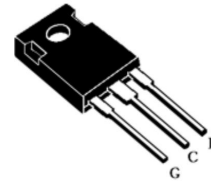


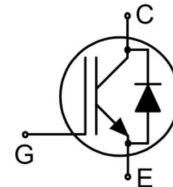
### Features

- Low gate charge
- Short circuit withstand time 10  $\mu$ S
- Saturation voltage:  $V_{CE(sat)}$ , typ=1.65V



### Applications

- General purpose inverter
- Induction heating (IH)
- UPS



### Order Message

Order codes	Marking	Package
MSG75T65FQC	MSG75T65FQC	TO-247

### Absolute Ratings( $T_c=25^\circ\text{C}$ )

Parameter	Symbol	Value	Unit
Collector-Emmitter Voltage	$V_{ce}$	650	V
Collector Current-continuous	$T=25^\circ\text{C}$	150	A
	$T=100^\circ\text{C}$	75	A
Collector Current-pulse (note 1)	$I_{CM}$	300	A
Gate-EMMiter Voltage	$V_{GES}$	$\pm 20$	V
Turn-off safe area	-	75	A
Power Dissipation	PD $T_c=25^\circ\text{C}$	625	W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$
Maximum Lead Temperature for Soldering Purposes	$T_L$	300	$^\circ\text{C}$

1 Diode RMS forward current,  $T_c=25^\circ\text{C}$  150A  $T_c=100^\circ\text{C}$  75A

**Electrical Characteristics**

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
<b>Off-Characteristics</b>						
Collector-Emmitter Voltage	$BV_{CES}$	$I_c=250\mu A, V_{GE}=0V$	650	-	-	V
Zero Gate Voltage Collector Current	$I_{CES}$	$V_{CE}=650V, V_{GE}=0V$	-	-	80	$\mu A$
Gate-body leakage current, forward	$I_{GESF}$	$V_{CE}=0V, V_{GE}=20V$	-	-	200	nA
Gate-body leakage current, reverse	$I_{GESR}$	$V_{CE}=0V, V_{GE}=-20V$	-	-	-200	nA
<b>On-Characteristics</b>						
Gate Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_c=250\mu A$	3.5	-	6.0	V
Collector-Emmitter saturation Voltage	$V_{CESAT}$	$V_{GE}=15V, I_c=75A$	-	1.65	2.1	V
<b>Dynamic Characteristics</b>						
Input capacitance	$C_{ies}$	$V_{CE}=25V,$ $V_{GE}=0V,$ $f=1.0MHz$	-	2643	-	pF
Output capacitance	$C_{oes}$		-	325	-	pF
Reverse transfer capacitance	$C_{res}$		-	58	-	pF

**Electrical Characteristics**

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
<b>Switching Characteristics</b>						
Turn-on delay time	$t_{d(on)}$	$V_{CE}=400V, I_c=75A,$ $R_G=5\Omega$ $T_c=25^\circ C$ Inductive Load	-	26	-	ns
Turn-On rise time	$t_r$		-	120	-	ns
Turn-Off delay time	$t_{d(off)}$		-	94	-	ns
Turn-Off Fall time	$t_f$		-	78	-	ns
Turn-on energy	$E_{on}$		-	2.7	-	mJ
Turn-off energy	$E_{off}$		-	1.6	-	mJ
Total switching energy	$E_{total}$		-	1.3	-	mJ
Total Gate Charge	$Q_g$	$V_{CE}=520V,$ $I_c=75A$ $V_{GE}=15V$	-	141	-	nC
Gate to emitter charge	$Q_{ge}$		-	28	-	nC
Gate to collector charge	$Q_{gc}$		-	81	-	nC

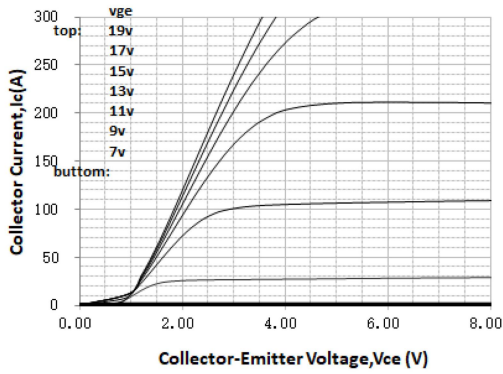
Anti-Parallel Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	$V_F$	$V_{GE}=0V, I_F=75A$	-	2.0	2.6	V
Diode RMS forward current	$I_F$	( $T_c=100^\circ C$ )		75		A
Diode Reverse recovery time	$t_{rr}$	$V_{GE}=0V, V_R=200V$ $I_F=75A$ $di/dt=200A/\mu s$	-	49	-	ns
Reverse recovery charge	$Q_{rr}$		-	121	-	nC
Reverse recovery Current	$I_{rrm}$		-	4.3	-	A

### Thermal Characteristic

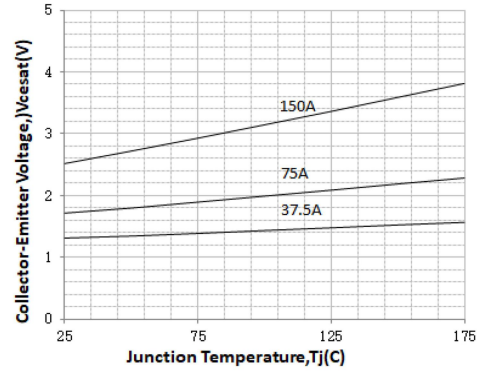
Parameter	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.24	$^\circ C/W$
Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	40	$^\circ C/W$

## Electrical Characteristics (curves)

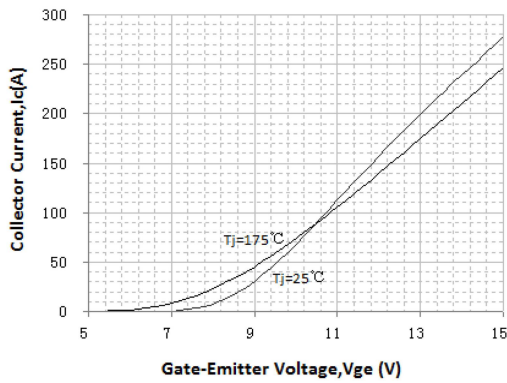
**Output Characteristics (25°C)**



**VCESAT vs. Tj**

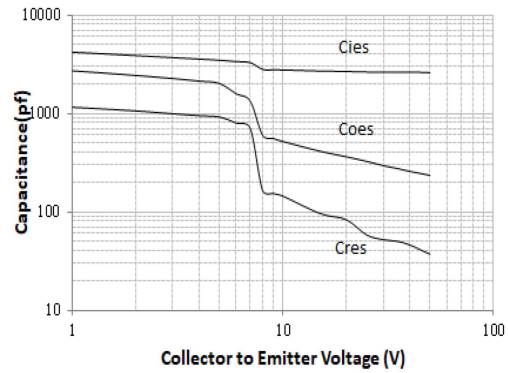


**Transfer Characteristics**



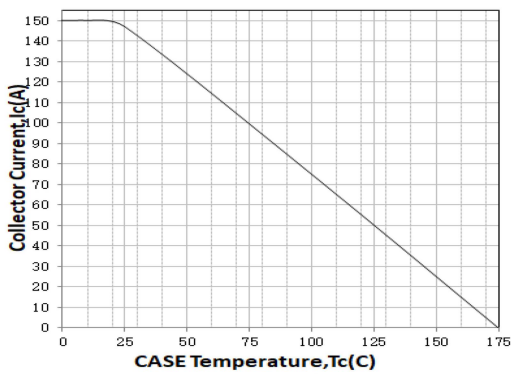
**Capacitance Characteristic**

$V_{ge} = 0V, f = 1.0MHz$



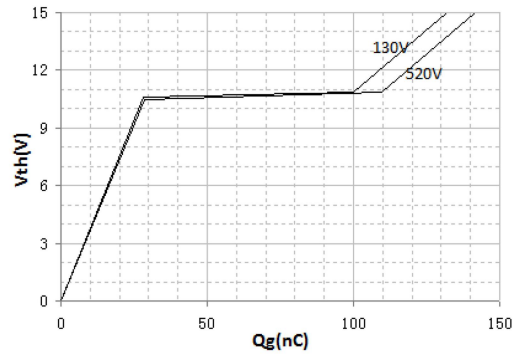
**Collector current vs. case temperature**

$V_{ge} \geq 15V, T_j \leq 175^\circ C$



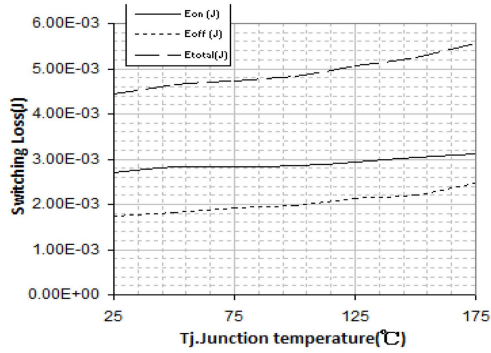
**Gate Charge Characteristics**

$V_{ge} = 15V, I_c = 75A$



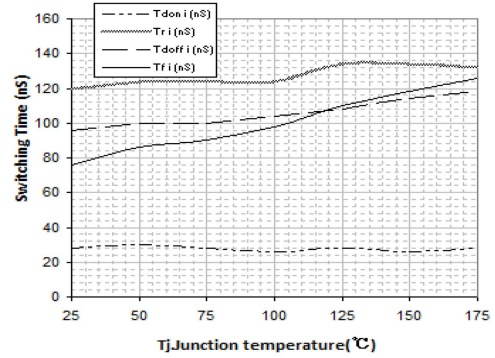
### Switching Loss vs. Tj

Vge=15V, Vce=400V, Ic=75A, Rg=5Ω



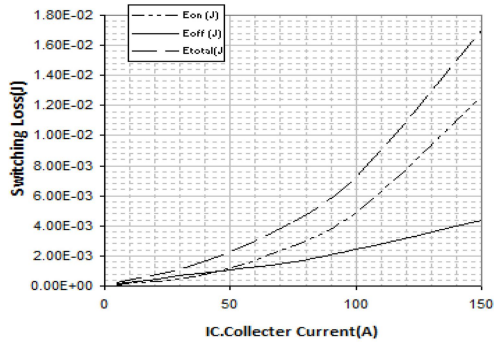
### Switching Time vs. Tj

Vge=15V, Vce=400V, Ic=75A, Rg=5Ω

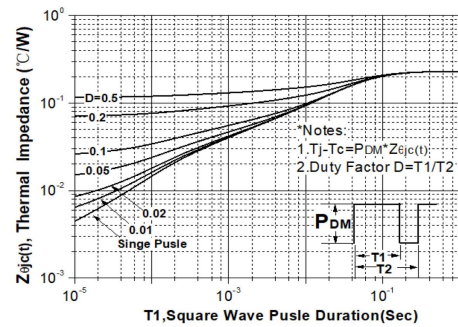


### Switching Loss vs. IC

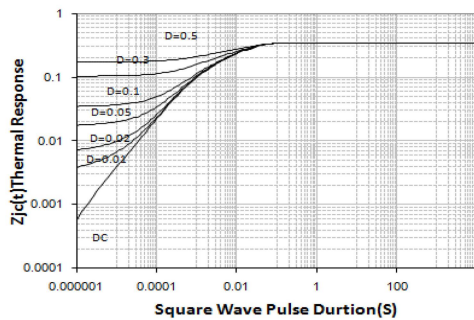
Vce=400V, Vge=15V, Rg=5Ω



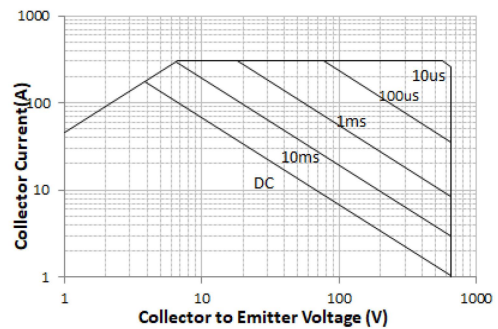
### Transient Thermal Impedance for IGBT



### Transient Thermal Impedance for FRD



### Safe Operating Area



## Package Mechanical DATA

