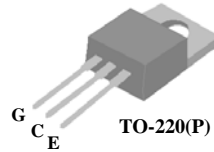


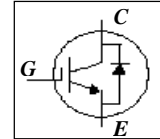


Features

- ▼ High Speed Switching
- ▼ Low Saturation Voltage
 $V_{CE(sat),typ.}=1.7V @ I_C=19A$
- ▼ RoHS Compliant Product



V_{CES}	600V
I_C	19A



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{CES}	Collector-Emitter Voltage	600	V
V_{GE}	Gate-Emitter Voltage	± 20	V
$I_C @ T_C=25^\circ C$	Collector Current	33	A
$I_C @ T_C=100^\circ C$	Collector Current	19	A
I_{CM}	Pulsed Collector Current ¹	72	A
$I_F @ T_C=100^\circ C$	Diode Forward Current	8	A
I_{FM}	Diode Pulse Forward Current	40	A
$P_D @ T_C=25^\circ C$	Maximum Power Dissipation	78.1	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	150	$^\circ C$

Notes:

1. Pulse width limited by Max. junction temperature .

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Thermal Resistance Junction-Case	1.6	$^\circ C/W$
Rthj-c(Diode)	Thermal Resistance Junction-Case	2.4	$^\circ C/W$
Rthj-a	Thermal Resistance Junction-Ambient	62	$^\circ C/W$

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	$V_{GE}=\pm 20V, V_{CE}=0V$	-	-	± 100	nA
I_{CES}	Collector-Emitter Leakage Current	$V_{CE}=600V, V_{GE}=0V$	-	-	1	mA
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=19A$	-	1.7	2.2	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=25A$	-	1.9	-	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{CE}=V_{GE}, I_C=250\mu A$	2	-	6	V
Q_g	Total Gate Charge	$I_C=20A$	-	95	150	nC
Q_{ge}	Gate-Emitter Charge	$V_{CC}=480V$	-	16	-	nC
Q_{gc}	Gate-Collector Charge	$V_{GE}=15V$	-	35	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CE}=480V,$	-	40	-	ns
t_r	Rise Time	$I_C=20A,$	-	20	-	ns
$t_{d(off)}$	Turn-off Delay Time	$V_{GE}=15V,$	-	140	-	ns
t_f	Fall Time	$R_G=5\Omega,$ Inductive Load	-	200	400	ns
E_{on}	Turn-On Switching Loss		-	0.1	-	mJ
E_{off}	Turn-Off Switching Loss		-	1	-	mJ
C_{ies}	Input Capacitance	$V_{GE}=0V$	-	2760	4400	pF
C_{oes}	Output Capacitance	$V_{CE}=30V$	-	65	-	pF
C_{res}	Reverse Transfer Capacitance	$f=1.0MHz$	-	40	-	pF
V_F	FRD Forward Voltage	$I_F=8A$	-	1.8	2.4	V
t_{rr}	FRD Reverse Recovery Time	$I_F=8A$	-	30	-	ns
Q_{rr}	FRD Reverse Recovery Charge	$di/dt = 100 A/\mu s$	-	30	-	nC

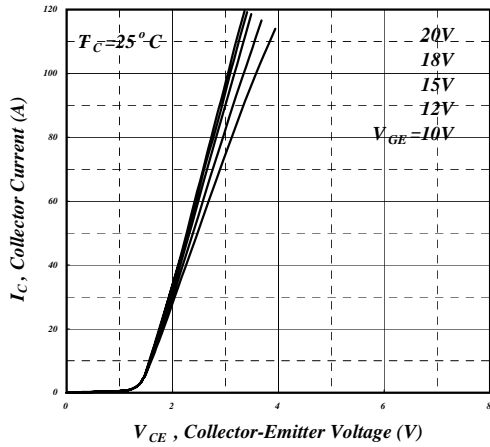


Fig 1. Typical Output Characteristics

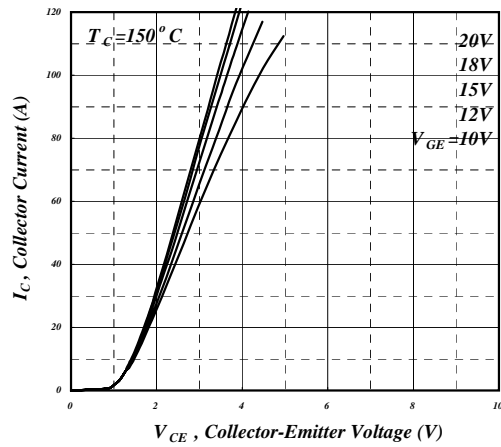


Fig 2. Typical Output Characteristics

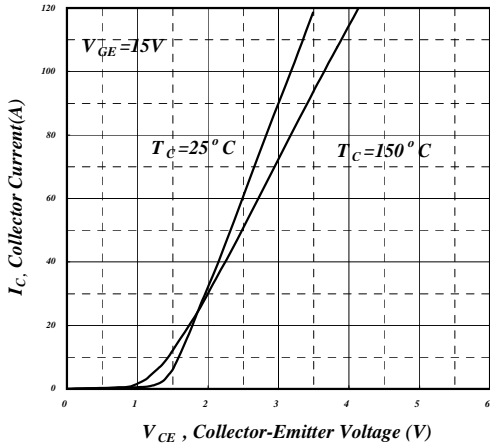


Fig 3. Typical Saturation Voltage Characteristics

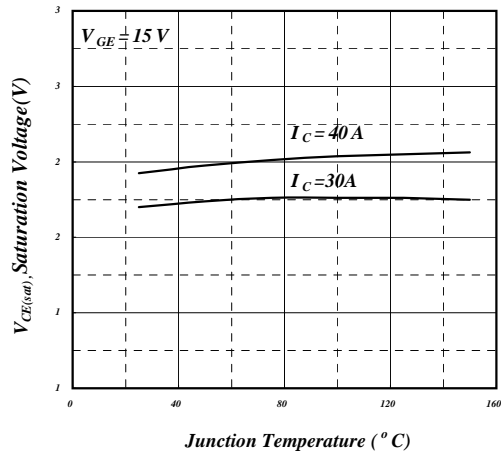


Fig 4. Typical Collector- Emitter Voltage v.s. Junction Temperature

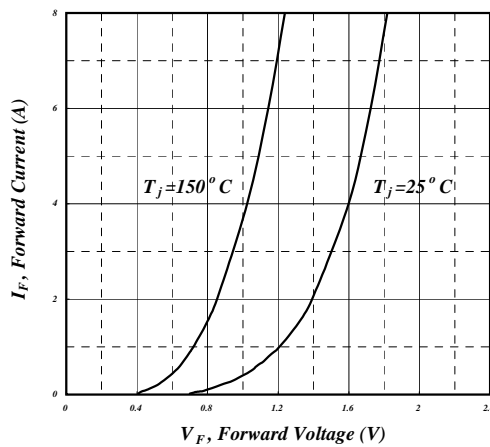


Fig 5. Forward Characteristic of Diode

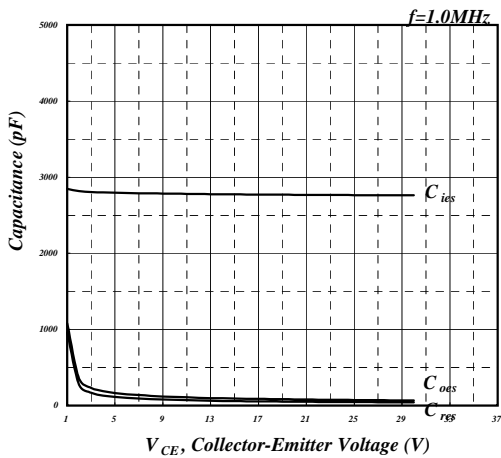


Fig 6. Typical Capacitance Characteristics

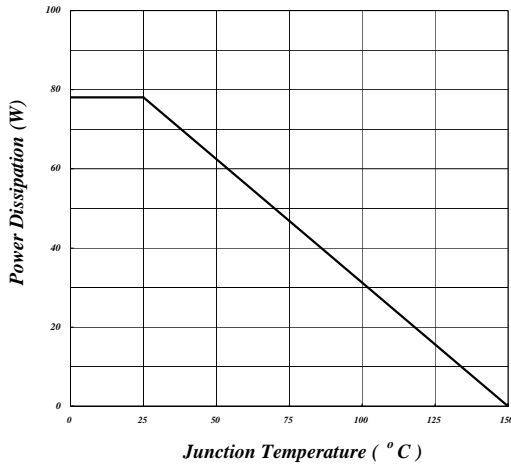


Fig7. Power Dissipation vs. Junction Temperature

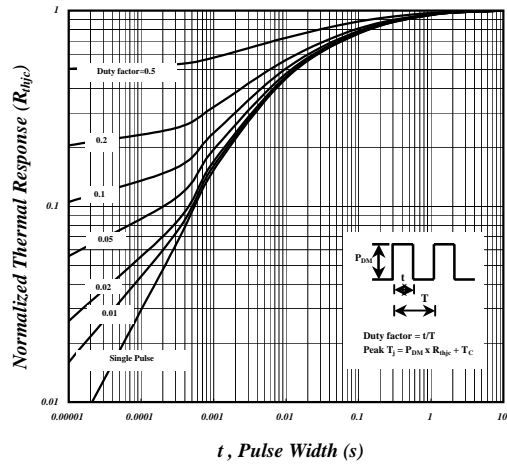


Fig 8. Effective Transient Thermal Impedance

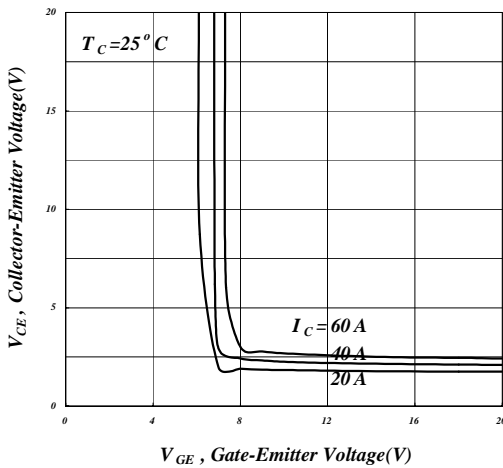


Fig 9. Saturation Voltage vs. V_{GE}

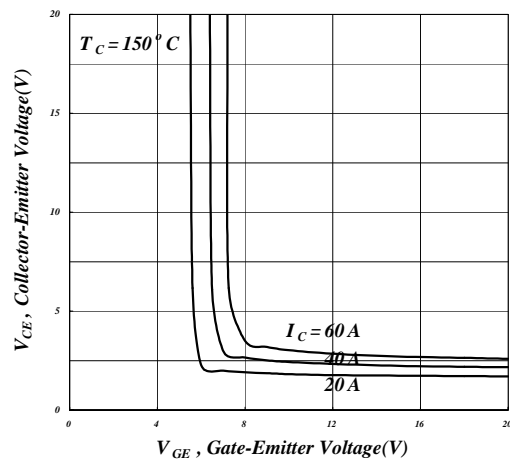


Fig 10. Saturation Voltage vs. V_{GE}

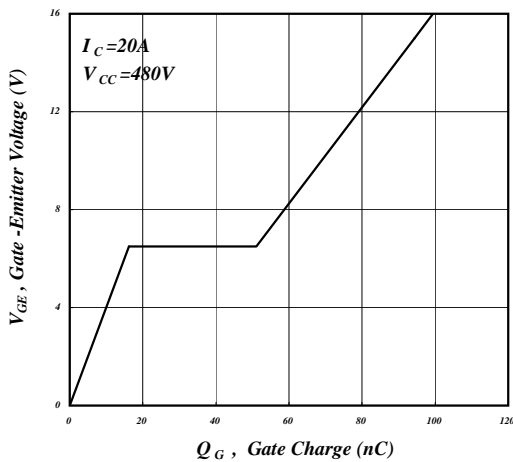


Fig 11. Gate Charge Characteristics

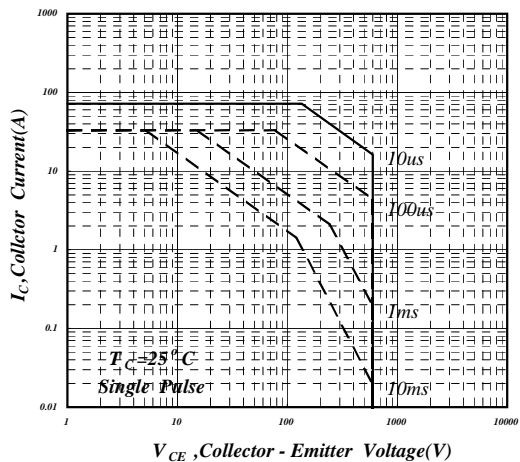


Fig 12. SOA Characteristics