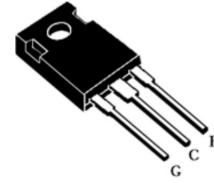


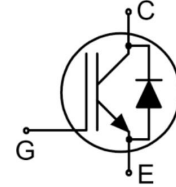
### Features

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



### Applications

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



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

Parameter	Symbol	Value	Unit
Collector-Emmitter Voltage	$V_{ce}$	650	V
Collector Current-continuous	$I_C, T_j=25^\circ C$ $T_j=100^\circ C$	160	A
		80	A
Collector Current-pulse (note 1)	$I_{CM}$	300	A
Gate-Emmitter Voltage	$V_{GES}$	$\pm 30$	V
Diode Forward Current	$I_F, T_j=25^\circ C$ $T_j=100^\circ C$	160	A
		80	A
Power Dissipation	$PD$ $T_c=25^\circ C$	260	W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ C$
Maximum Lead Temperature for Soldering Purposes	$T_L$	300	$^\circ C$

### Electrical Characteristics

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

current, reverse						
<b>On-Characteristics</b>						
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
<b>Dynamic Characteristics</b>						
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

## Electrical Characteristics

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
<b>Switching Characteristics</b>						
Turn-on delay time	$t_{d(on)}$	$V_{CE}=480V, I_c=80A,$ $R_G=5\Omega$ $T_c=25^\circ C$ 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 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
<b>Anti-Parallel Diode Characteristics and Maximum Ratings</b>						
Drain-Source Diode Forward Voltage	$V_F$	$V_{GE}=0V, I_F=50A$	-	1.55	-	V
Diode Reverse recovery time	$t_{rr}$	$V_{GE}=0V, V_R=480V$ $I_F=80A$ $di/dt=600A/\mu s$ (note 4)	-	75	-	ns
Reverse recovery charge	$Q_{rr}$		-	664	-	nC
Reverse recovery Current	$I_{rr}$		-	16	-	A

**Thermal Characteristic**

<b>Parameter</b>	<b>Symbol</b>	<b>Max</b>	<b>Unit</b>
Thermal Resistance, Junction to Case	Rth(j-c)	0.23	°C/W
Thermal Resistance, Junction to Ambient	Rth(j-A)	33	°C/W

**Order Message**

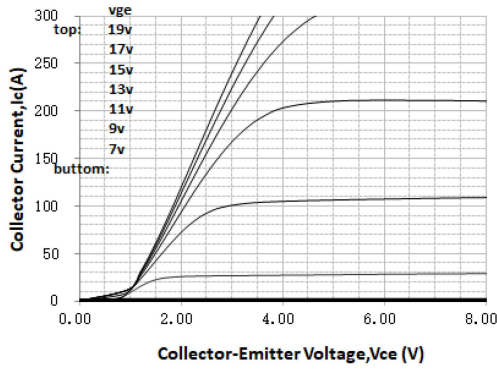
<b>Order codes</b>	<b>Marking</b>	<b>Package</b>
MSG80T65HHC0	MSG80T65HHC0	TO-247

Notes:

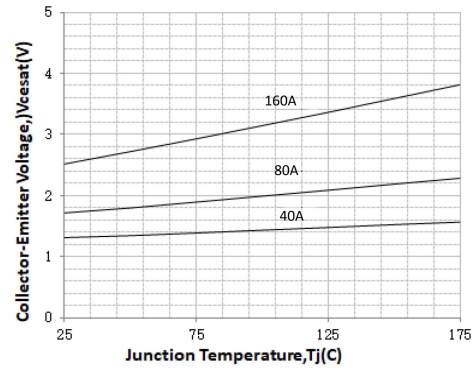
- 1: Pulse width limited by maximum junction temperature
- 2: Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$
- 3: Essentially independent of operating temperature

### Electrical Characteristics (curves)

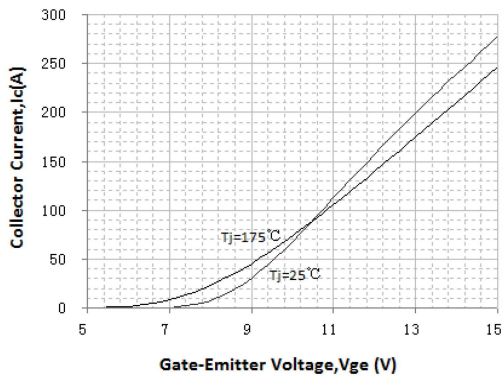
**Output Characteristics (25°C)**



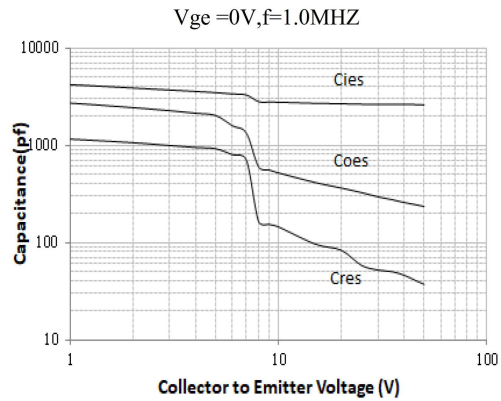
**VCESAT vs. Tj**



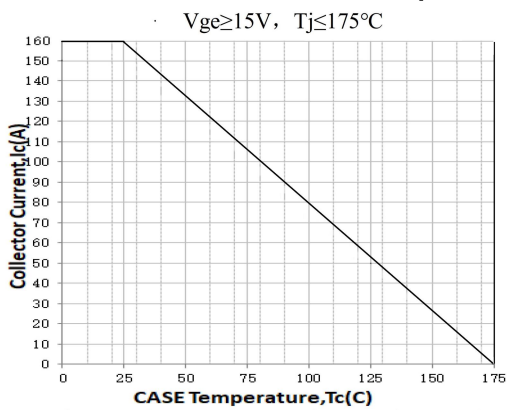
**Transfer Characteristics**



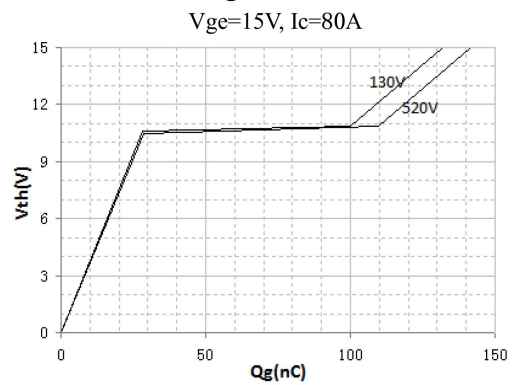
**Capacitance Characteristic**



**Collector current vs. case temperature**

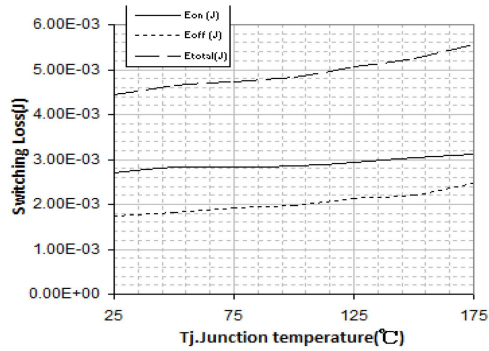


**Gate Charge Characteristics**



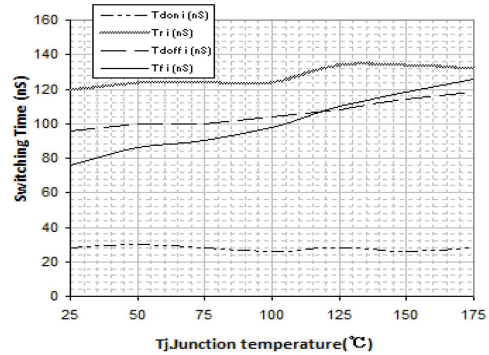
### Switching Loss vs. Tj

Vge=15V, Vce=400V, Ic=80A, Rg=5Ω



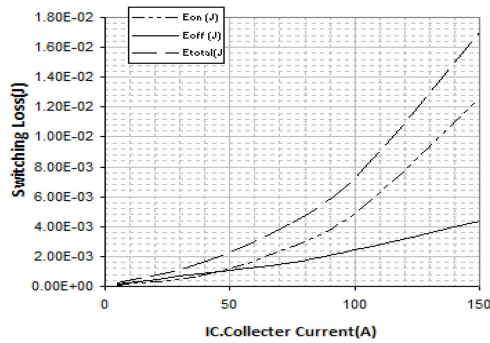
### Switching Time vs. Tj

Vge=15V, Vce=400V, Ic=80A, Rg=5Ω

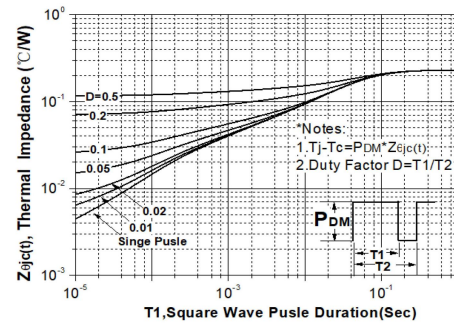


### Switching Loss vs. IC

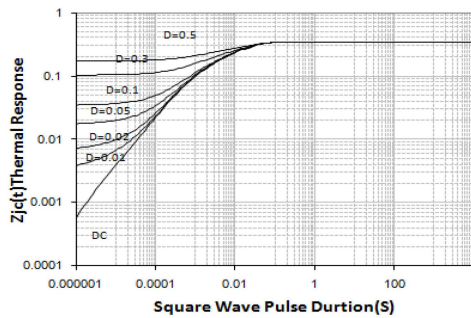
Vce=400V, Vge=15V, Rg=5Ω



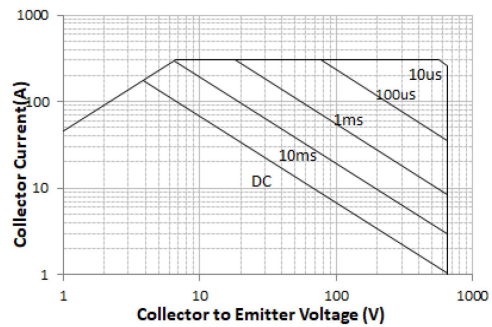
### Transient Thermal Impedance for IGBT



### Transient Thermal Impedance for FRD



### Safe Operating Area



### Package Mechanical DATA

