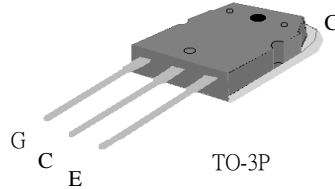


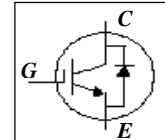


## Features

- ▼ 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	$\pm 30$	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	$V_{GE} = \pm 30V, V_{CE} = 0V$	-	-	$\pm 100$	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	$V_{CE} = V_{GE}, I_C = 250\mu A$	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	$V_{GE} = 15V,$ $R_G = 5\Omega,$ Inductive Load	-	50	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	140	-	ns
$t_f$	Fall Time		-	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

$V_F$	FRD Forward Voltage	$I_F = 20A$	-	1.45	1.8	V
$t_{rr}$	FRD Reverse Recovery Time	$I_F = 20A$	-	60	-	ns
$Q_{rr}$	FRD Reverse Recovery Charge	$di/dt = 100 A/\mu s$	-	120	-	nC

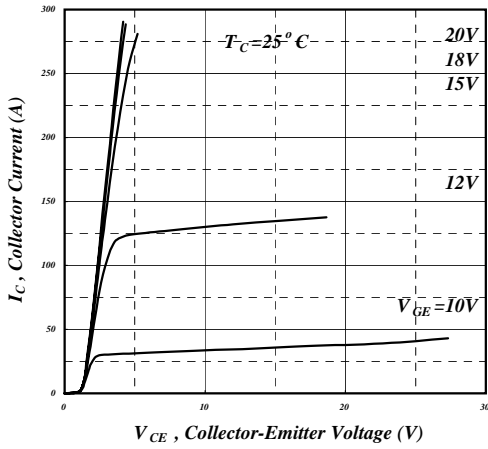


Fig 1. Typical Output Characteristics

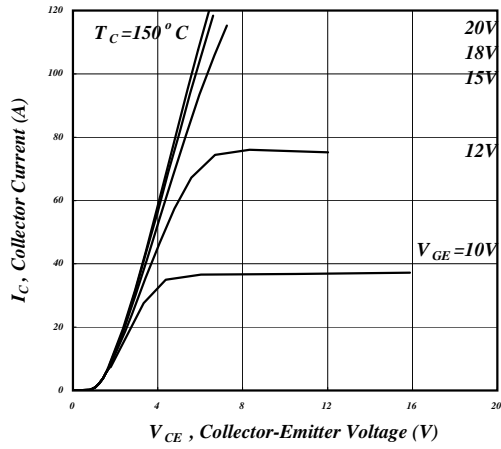


Fig 2. Typical Output Characteristics

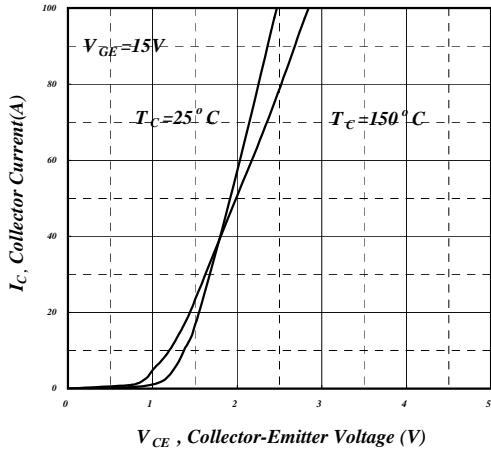


Fig 3. Typical Saturation Voltage Characteristics

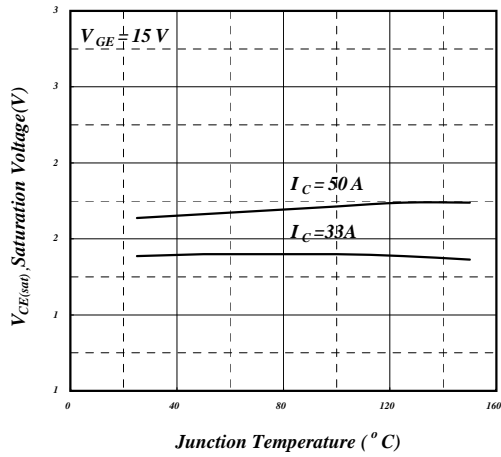


Fig 4. Typical Collector- Emitter Voltage v.s. Junction Temperature

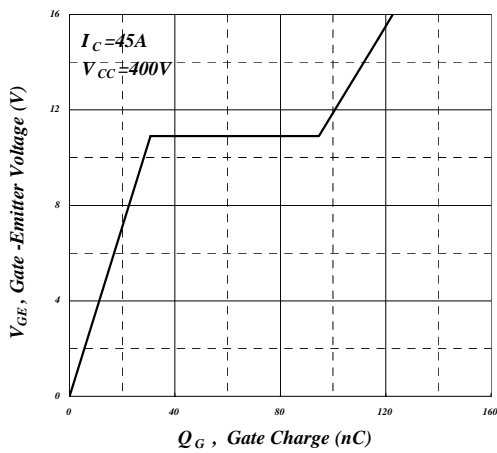


Fig 5. Gate Charge Characteristics

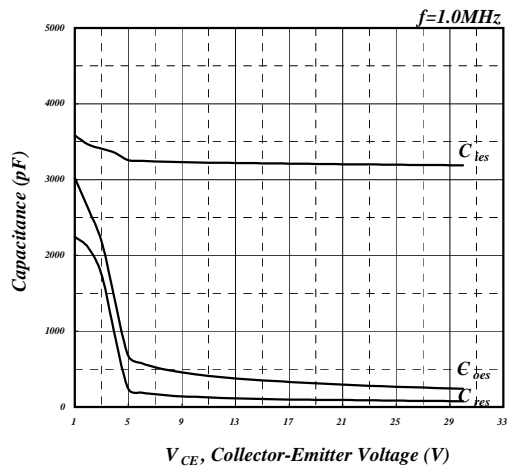


Fig 6. Typical Capacitance Characteristics

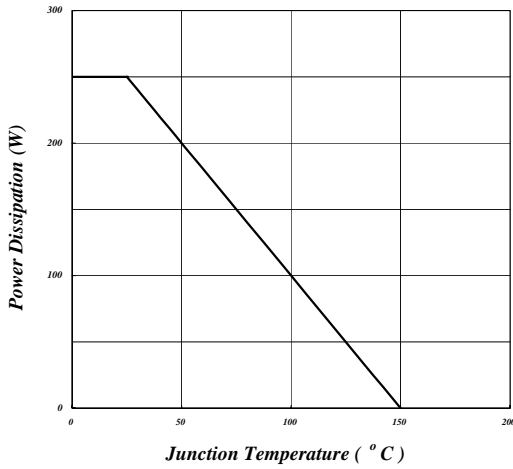


Fig 7. Power Dissipation vs. Junction Temperature

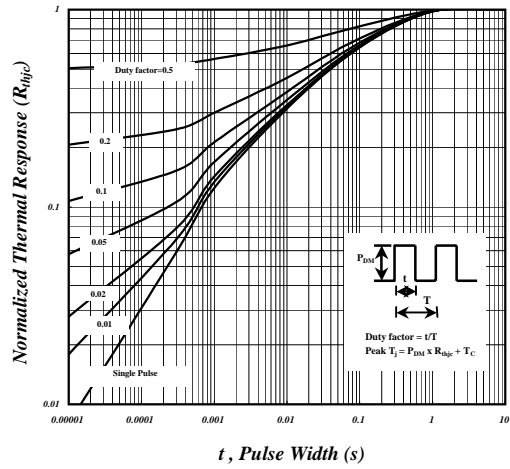


Fig 8. Effective Transient Thermal Impedance, Junction-to-Case (IGBT)

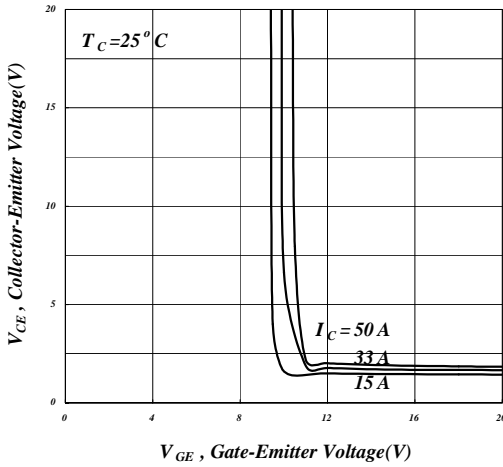


Fig 9. Saturation Voltage vs. V<sub>GE</sub>

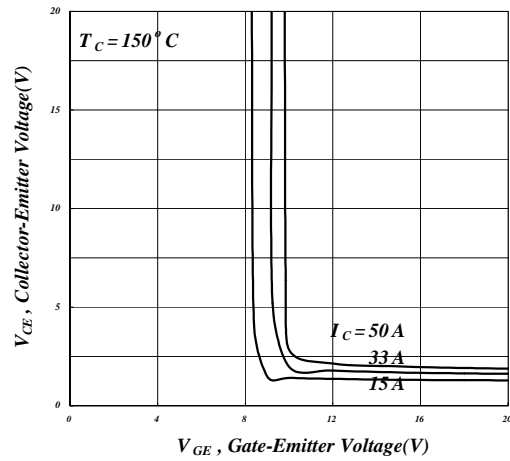


Fig 10. Saturation Voltage vs. V<sub>GE</sub>

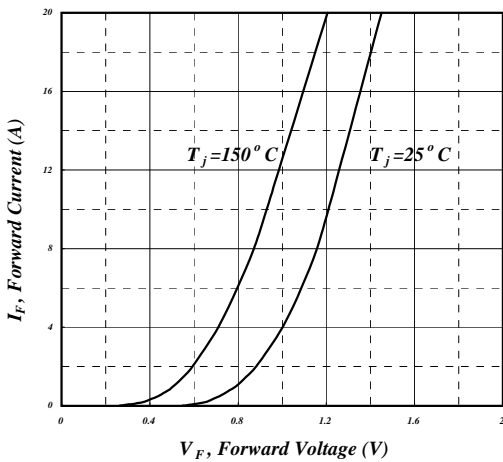


Fig 11. Forward Characteristic of Diode

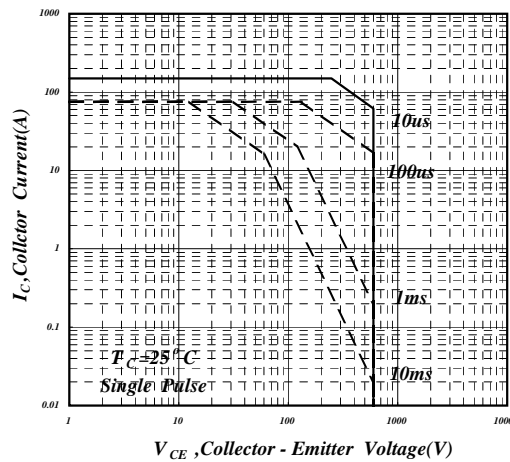


Fig 12. SOA Characteristics