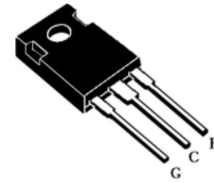


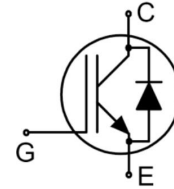
Features

- Low gate charge
- FS Technology
- Saturation voltage: $V_{CE(sat)}$, typ=1.45V



Applications

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



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

Parameter	Symbol		Value	Unit
Collector-Emitter Voltage	V _{ce}		650	V
Gate-Emitter Voltage	V _{GES}		±30	V
Collector Current-continuous	IC	Tj=25℃	160	A
		Tj=100℃	80	
Collector Current-pulse (note 1)	I _{CM}		300	
Diode Forward Current	I _F	Tj=25℃	160	
		Tj=100℃	80	
Surge non repetitive forward current tp= 10 ms sinusoidal	I _{FSM}		160	
Power Dissipation	PD Tc=25℃		260	W
Operating and Storage Temperature Range	T _J ,T _{STG}		-55~+150	℃
Maximum Lead Temperature for Soldering Purposes	T _L		300	℃

Electrical Characteristics

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Collector - Emitter Voltage	BV_{CES}	$I_C=250\mu\text{A}, V_{GE}=0\text{V}$	650	-	-	V
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650\text{V}, V_{GE}=0\text{V}$	-	-	0.2	mA
Gate-body leakage current, forward	I_{GESF}	$V_{CE}=0\text{V}, V_{GE}=20\text{V}$	-	-	200	nA
Gate-body leakage	I_{GESR}	$V_{CE}=0\text{V}, V_{GE}=-20\text{V}$	-	-	-200	nA

current, reverse						
On-Characteristics						
Gate Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE},I_c=250\mu A$	3.5	-	6.5	V
Collector - Emitter saturation Voltage	V_{CESAT}	$V_{GE}=15V\ I_c=70A$ $T_c=25^{\circ}C$	-	1.45	-	V
Dynamic Characteristics						
Input capacitance	C_{ies}	$V_{CE}=25V,$ $V_{GE}=0V,$ $f=1.0MHz$	-	3300	-	pF
Output capacitance	C_{oes}		-	180	-	pF
Reverse transfer capacitance	C_{res}		-	43	-	pF
Total Gate Charge	Q_g	$V_{CE}=300V,$ $I_c=50A$ $V_{GE}=15V(note\ 3,4)$	-	110		nC
Gate to emitter charge	Q_{ge}		-	20	-	nC
Gate to Collector charge	Q_{gc}		-	42	-	nC
Gate resistance	R_g	$f=1\ MHz,$ open collector	-	2.1	-	Ω
short current	I_{sc}	$V_{GE}=15V\ V_{CE}=320V$ $t_{sc}\leq 5\mu s$	-	520	-	A
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{CE}=600V,I_c=80A,$ $R_G=5\Omega$ $T_c=25^{\circ}C$ Inductive Load	-	25	-	ns
Turn-On rise time	t_r		-	30	-	ns
Turn-Off delay time	$t_{d(off)}$		-	340	-	ns
Turn-Off Fall time	t_f		-	230	-	ns
Turn-on energy	E_{on}		-	0.98	-	mJ
Turn-off energy	E_{off}		-	3	-	mJ
Total switching energy	E_{tot}		-	2.91	-	mJ
Anti-Parallel Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_F	$V_{GE}=0V,I_F=50A$	-	1.55	-	V
Diode Reverse recovery time	t_{rr}	$V_{GE}=0V,V_R=480V$ $I_F=80A$ $di/dt=600A/us$ (note 4)	-	75	-	ns
Reverse recovery charge	Q_{rr}		-	664	-	nC
Reverse recovery Current	I_{rr}		-	16	-	A

Thermal Characteristic

Parameter	Symbol	Max	Unit
Thermal Resistance,Junction to Case (IGBT)	$R_{th(j-c)}_{IGBT}$	0.23	°C/W
Thermal Resistance,Junction to Case (FRD)	$R_{th(j-c)}_{FRD}$	0.31	°C/W
Thermal Resistance,Junction to Ambient	$R_{th(j-A)}$	33	°C/W

Order Message

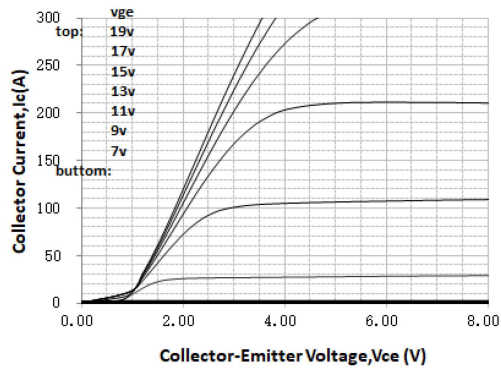
Order codes	Marking	Package
MSG80T65HHC0	MSG80T65HHC0	TO-247

Notes:

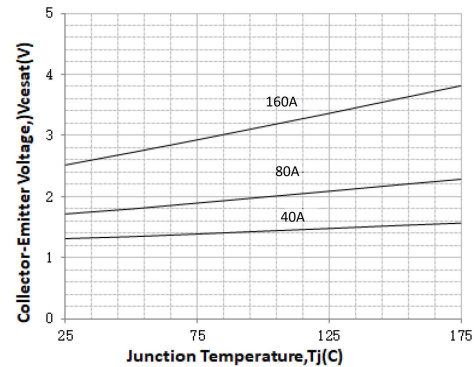
- 1: Pulse width limited by maximum junction temperature
- 2: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 3: Essentially independent of operating temperature

Electrical Characteristics(curves)

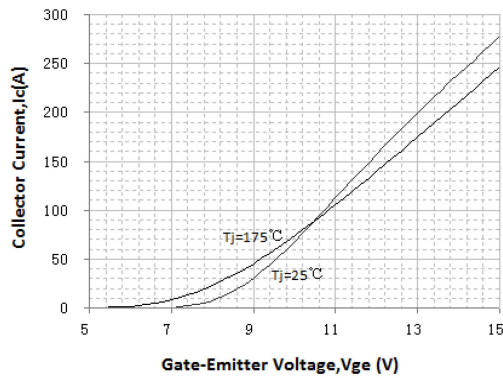
Output Characteristics (25°C)



VCESAT vs. Tj

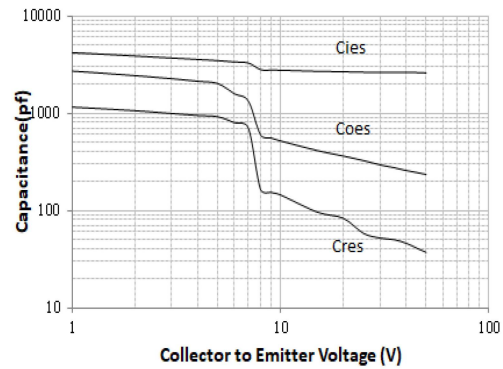


Transfer Characteristics



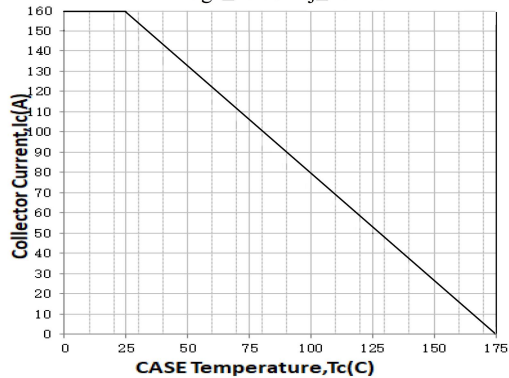
Capacitance Characteristic

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



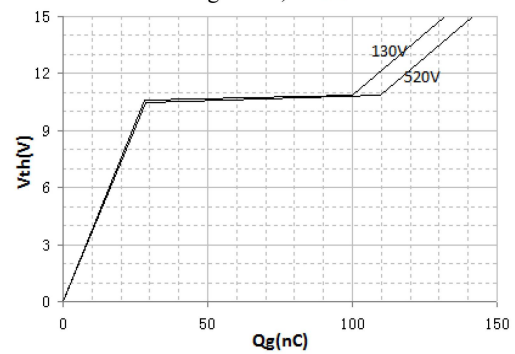
Collector current vs.case temperature

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



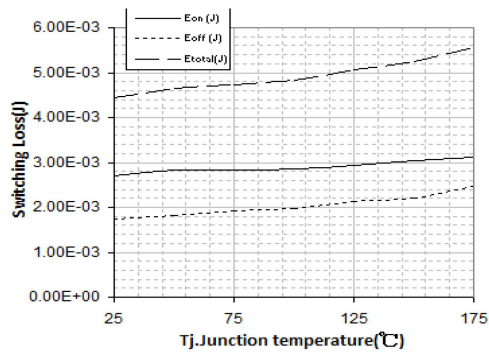
Gate Charge Characteristics

$V_{ge} = 15\text{V}, I_c = 80\text{A}$



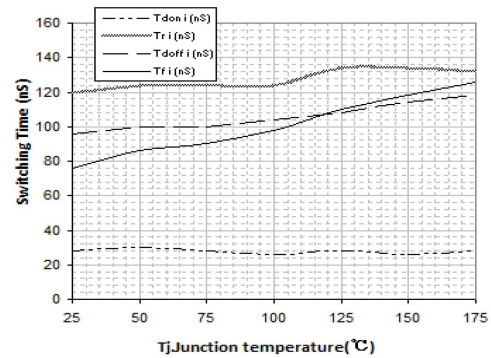
Switching Loss vs. Tj

V_{ge}=15V, V_{ce}=400V, I_c=80A, R_g=5Ω



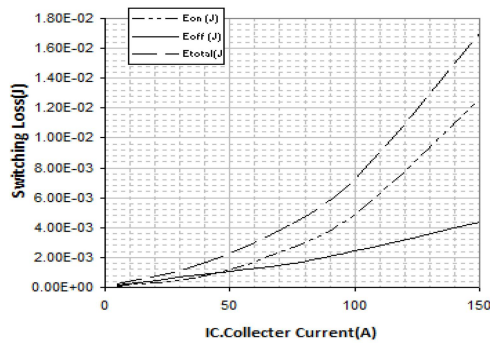
Switching Time vs. Tj

V_{ge}=15V, V_{ce}=400V, I_c=80A, R_g=5Ω

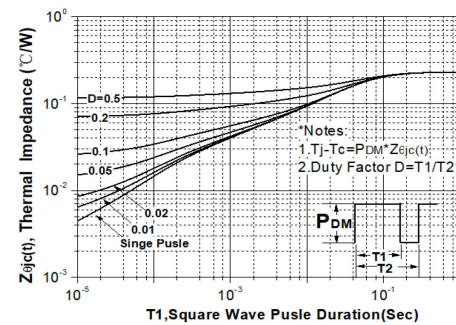


Switching Loss vs. IC

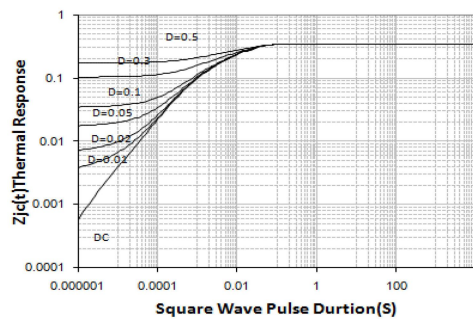
V_{ce}=400V, V_{ge}=15V, R_g=5Ω



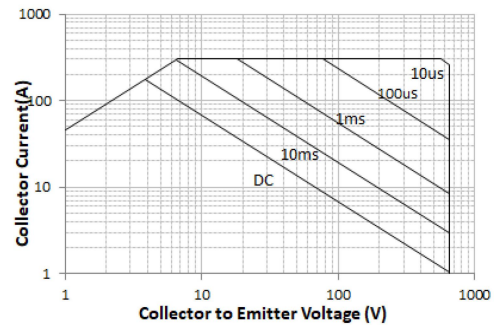
Transient Thermal Impedance for IGBT



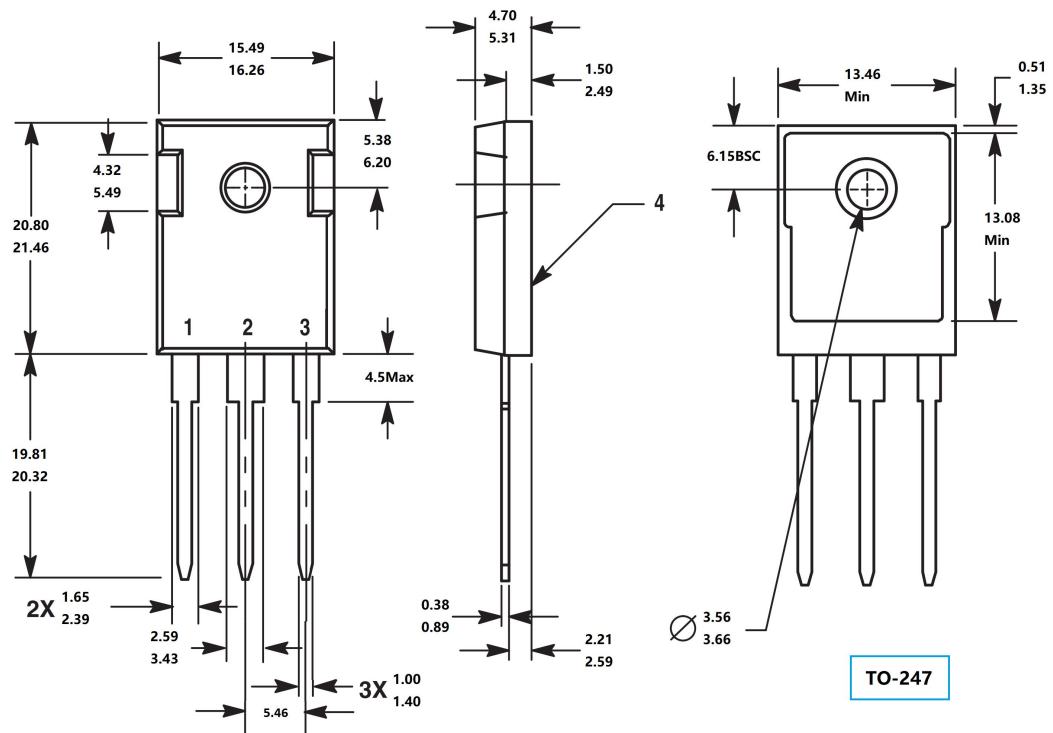
Transient Thermal Impedance for FRD



Safe Operating Area



Package Mechanical DATA



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