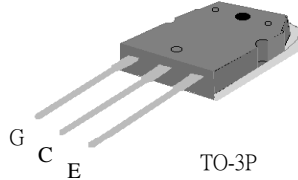


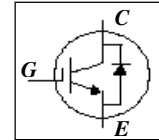


**Features**

- ▼ High Speed Switching
- ▼ Low Saturation Voltage  
 $V_{CE(sat)}=2.3V@I_C=5A$
- ▼ CO-PAK, IGBT With FRD
- ▼ RoHS Compliant & Halogen-Free



$V_{CES}$	1200V
$I_C$	10.5A



**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
$V_{CES}$	Collector-Emitter Voltage	1200	V
$V_{GE}$	Gate-Emitter Voltage	$\pm 30$	V
$I_C@T_C=25^\circ C$	Collector Current	21	A
$I_C@T_C=100^\circ C$	Collector Current	10.5	A
$I_{CM}$	Pulsed Collector Current <sup>1</sup>	42	A
$I_F@T_C=100^\circ C$	Diode Forward Current	6	A
$I_{FM}$	Diode Pulse Forward Current	40	A
$P_D@T_C=25^\circ C$	Maximum Power Dissipation	125	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 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(IGBT)	Thermal Resistance Junction-Case	1	$^\circ C/W$
Rthj-c(Diode)	Thermal Resistance Junction-Case	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	$V_{GE}=\pm 30V, V_{CE}=0V$	-	-	$\pm 500$	nA
$I_{CES}$	Collector-Emitter Leakage Current	$V_{CE}=1200V, V_{GE}=0V$	-	-	1	mA
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=5A$	-	2.3	2.7	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{CE}=V_{GE}, I_C=250\mu A$	3	-	7	V
$Q_g$	Total Gate Charge	$I_C=5A$	-	33	53	nC
$Q_{ge}$	Gate-Emitter Charge	$V_{CC}=600V$	-	6.5	-	nC
$Q_{gc}$	Gate-Collector Charge	$V_{GE}=15V$	-	17.5	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=960V,$ $I_C=5A,$ $V_{GE}=15V,$ $R_G=22\Omega,$ Inductive Load	-	30	-	ns
$t_r$	Rise Time		-	13	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	130	-	ns
$t_f$	Fall Time		-	230	460	ns
$E_{on}$	Turn-On Switching Loss		-	0.3	-	mJ
$E_{off}$	Turn-Off Switching Loss		-	0.5	-	mJ
$C_{ies}$	Input Capacitance	$V_{GE}=0V$	-	680	1088	pF
$C_{oes}$	Output Capacitance	$V_{CE}=30V$	-	65	-	pF
$C_{res}$	Reverse Transfer Capacitance	$f=1.0MHz$	-	10	-	pF

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_F$	Forward Voltage	$I_F=6A$	-	2.6	3	V
$V_F$	Forward Voltage	$I_F=20A$	-	-	4	V
$t_{rr}$	Reverse Recovery Time	$I_F=10A$	-	54	-	ns
$Q_{rr}$	Reverse Recovery Charge	$di/dt = 100 A/\mu s$	-	138	-	nC

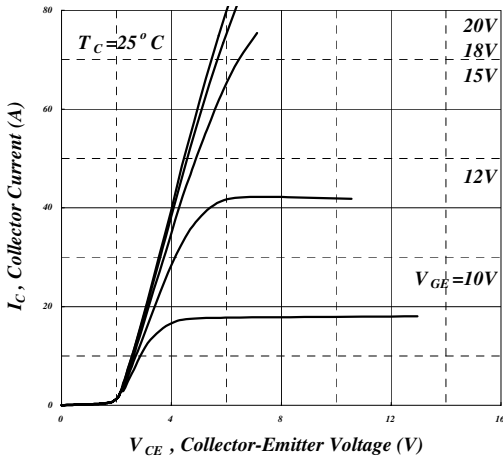


Fig 1. Typical Output Characteristics

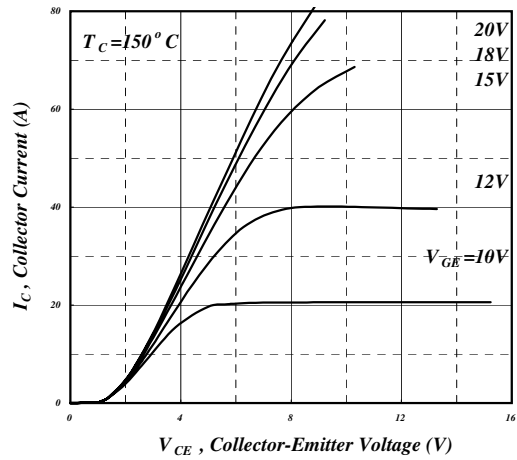


Fig 2. Typical Output Characteristics

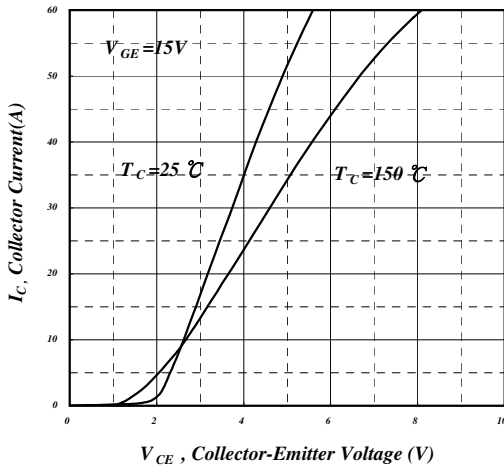


Fig 3. Typical Saturation Voltage Characteristics

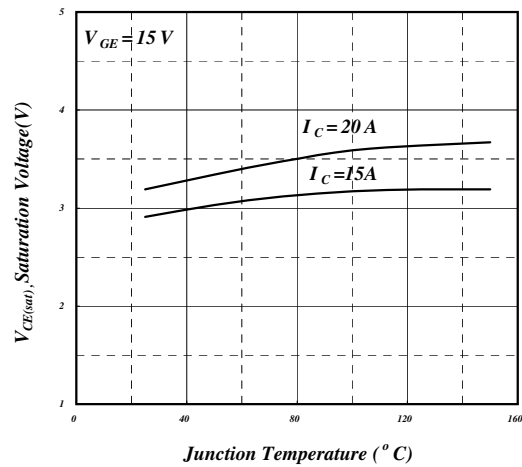


Fig 4. Typical Collector-Emitter Voltage v.s. Junction Temperature

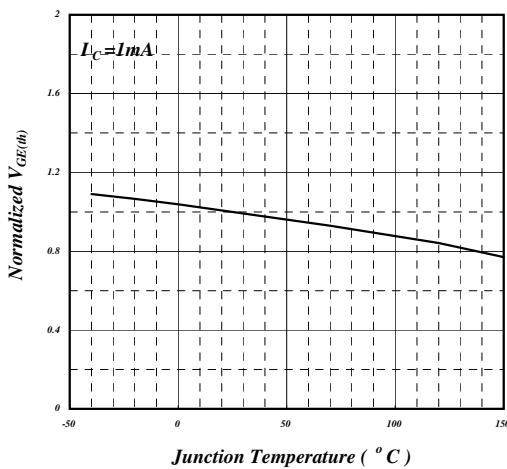


Fig 5. Gate Threshold Voltage v.s. Junction Temperature

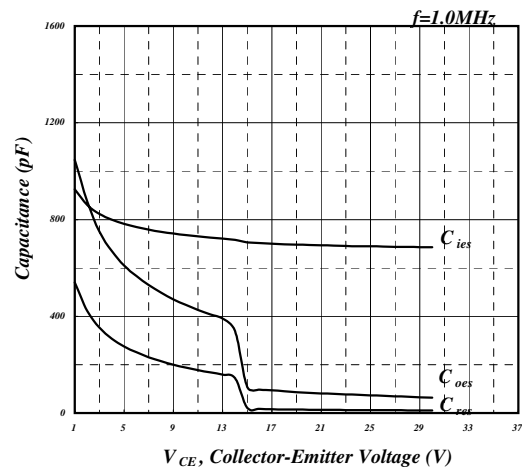


Fig 6. Typical Capacitance Characteristics

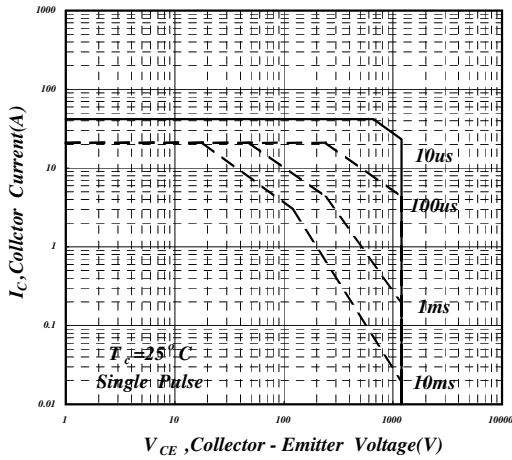


Fig 7. SOA Characteristics

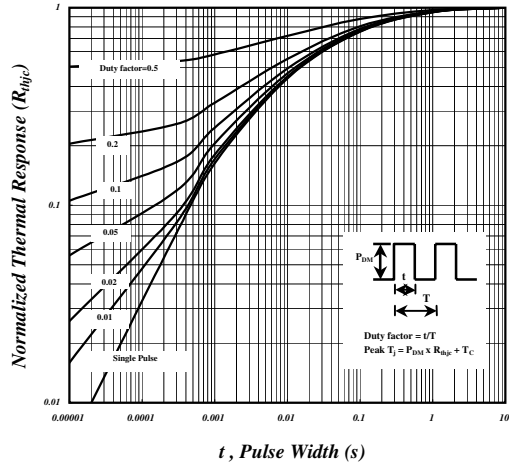


Fig 8. Effective Transient Thermal Impedance

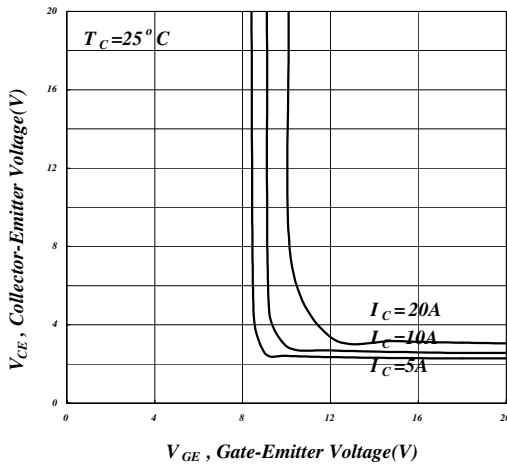


Fig 9. Saturation Voltage vs. V<sub>GE</sub>

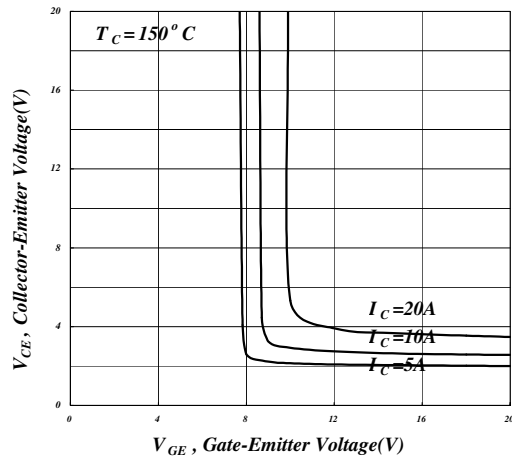


Fig 10. Saturation Voltage vs. V<sub>GE</sub>

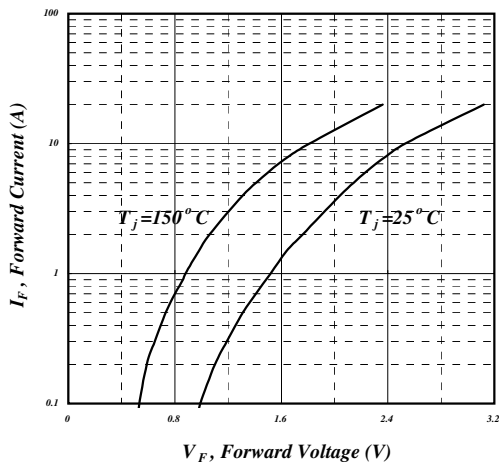


Fig11. Forward Characteristic of Diode

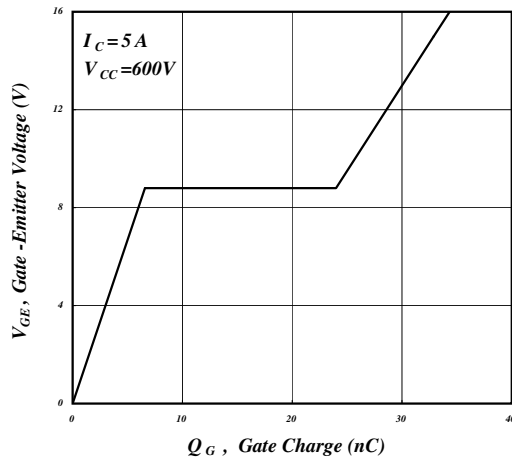


Fig 12. Gate Charge Characteristics