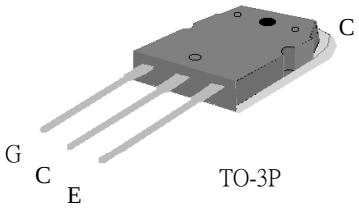
Advanced Power Electronics Corp.

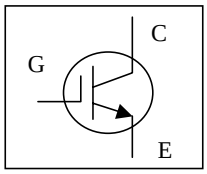
N-CHANNEL INSULATED GATE BIPOLAR TRANSISTOR

Features

- ▼ High Speed Switching
- ▼ Low Saturation Voltage
  $V_{CE(sat),Typ.}$=2.5V@I_C=40A
- ▼ RoHS Compliant & Halogen-Free



V_{CES}	600V
I_C	40A



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{CES}	Collector-Emitter Voltage	600	V
V_{GE}	Gate-Emitter Voltage	±30	V
I_C@T_C=25°C	Collector Current	75	A
I_C@T_C=100°C	Collector Current	40	A
I_{CM}	Pulsed Collector Current	150	A
P_D@T_C=25°C	Maximum Power Dissipation	277	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	150	°C
T_L	Maximum Lead Temp. for Soldering Purposes , 1/8" from case for 5 seconds .	300	°C

Notes:

1.Pulse width limited by max. junction temperature .

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Thermal Resistance Junction-Case	0.45	°C/W
Rthj-a	Thermal Resistance Junction-Ambient	40	°C/W

Electrical Characteristics@T_j=25°C(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=40A	-	2.5	2.9	V
		V_{GE}=15V, I_C=75A	-	3.3	-	V
$V_{GE(th)}$	Gate Threshold Voltage	V_{CE}=V_{GE}, I_C=1mA	3	-	7	V
Q_g	Total Gate Charge	I_C=33A	-	66	105	nC
Q_{ge}	Gate-Emitter Charge	V_{CE}=400V	-	12	-	nC
Q_{gc}	Gate-Collector Charge	V_{GE}=15V	-	36	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{CE}=390V,	-	15	-	ns
t_r	Rise Time	I_c=33A,	-	80	-	ns
$t_{d(off)}$	Turn-off Delay Time	V_{GE}=15V,	-	43	-	ns
t_f	Fall Time	R_G=5Ω, Inductive Load	-	160	320	ns
E_{on}	Turn-On Switching Loss		-	1.5	-	mJ
E_{off}	Turn-Off Switching Loss		-	0.75	-	mJ
C_{ies}	Input Capacitance	V_{GE}=0V	-	1400	2240	pF
C_{oes}	Output Capacitance	V_{CE}=30V	-	160	-	pF
C_{res}	Reverse Transfer Capacitance	f=1.0MHz	-	20	-	pF

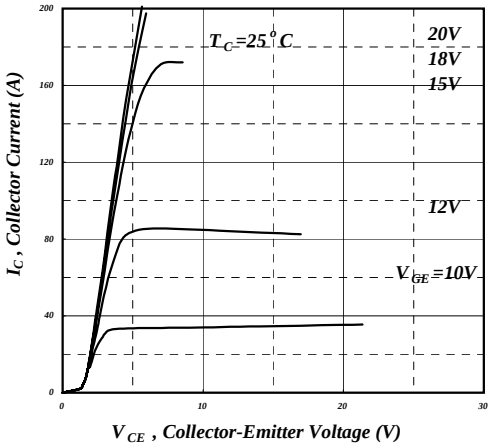


Fig 1. Typical Output Characteristics

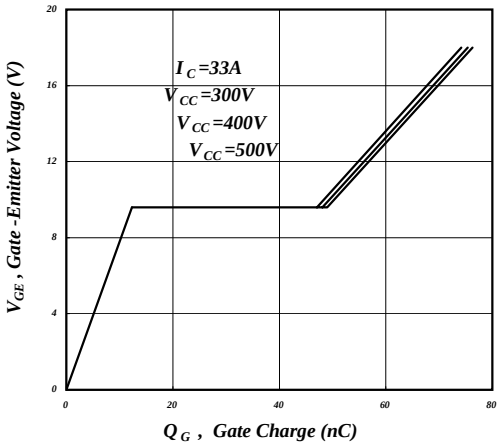


Fig 2. Gate Charge Characterisitics

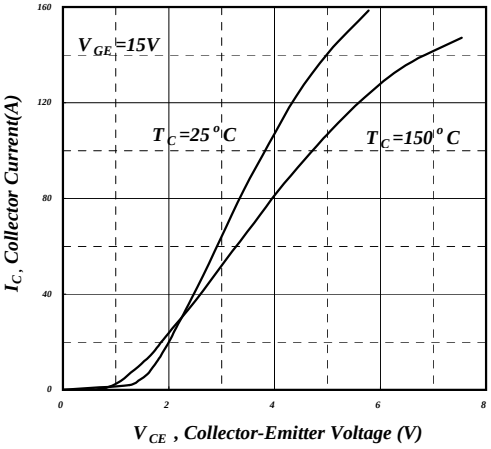


Fig 3. Typical Saturation Voltage Characteristics

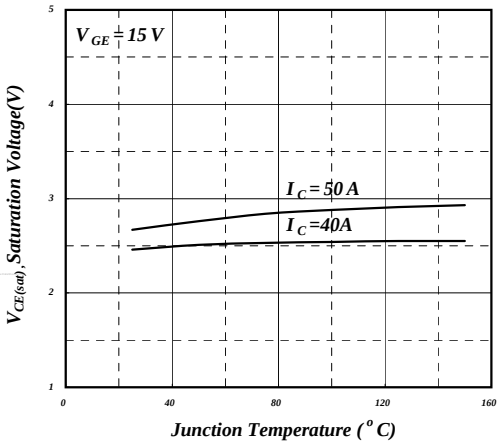


Fig 4. Typical Collector- Emitter Voltage v.s. Junction Temperature

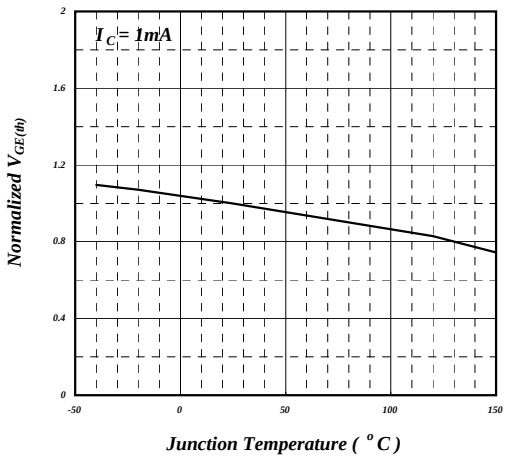


Fig 5. Gate Threshold Voltage v.s. Junction Temperature

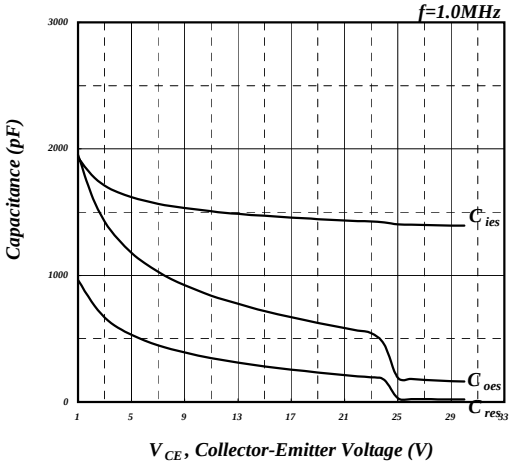


Fig 6. Typical Capacitance Characterisitics

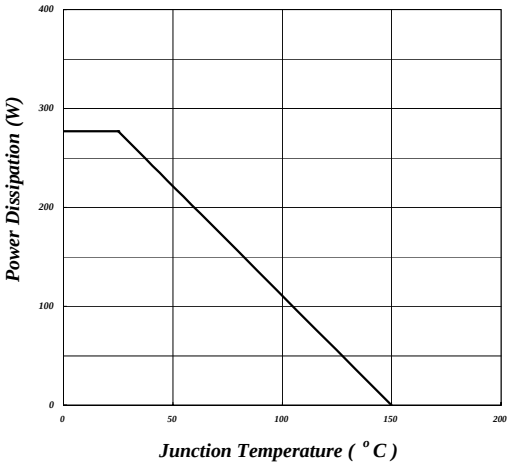


Fig 7. Power Dissipation vs. Junction Temperature

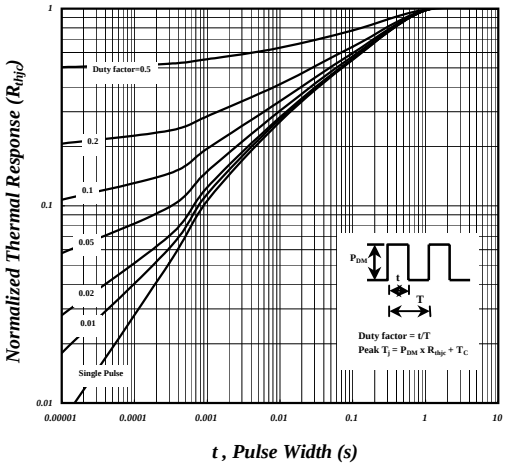


Fig 8. Effective Transient Thermal Impedance, Junction-to-Case (IGBT)

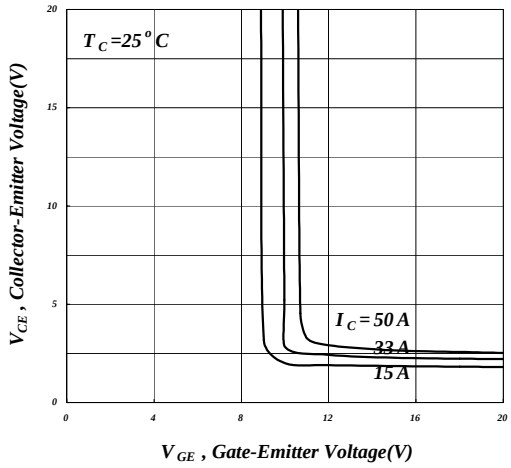


Fig 9. Saturation Voltage vs. V_{GE}

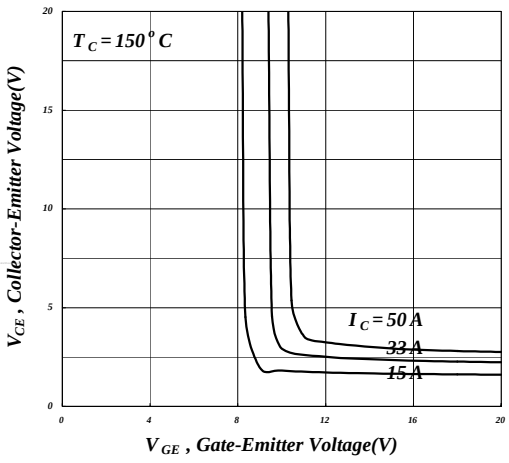


Fig 10. Saturation Voltage vs. V_{GE}

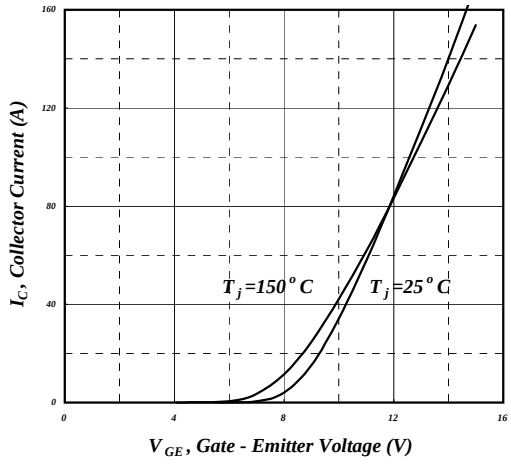


Fig 11. Transfer Characteristics

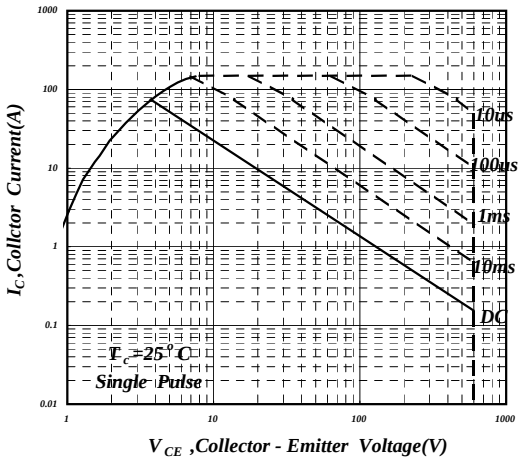


Fig 12. SOA Characteristics