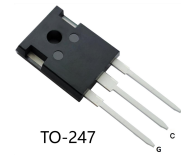


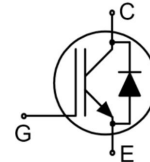
Features

- 650V 75A, $V_{CE(sat)(typ.)}=1.9V@75A$
- Field Stop IGBT Technology
- 10 μ s Short Circuit Capability
- Square RBSOA
- Positive $V_{CE(on)}$ Temperature Coefficient



Applications

- General purpose inverters
- Induction heating(IH)
- Welding Converters
- UPS



Absolute Ratings (T_c=25°C)

Parameter	Symbol		Value	Unit
Collector-Emitter Voltage	Vces		650	V
Continuous Gate-Emitter Voltage	V _{GE}		±20	V
Transient Gate-emitter voltage	V _{GE}		±30	V
Collector Current-continuous	Ic	T _C =25℃	150	A
		T _C =100℃	75	A
Collector Current-pulse(note 1)	I _{CM}		300	A
Diode Forward current, limited by T _{jmax}	I _F	T _C =25℃	150	A
		T _C =100℃	80	A
Diode Maximum Forward Current (note 1)	I _{FM}		300	A
Short Circuit withstand time	t _{sc}		10	μs
Short Circuit Current	I _{SC}		41	A
Power Dissipation	P _D	T _C =25℃	750	W
		T _C =100℃	375	W
Operating Temperature Range	T _J		-40~175	℃
Storage Temperature Range	T _{STG}		-55~150	℃
Maximum Lead Temperature for Soldering Purposes	T _L		300	℃

Electrical Characteristics($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Off-Characteristics						
Collector-Emitter Voltage	BV_{CES}	$I_C=250\mu A, V_{GE}=0V$	650	-	-	V
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V$	-	-	250	μA
Gate-body leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=\pm 30V$	-	-	± 200	nA
On-Characteristics						
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_C=250\mu A$	4.0	-	5.5	V
Collector-Emitter saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=75A$	-	1.9	2.2	V
Dynamic Characteristics						
Input capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1.0MHz$	-	2850	-	pF
Output capacitance	C_{oes}		-	410	-	pF
Reverse transfer capacitance	C_{res}		-	185	-	pF
Integrated gate resistor	R_{Gint}	$f=1MHz; V_{pp}=1V$		1.1		Ω
Switching Characteristics						
Turn-On delay time	$t_{d(on)}$	$V_{CC}=400V, I_C=75A, R_G=10\Omega, V_{GE}=15V, T_c=25^{\circ}C$ Inductive Load	-	38	-	ns
Turn-On rise time	t_r		-	118	-	ns
Turn-off delay time	$t_{d(off)}$		-	267	-	ns
Turn-off Fall time	t_f		-	81	-	ns
Turn-on energy	E_{on}		-	4.65	-	mJ
Turn-off energy	E_{off}		-	2.45	-	mJ
Total Gate Charge	Q_g	$V_{CE}=480V, I_C=75A, V_{GE}=15V$	-	340	-	nC
Gate to emitter Charge	Q_{ge}		-	50	-	nC
Gate to Collector charge	Q_{gc}		-	180	-	nC
Anti-Parallel Diode Characteristics and Maximum Ratings						
Diode Forward Voltage	V_F	$V_{GE}=0V, I_F=75A$	-	1.5	-	V

Diode Forward Current	I_F	$T_C=100^{\circ}\text{C}$	-	-	60	A
Diode Reverse recovery time	t_{rr}	$V_{GE}=0\text{V},$ $V_R=400\text{V}$ $I_F=60\text{A}$ $di_F/dt=600/\mu\text{s}$	-	80	-	ns
Reverse recovery charge	Q_{rr}		-	580	-	nC
Reverse Recovery Current	I_{rm}		-	12.5	-	A

Thermal Characteristic

Parameter	Symbol	Max	Unit
IGBT Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.20	$^{\circ}\text{C}/\text{W}$
Diode Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.55	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	80	$^{\circ}\text{C}/\text{W}$

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Order information

Order codes	package	packaging
MSG75T65FQC	TO-247	Tube

Electrical Characteristics(curves)

Fig 1. DC Collector current as a function of case temperature ($V_{GE} \geq 15\text{V}$, $T_j \leq 150^{\circ}\text{C}$)

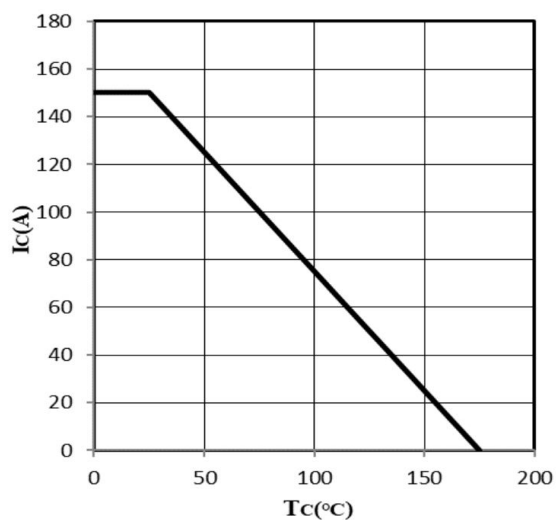


Fig 2. Power dissipation as a function of case temperature ($T_j \leq 150^{\circ}\text{C}$)

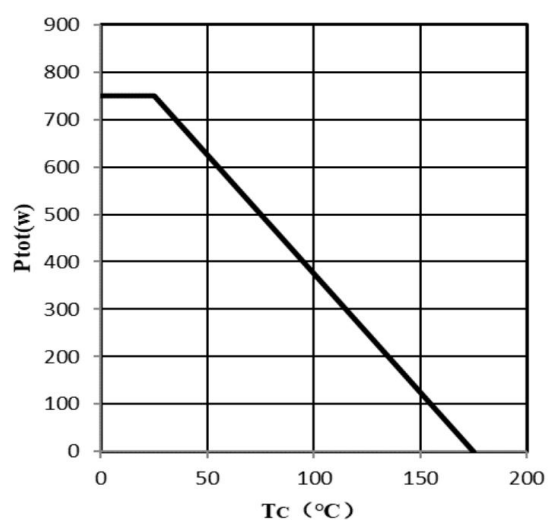


Fig 3. IGBT Forward safe operation area

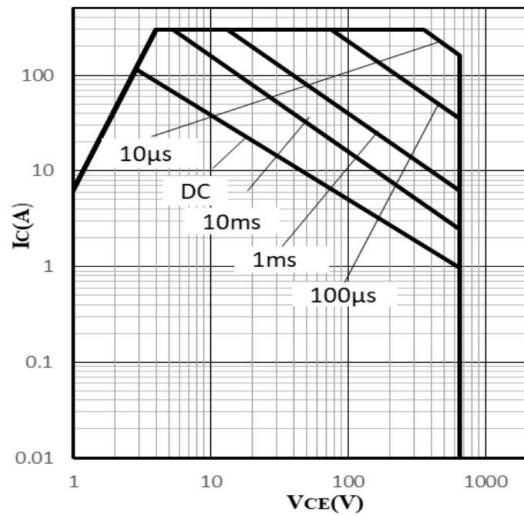


Fig 4. IGBT Reverse safe operation area

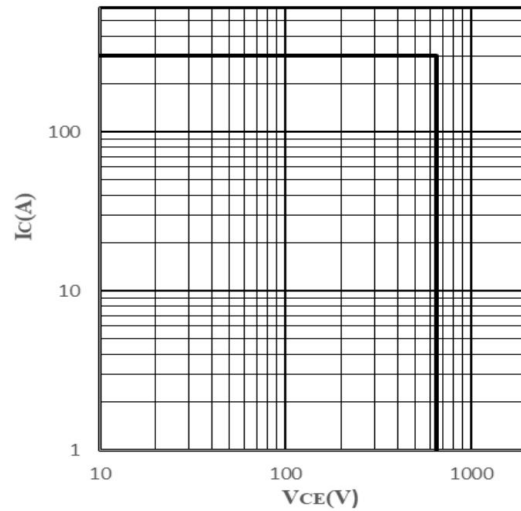


Fig 5. Typical output characteristic ($T_j=25^\circ\text{C}$)

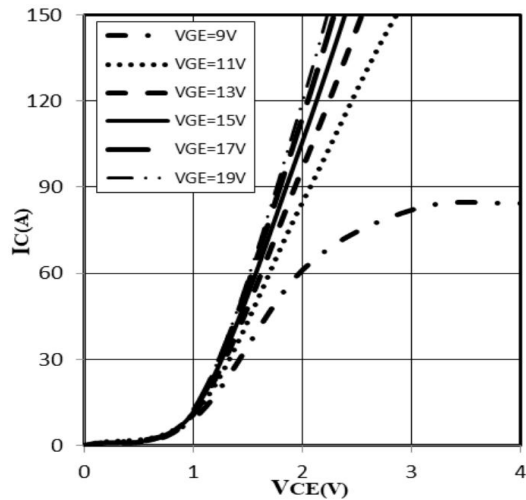


Fig 6. Typical output characteristic ($T_j=125^\circ\text{C}$)

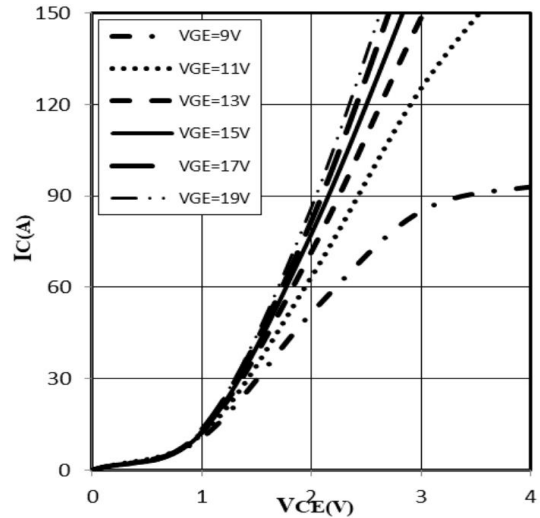


Fig 7. Typical transfer characteristic ($V_{CE}=20\text{V}$)

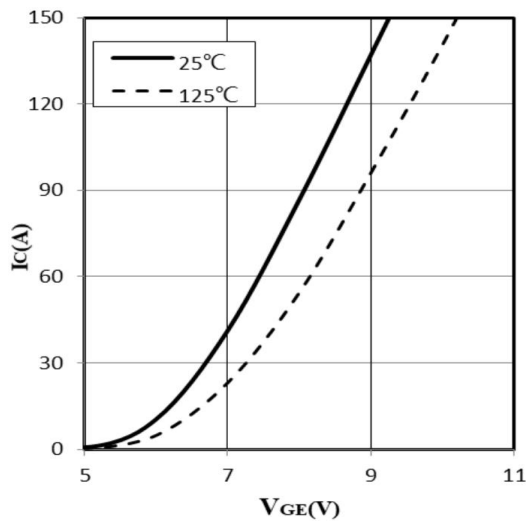


Fig 8. Typical collector-emitter saturation voltage as a function of junction temperature ($V_{GE}=15\text{V}$)

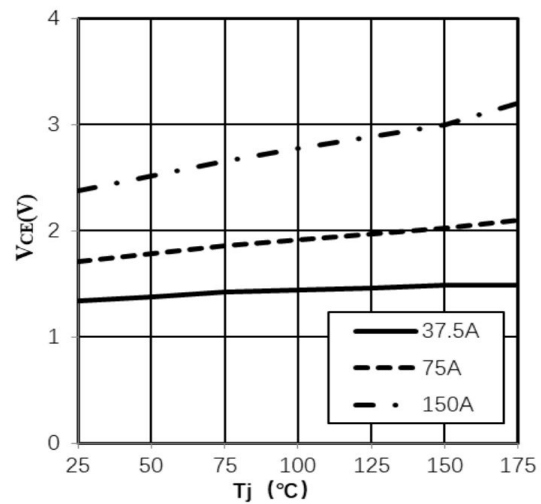


Fig 9. Typical collector-emitter saturation voltage as a function of V_{GE} ($T_j=25^\circ\text{C}$)

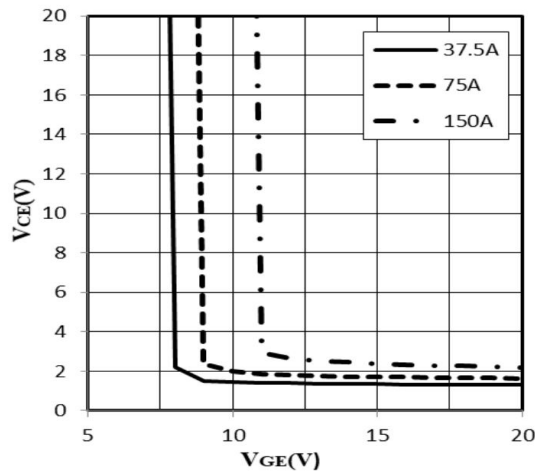


Fig 10. Typical collector-emitter saturation voltage as a function of V_{GE} ($T_j=125^\circ\text{C}$)

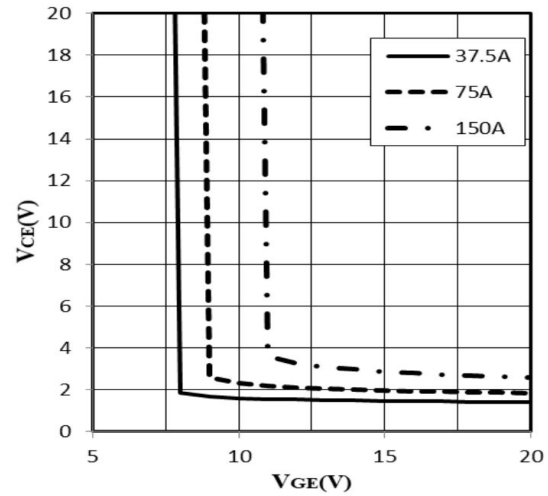


Fig 11. Typical switch energy as a function of I_c (inductive load, $T_j=25^\circ\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $R_G=10\Omega$)

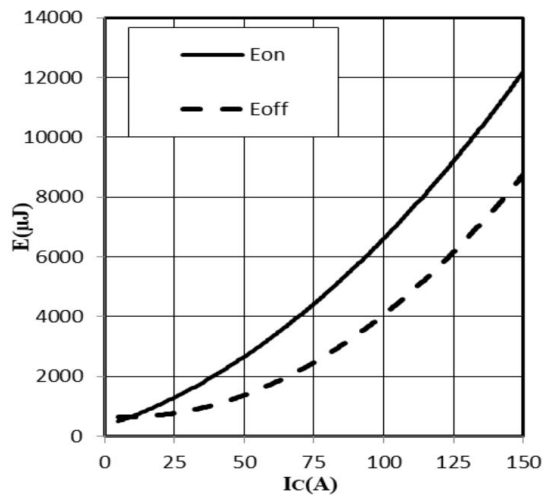


Fig 12. Typical switch time as a function of I_c (inductive load, $T_j=25^\circ\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $R_G=10\Omega$)

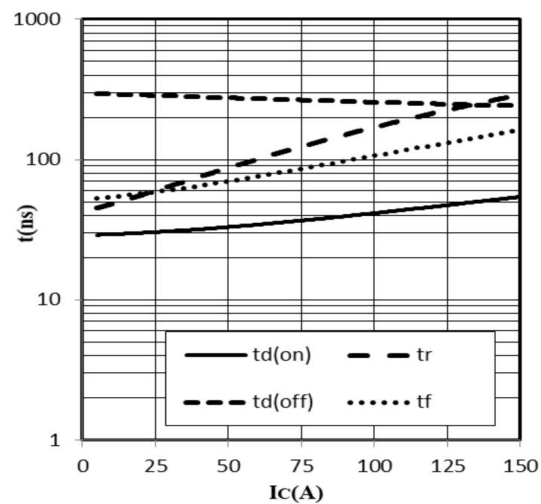


Fig 13. Typical switch energy as a function of R_G (inductive load, $T_j=25^\circ\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $I_c=75\text{A}$)

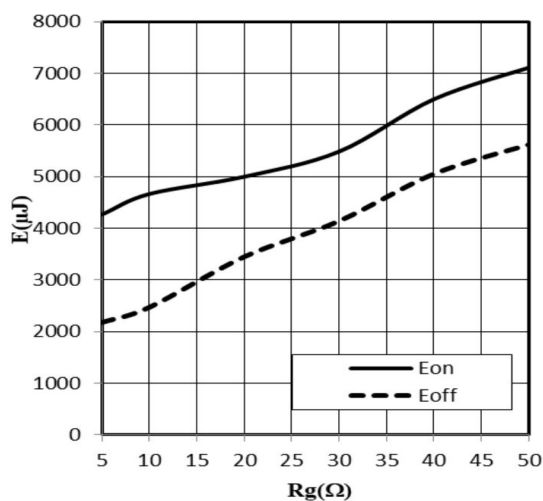


Fig 14. Typical switch time as a function of R_G (inductive load, $T_j=25^\circ\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $I_c=75\text{A}$)

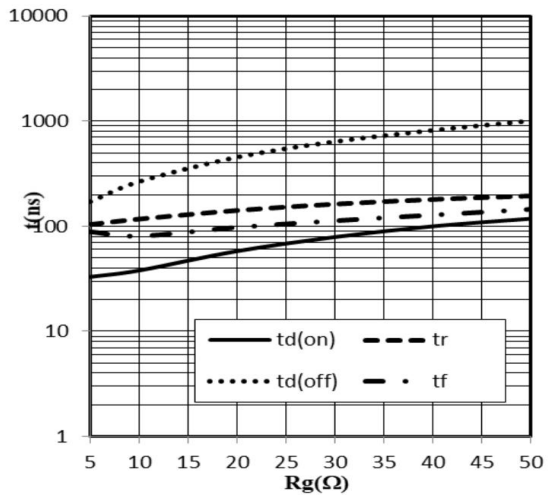


Fig 15. Typical capacitance as a function of collector-emitter voltage ($V_{GE}=0V, f=1MHz$)

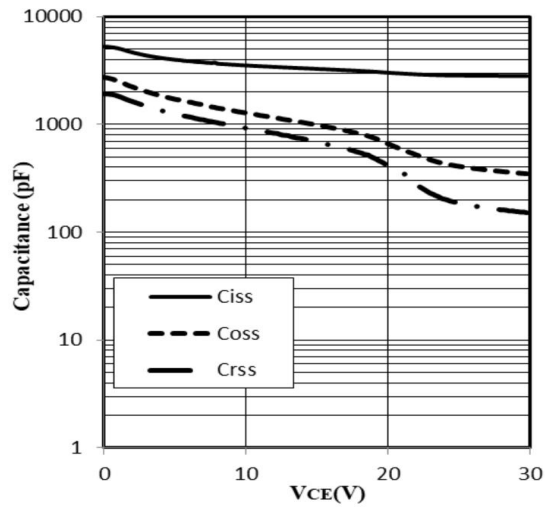


Fig 16. Typical gate charge ($I_c=75A$)

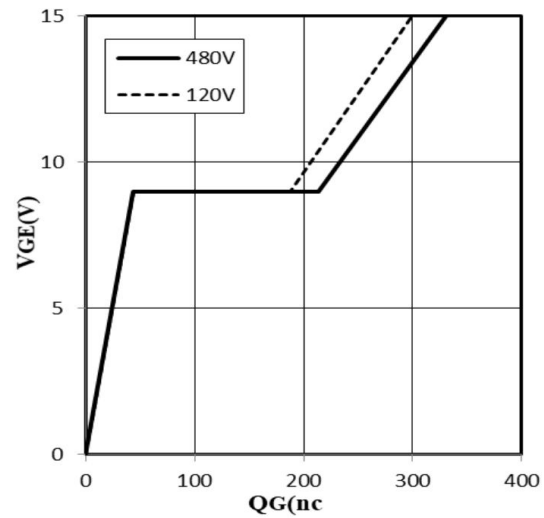


Fig 17. Typical diode forward current as a function of forward voltage

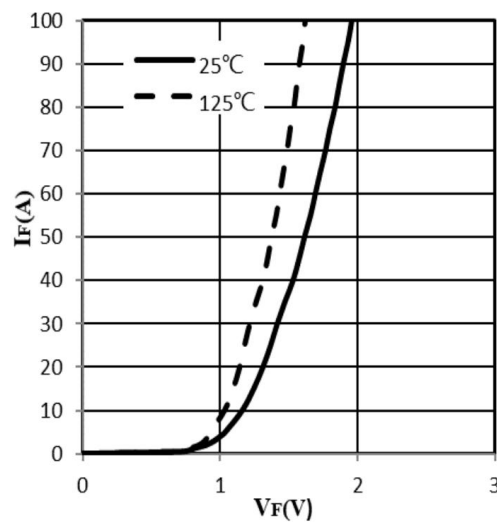
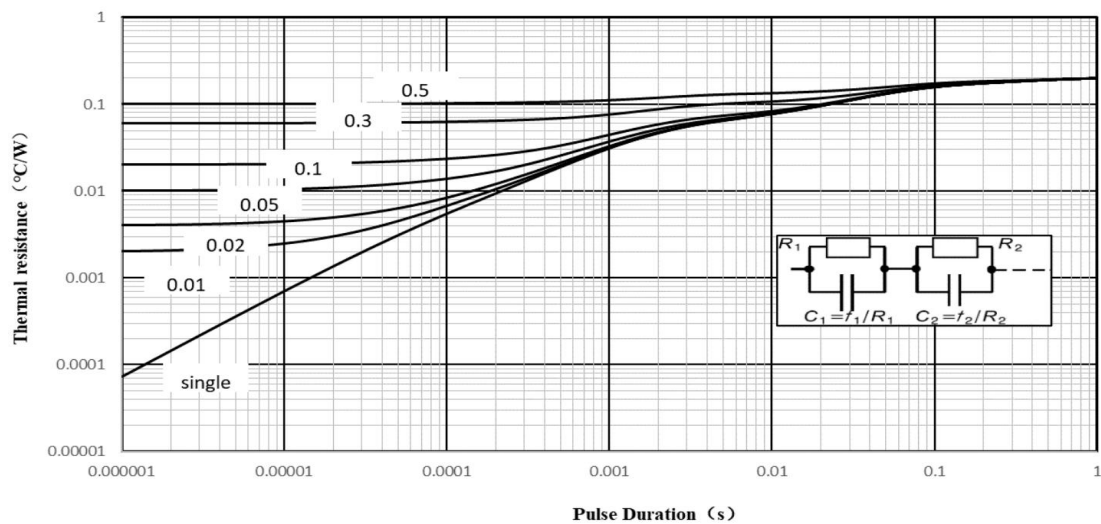


Fig 18. IGBT transient thermal resistance($D=tp/T$)



Package Mechanical DATA

