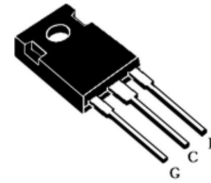


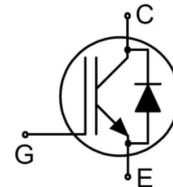
Features

- Low gate charge
- Short circuit withstand time 10 μ 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}	± 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
Off-Characteristics						
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	μA
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
On-Characteristics						
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
Dynamic Characteristics						
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
Switching Characteristics						
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

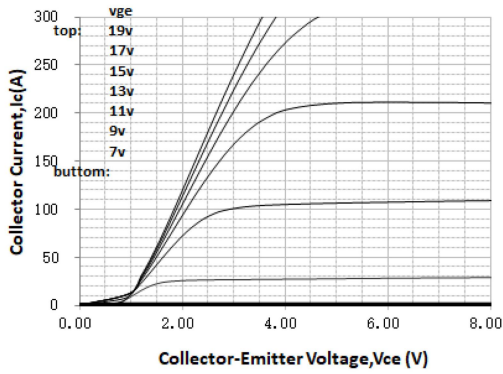
Anti-Parallel Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_F	$V_{GE}=0V, I_F=75A$	-	2.0	2.6	V
Diode RMS forward current	I_F	($T_c=100^\circ C$)		75		A
Diode Reverse recovery time	t_{rr}	$V_{GE}=0V, V_R=200V$ $I_F=75A$ $di/dt=200A/\mu s$	-	49	-	ns
Reverse recovery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

Thermal Characteristic

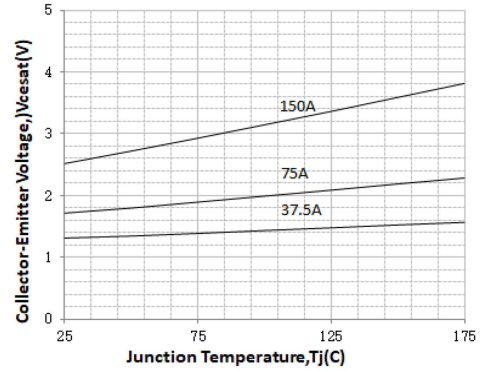
Parameter	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.24	$^\circ C/W$
Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	40	$^\circ C/W$

Electrical Characteristics (curves)

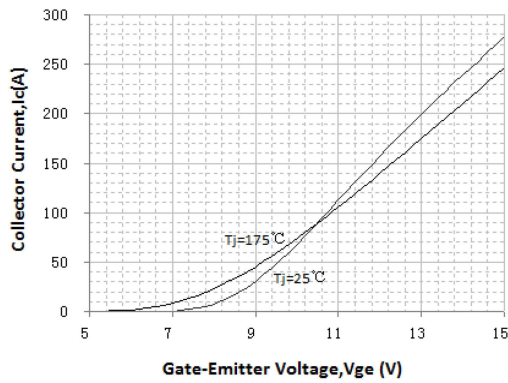
Output Characteristics (25°C)



VCESAT vs. Tj

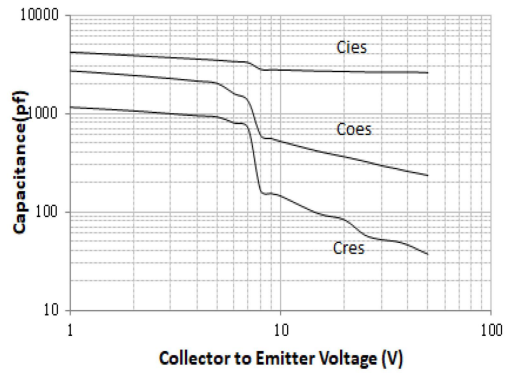


Transfer Characteristics



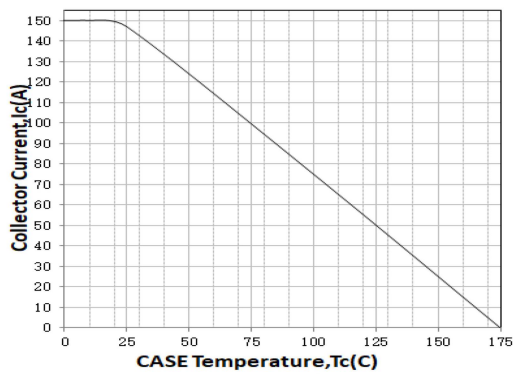
Capacitance Characteristic

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



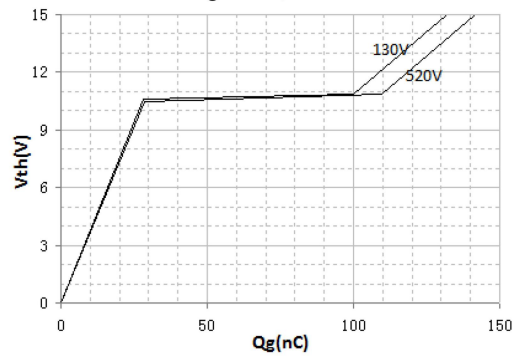
Collector current vs. case temperature

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



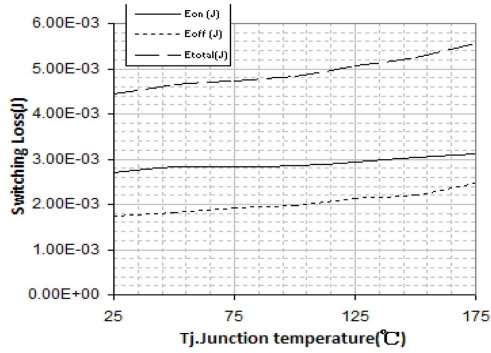
Gate Charge Characteristics

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



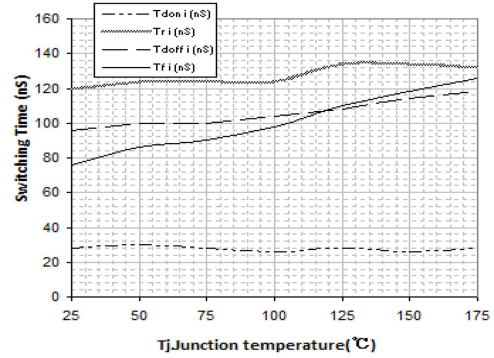
Switching Loss vs. Tj

Vge=15V, Vce=400V, Ic=75A, Rg=5Ω



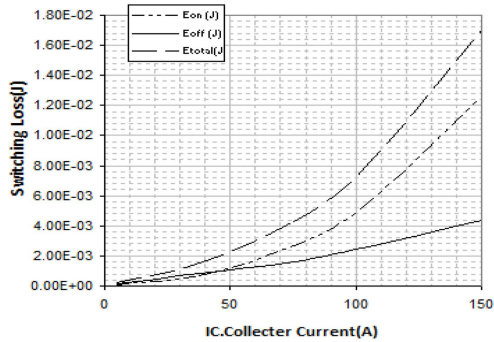
Switching Time vs. Tj

Vge=15V, Vce=400V, Ic=75A, Rg=5Ω

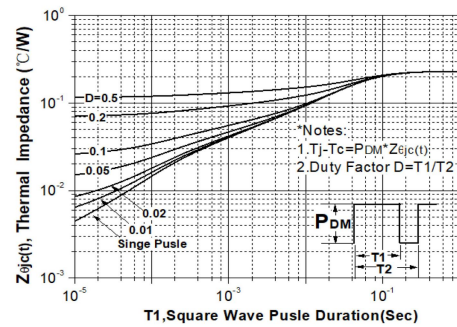


Switching Loss vs. IC

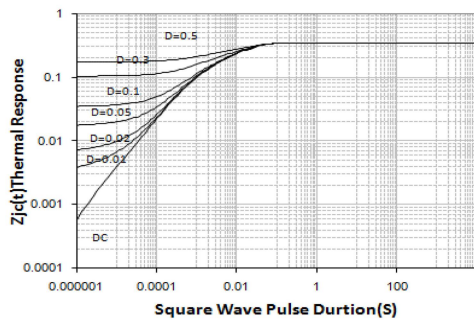
Vce=400V, Vge=15V, Rg=5Ω



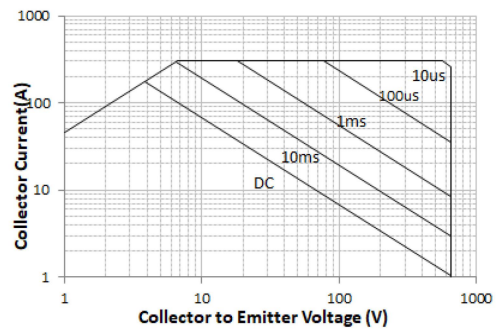
Transient Thermal Impedance for IGBT



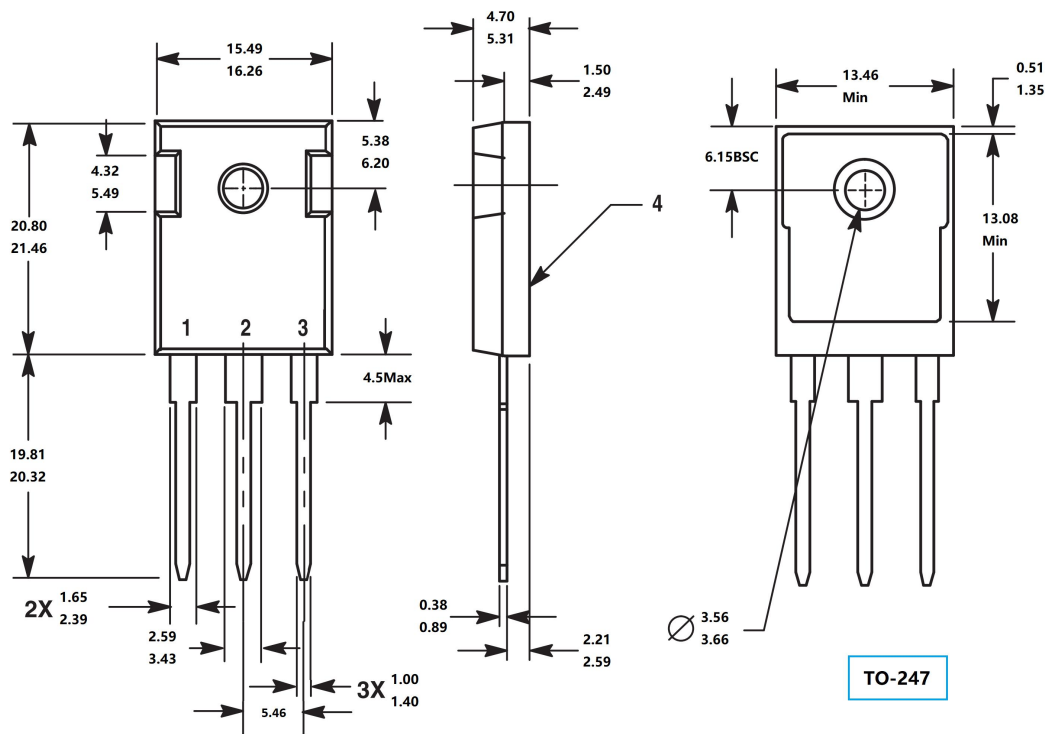
Transient Thermal Impedance for FRD



Safe Operating Area



Package Mechanical DATA



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