FRD Reverse Recovery Charge	$di/dt = 200 A/\mu s$	-	230	-	nC

Ordering Information

AP50G60SW-HF-3TB : in RoHS-compliant halogen-free TO-3P, shipped in tubes (1440 pcs/carton)



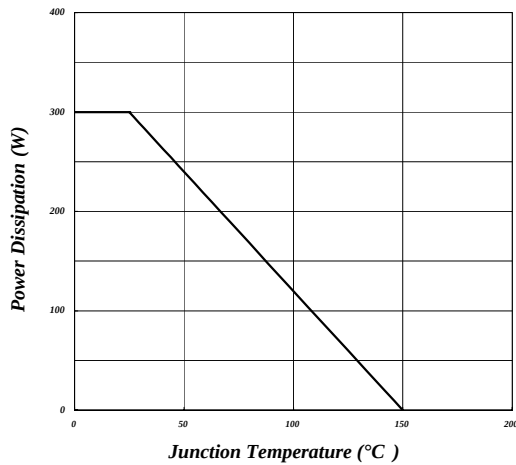


Fig 7. Power Dissipation vs. Junction Temperature

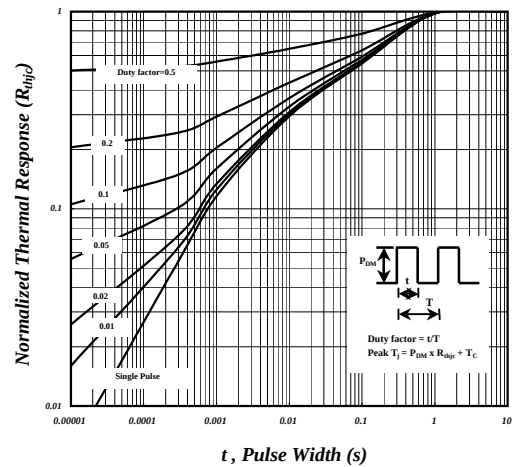


Fig 8. Effective Transient Thermal Impedance

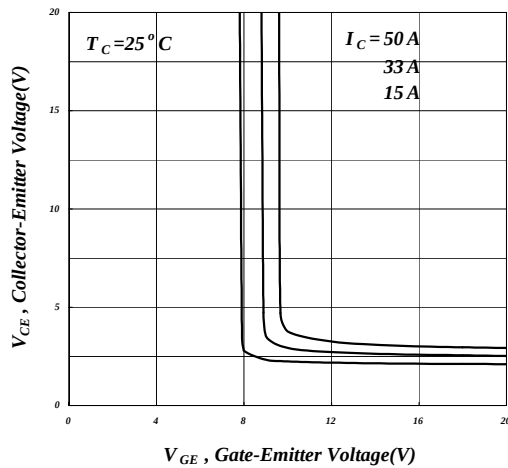


Fig 9. Saturation Voltage vs. V_{GE}

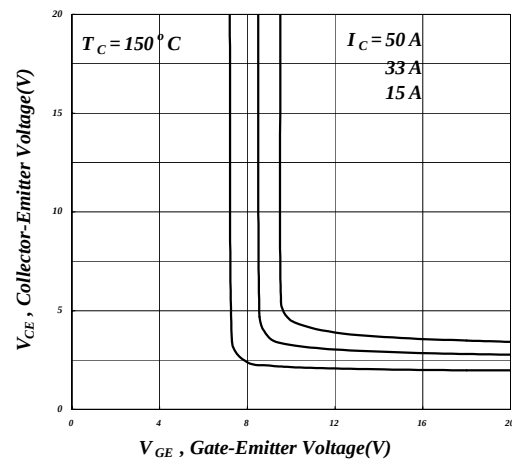


Fig 10. Saturation Voltage vs. V_{GE}

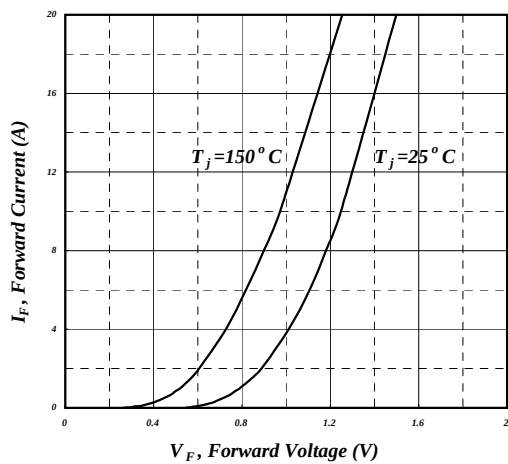


Fig 11. Forward Characteristic of Diode

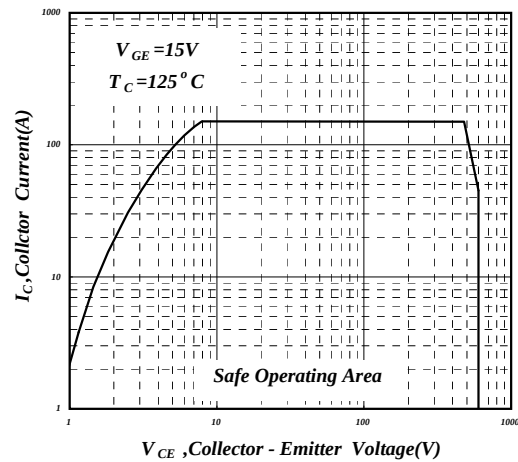
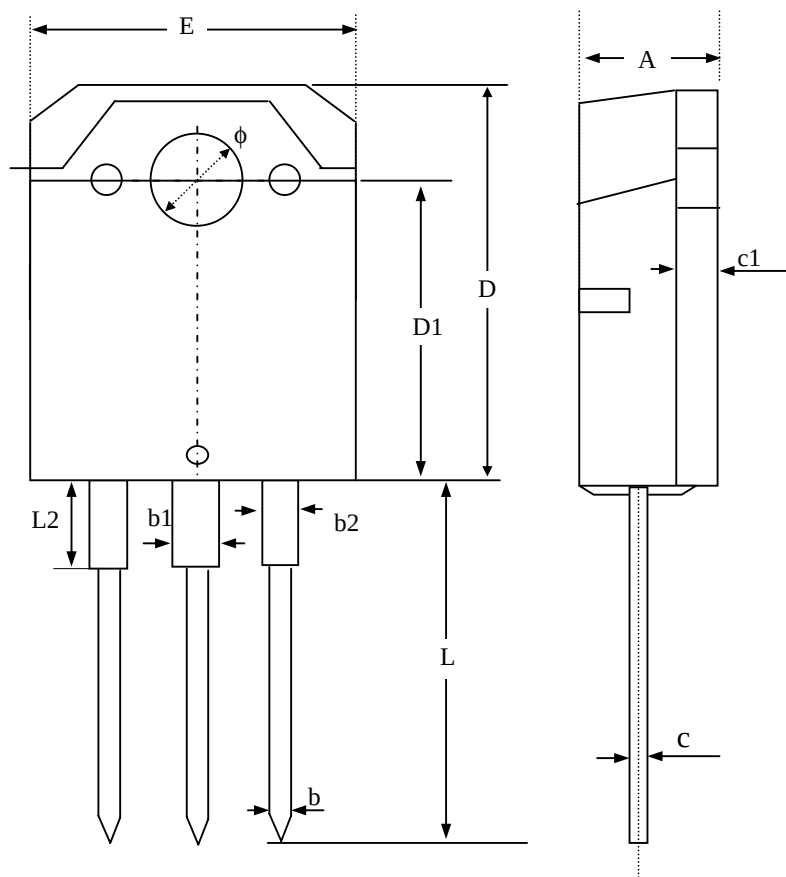


Fig 12. Turn-off SOA

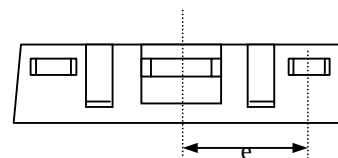


Package Dimensions: TO-3P



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:

