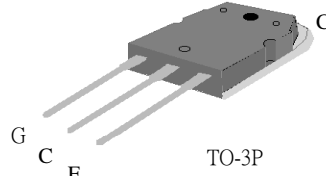


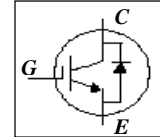


Features

- ▼ High Speed Switching
- ▼ Low Saturation Voltage
 $V_{CE(sat), Typ.} = 1.85V @ I_C = 45A$
- ▼ 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
$I_C @ T_C = 25^\circ C$	Collector Current	90	A
$I_C @ T_C = 100^\circ C$	Collector Current	45	A
I_{CM}	Pulsed Collector Current	180	A
$I_F @ T_C = 100^\circ C$	Diode Forward Current	20	A
$P_D @ T_C = 25^\circ C$	Maximum Power Dissipation	250	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	0.5	$^\circ C/W$
Rthj-c(Diode)	Thermal Resistance Junction-Case	1.2	$^\circ C/W$
Rthj-a	Thermal Resistance Junction-Ambient	40	$^\circ C/W$

Electrical Characteristics @ $T_J = 25^\circ C$ (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	$V_{CE} = 600V, V_{GE} = 0V$	-	-	1	mA
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE} = 15V, I_C = 45A$	-	1.85	2.4	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{GE}, I_C = 250\mu A$	2.5	-	7.5	V
Q_g	Total Gate Charge	$I_C = 45A$	-	118	188	nC
Q_{ge}	Gate-Emitter Charge	$V_{CE} = 400V$	-	30	-	nC
Q_{gc}	Gate-Collector Charge	$V_{GE} = 15V$	-	64	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CE} = 300V, I_C = 45A,$	-	60	-	ns
t_r	Rise Time	$V_{GE} = 15V,$	-	50	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G = 5 \Omega,$	-	140	-	ns
t_f	Fall Time	Inductive Load	-	180	360	ns
E_{on}	Turn-On Switching Loss		-	0.8	-	mJ
E_{off}	Turn-Off Switching Loss		-	1.4	-	mJ
C_{ies}	Input Capacitance	$V_{GE} = 0V$	-	3200	5120	pF
C_{oes}	Output Capacitance	$V_{CE} = 30V$	-	240	-	pF
C_{res}	Reverse Transfer Capacitance	$f = 1.0MHz$	-	75	-	pF

Electrical Characteristics of Diode @ $T_J = 25^\circ C$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_F	FRD Forward Voltage	$I_F = 15A$	-	1.5	2	V
V_F	FRD Forward Voltage	$I_F = 30A$	-	1.8	2.4	V
t_{rr}	FRD Reverse Recovery Time	$I_F = 20A$	-	45	-	ns
Q_{rr}	FRD Reverse Recovery Charge	$di/dt = 100 A/\mu s$	-	75	-	nC

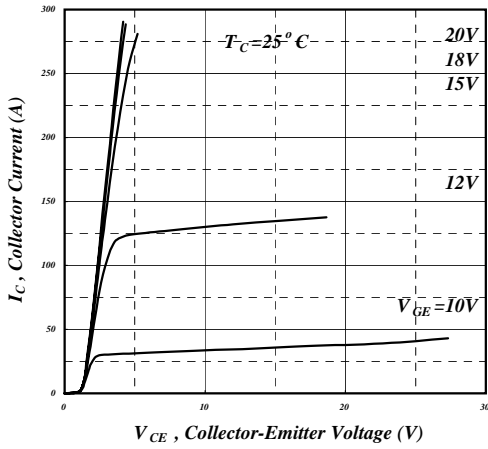


Fig 1. Typical Output Characteristics

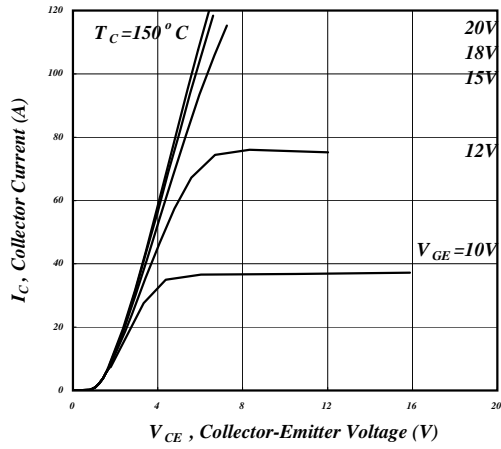


Fig 2. Typical Output Characteristics

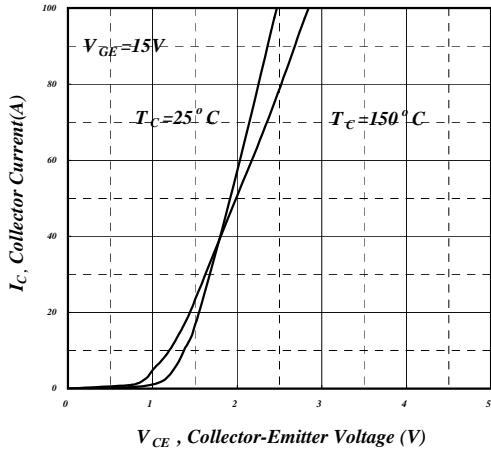


Fig 3. Typical Saturation Voltage Characteristics

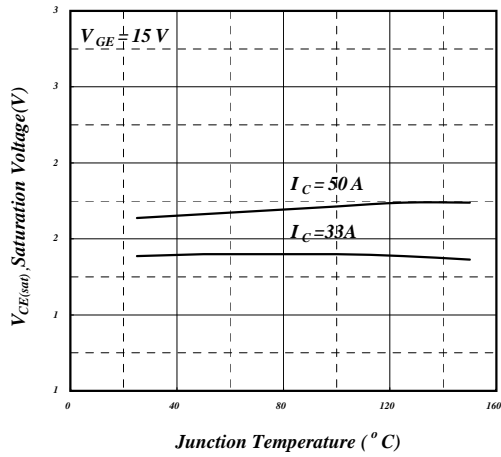


Fig 4. Typical Collector- Emitter Voltage v.s. Junction Temperature

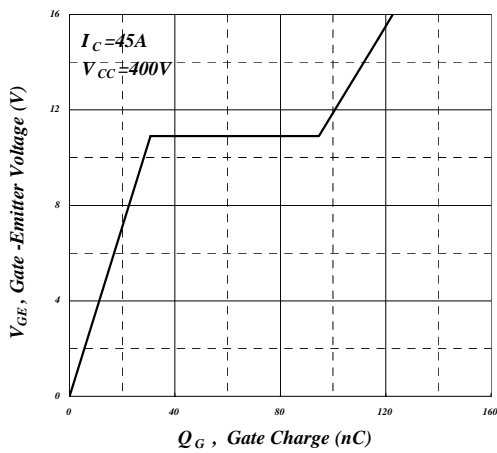


Fig 5. Gate Charge Characteristics

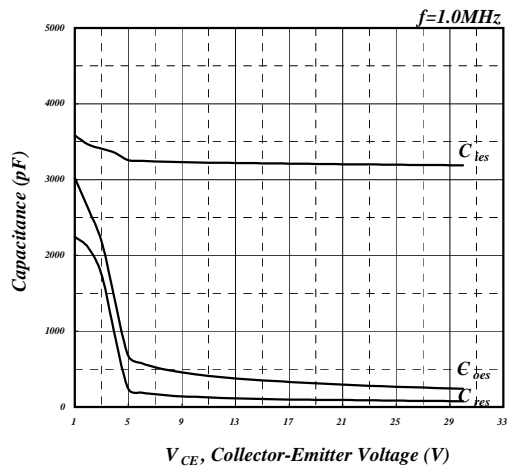


Fig 6. Typical Capacitance Characteristics

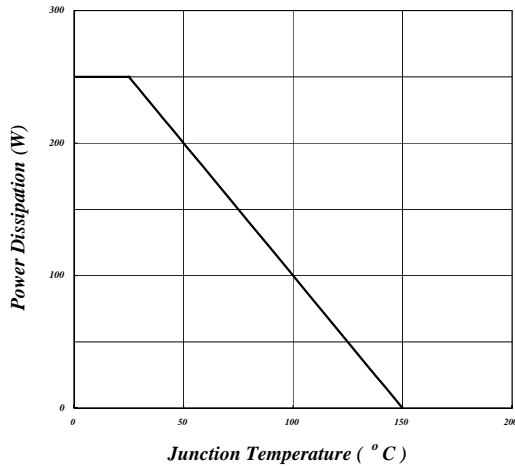


Fig 7. Power Dissipation vs. Junction Temperature

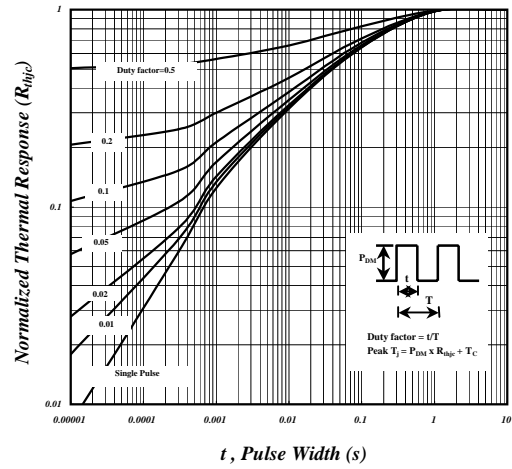


Fig 8. Effective Transient Thermal Impedance, Junction-to-Case (IGBT)

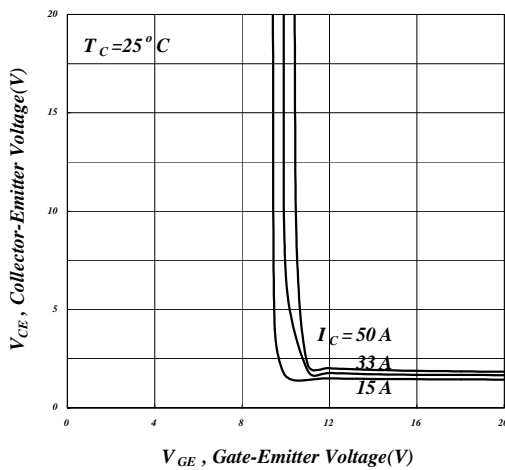


Fig 9. Saturation Voltage vs. V_GE

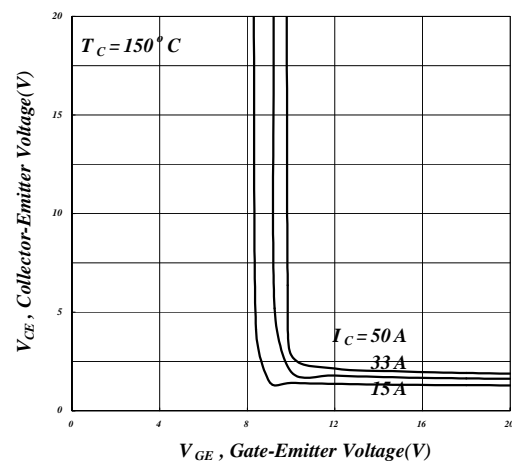


Fig 10. Saturation Voltage vs. V_GE

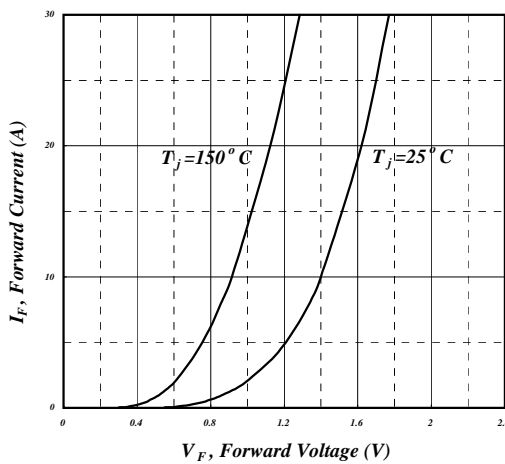


Fig 11. Forward Characteristic of Diode

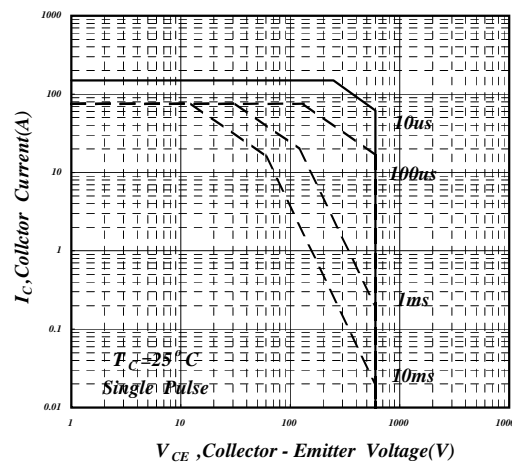


Fig 12. SOA Characteristics