N-Channel Insulated Gate Bipolar Power Transistor

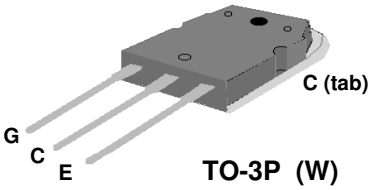
High Speed Switching

Low Saturation Voltage

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

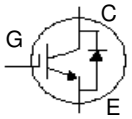
Built-in Fast Recovery Diode

RoHS-compliant, halogen-free



TO-3P (W)

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℃	Collector Current	75	A
I_C at T_C=100℃	Collector Current	45	A
I_{CM}	Pulsed Collector Current	150	A
I_F at T_C=25℃	Diode Forward Current	40	A
I_F at T_C=100℃	Diode Forward Current	15	A
P_D at T_C=25℃	Maximum Power Dissipation	300	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	150	℃
T_L	Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 5 seconds .	300	℃

Notes:

1. Pulse width limited by maximum junction temperature.

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Thermal Resistance Junction-Case	0.42	℃/W
Rthj-c(Diode)	Thermal Resistance Junction-Case	1.5	℃/W
Rthj-a	Thermal Resistance Junction-Ambient	40	℃/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_{GES}	Gate-to-Emitter Leakage Current	V_{GE}=±30V, V_{CE}=0V	-	-	±100	nA
I_{CES}	Collector-Emitter Leakage Current	V_{CE}=600V, V_{GE}=0V	-	-	500	uA
$V_{CE(sat)}$	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=250uA	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,	-	27	-	ns
t_r	Rise Time	I_c=33A,	-	22	-	ns
$t_{d(off)}$	Turn-off Delay Time	V_{GE}=15V,	-	110	-	ns
t_f	Fall Time	R_G=5Ω,	-	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/μs	-	230	-	nC

Ordering Information

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

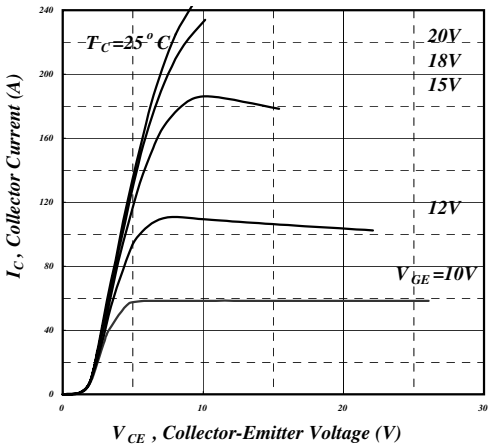


Fig 1. Typical Output Characteristics

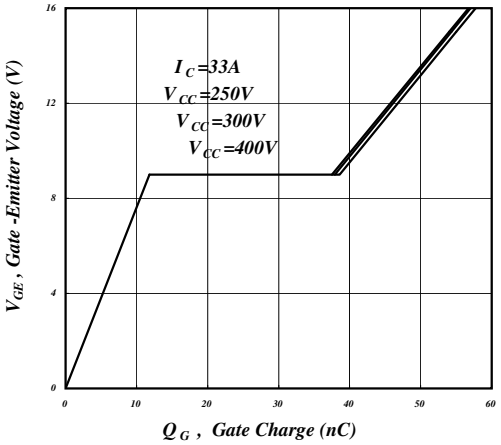


Fig 2. Gate Charge Characterisitics

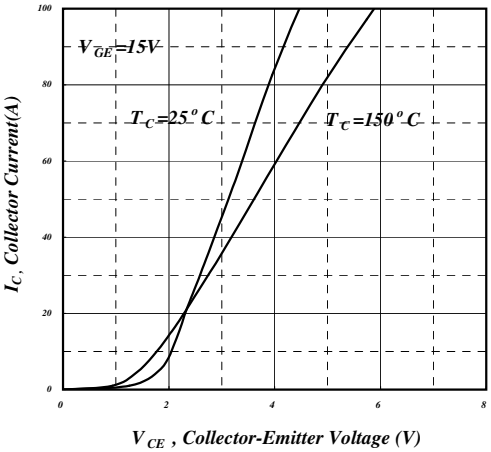


Fig 3. Typical Saturation Voltage Characteristics

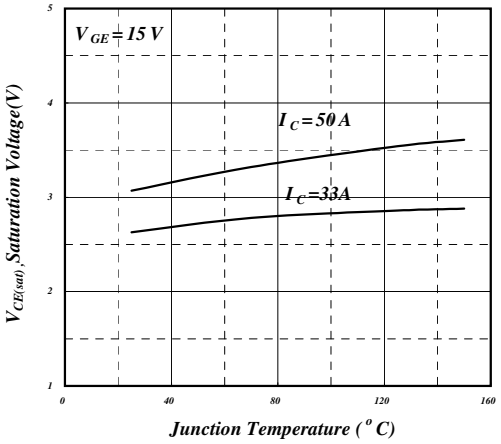


Fig 4. Typical Collector- Emitter Voltage vs. Junction Temperature

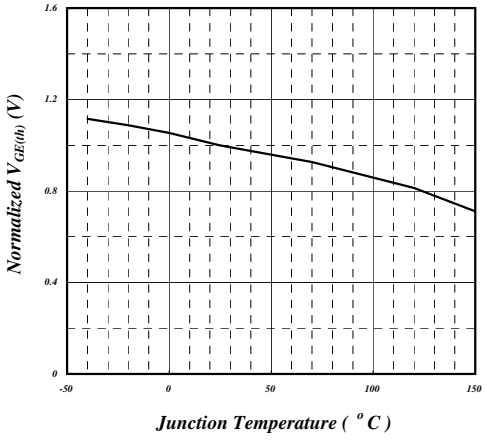


Fig 5. Gate Threshold Voltage vs. Junction Temperature

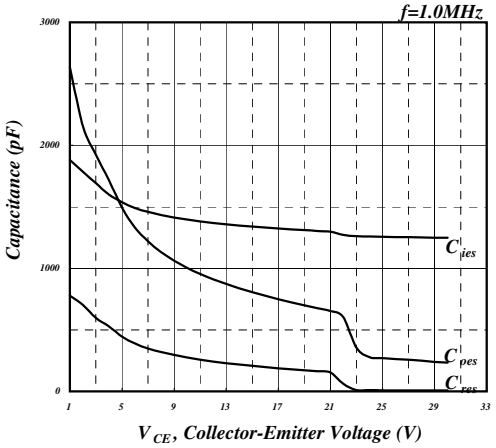


Fig 6. Typical Capacitance Characterisitics

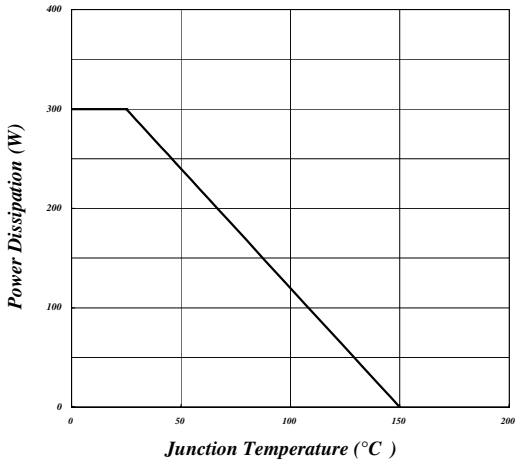


Fig7. Power Dissipation vs. Junction Temperature

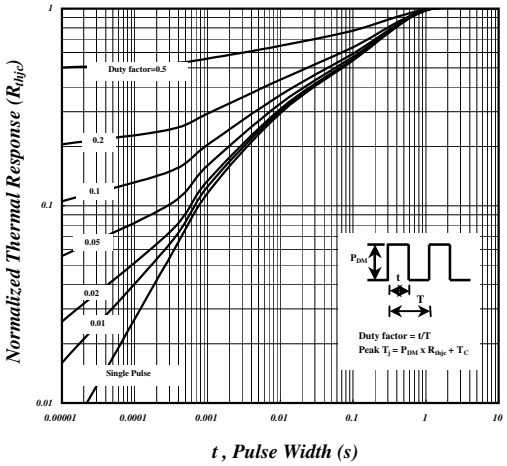


Fig 8. Effective Transient Thermal Impedance

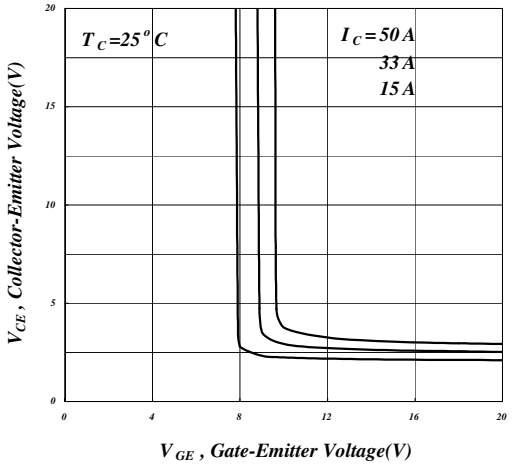


Fig 9. Saturation Voltage vs. V_{GE}

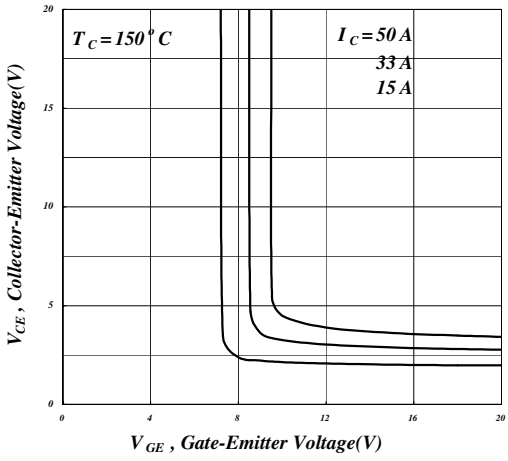


Fig 10. Saturation Voltage vs. V_{GE}

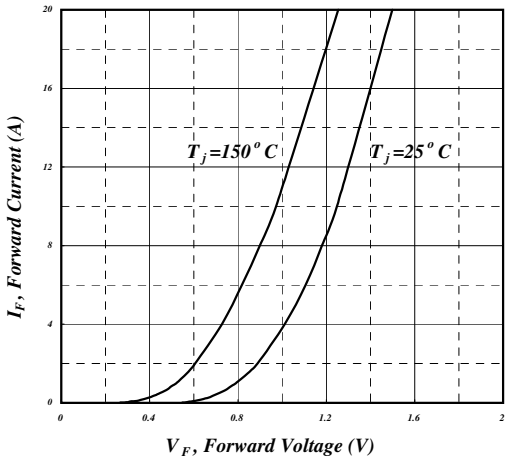


Fig 11. Forward Characteristic of Diode

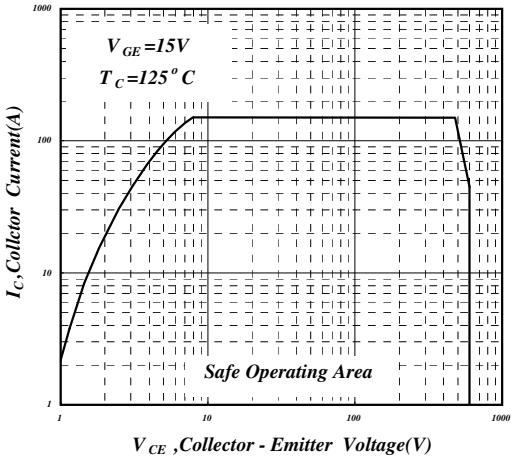
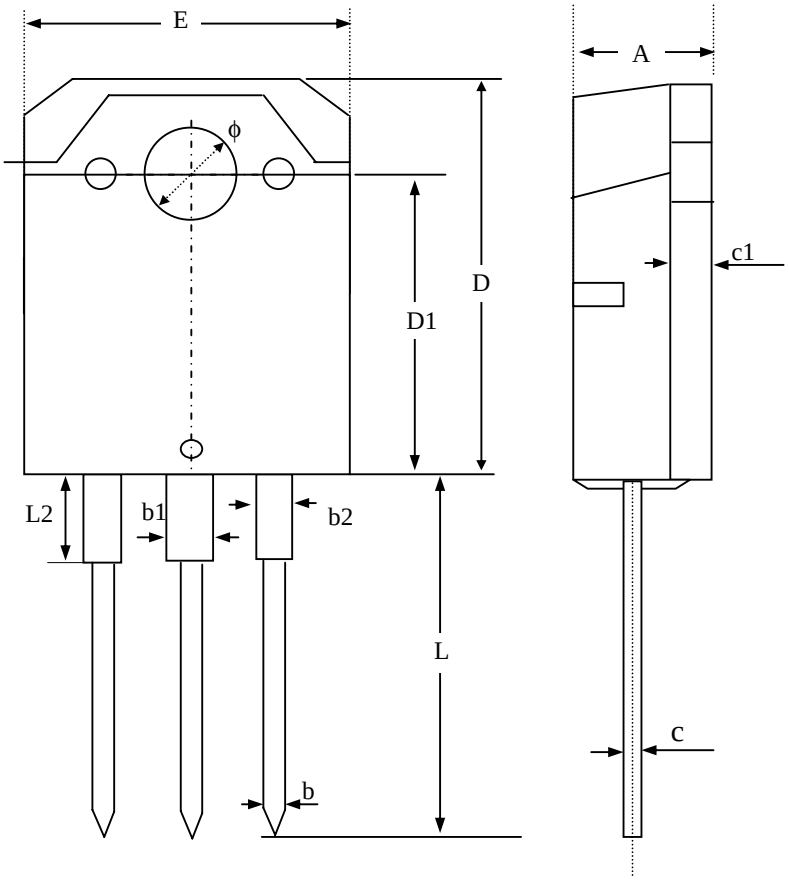


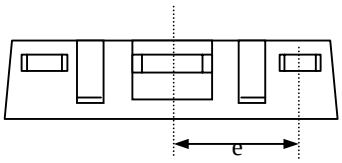
Fig 12. Turn-off SOA

Package Dimensions: TO-3P

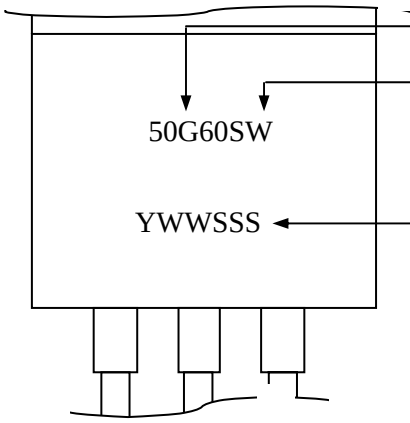


SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.50	4.80	5.10
b	0.80	1.00	1.30
b1	1.80	2.50	3.20
b2	1.30	--	2.30
c	0.40	0.60	0.90
c1	1.40	--	2.20
D	19.70	20.00	20.30
D1	14.70	15.00	15.30
E	15.30	--	16.10
e	4.45	5.45	6.45
L	17.50	--	20.50
L2	1.00	--	3.70
ϕ	3.00	3.20	3.40

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



Marking Information:



Product: AP50G60SW

Package code
SW = RoHS-compliant, halogen free TO-3P
with co-packed fast recovery diode

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