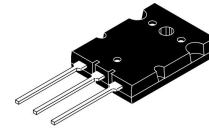
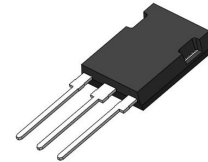
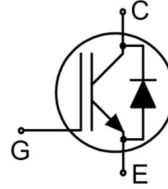


Features

- $V_{CE(sat)(typ.)} = 1.85V @ V_{GE} = 15V, I_C = 75A$
- High speed switching
- Higher system efficiency
- Soft current turn-off waveforms



TO-264



TO-247plus

Applications

- UPS
- AC & DC motor controls
- general purpose inverter .

Absolute Ratings(Tc=25°C)

Parameter	Symbol	Value	Unit
Collector-Emmitter Voltage	V_{ce}	1200	V
Collector Current-continuous	I_C $T=25^{\circ}C$ $T=100^{\circ}C$	115	A
		75	A
Diode forward current	I_F $T_C=100^{\circ}C$	75	A
Collector Current-pulse (note 1)	I_{CM}	230	A
Gate-EMMiter Voltage	V_{GES}	± 30	V
Power Dissipation(TO-264)	PD $T_C=25^{\circ}C$ $T_C=100^{\circ}C$	625	W
		250	W
Power Dissipation(TO-247plus)	PD $T_C=25^{\circ}C$ $T_C=100^{\circ}C$	882	W
		441	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^{\circ}C$
Diode Maximum Forward Current (Note 1)	I_{FM}	250	A
Short Circuit Withstand Time	t_{sc}	10	us
Maximum Lead Temperature for Soldering Purposes	T_L	300	$^{\circ}C$

Electrical Characteristics

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						

Collector-Emmitter Voltage	BV_{CES}	$I_C=250\mu A, V_{GE}=0V$	1200	-	-	V
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V, T_C=25^\circ C$	-	-	100	μA
Gate-body leakage current, forward	I_{GESF}	$V_{CE}=0V, V_{GE}=30V$	-	-	100	nA
Gate-body leakage current, reverse	I_{GESR}	$V_{CE}=0V, V_{GE}=-30V$	-	-	-100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_C=250\mu A$	4.5	-	6.5	V
Collector-Emmitter saturation Voltage	V_{CESAT}	$V_{GE}=15V, I_C=75A$	-	1.85	2.5	V
		$V_{GE}=15V, I_C=75A, T_C=125^\circ C$		2.25		
		$V_{GE}=15V, I_C=115A$		2.15		
Dynamic Characteristics						
Input capacitance	C_{ies}	$V_{CE}=30V, V_{GE}=0V, f=1.0MHz$	-	7348	-	pF
Output capacitance	C_{oes}		-	312	-	pF
Reverse transfer capacitance	C_{res}		-	38	-	pF

Electrical Characteristics

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{CC}=600V, I_C=75A, R_G=10\Omega, V_{GE}=15V, \text{Inductive Load}, T_C=25^\circ C$	-	205	-	ns
Turn-On rise time	t_r		-	470	-	ns
Turn-Off delay time	$t_{d(off)}$		-	130	-	ns
Turn-Off Fall time	t_f		-	295	-	ns
Turn-on switching Loss	E_{on}		-	19.1	-	mJ
Turn-off switching Loss	E_{off}		-	6	-	mJ
Total switching Loss	E_{ts}	-	25.1	-	mJ	
Turn-on delay time	$t_{d(on)}$	$V_{CC}=600V, I_C=75A, R_G=10\Omega, V_{GE}=15V, \text{Inductive Load}, T_C=125^\circ C$	-	190	-	ns
Turn-On rise time	t_r		-	365	-	ns
Turn-Off delay time	$t_{d(off)}$		-	170	-	ns
Turn-Off Fall time	t_f		-	345	-	ns
Turn-on switching Loss	E_{on}		-	15.7	-	mJ

Turn-off switching Loss	E_{off}		-	7.4	-	mJ
Total switching Loss	E_{ts}		-	23.1	-	mJ
Total Gate Charge	Q_g	$V_{CC}=600V,$ $I_c=75A$ $V_{GE}=15V$	-	270	-	nC
Gate to emitter charge	Q_{ge}		-	105	-	nC
Gate to collector charge	Q_{gc}		-	140	-	nC
Anti-Parallel Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_F	$I_F=75A$	-	2.1	3.2	V
Diode Reverse recovery time	t_{rr}	$V_{CE}=400V$ $I_F=75A$ $di/dt=200A/us$	-	530	-	ns
Reverse recovery charge	Q_{rr}		-	1890	-	nC
Diode Reverse recovery Current	I_{RRM}		-	8.5	-	A

Thermal Characteristic

Parameter	Symbol	Max		Unit
		TO-264	TO-247 plus	
Thermal Resistance, Junction to Case (IGBT)	$R_{th(j-c)}$	0.2	0.17	°C/W
Thermal Resistance, Junction to Case (Diode)	$R_{th(j-c)}$	0.4	0.32	°C/W
Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	25	40	°C/W

Notes:

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

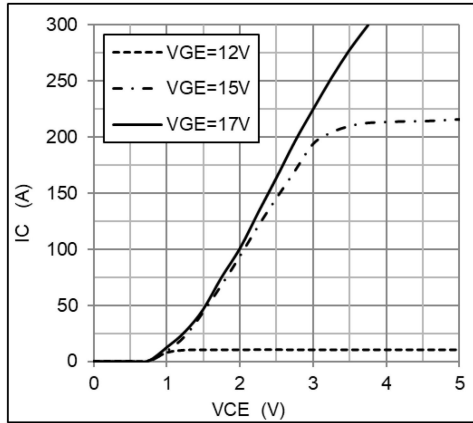
Order Message

Marking	Package
MSG75T120FQW	TO-264
MSG75T120FQC1	TO-247plus

Electrical Characteristics (curves)

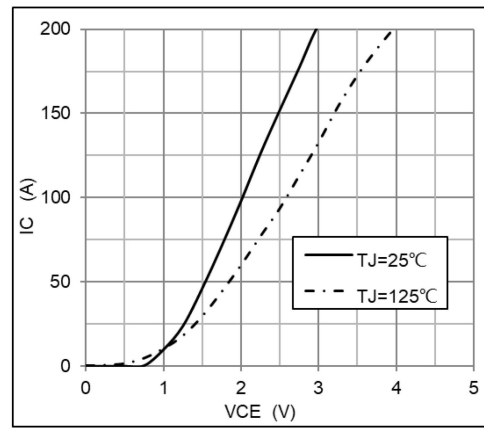
Typical Output Characteristics

$T_c=25^\circ\text{C}$

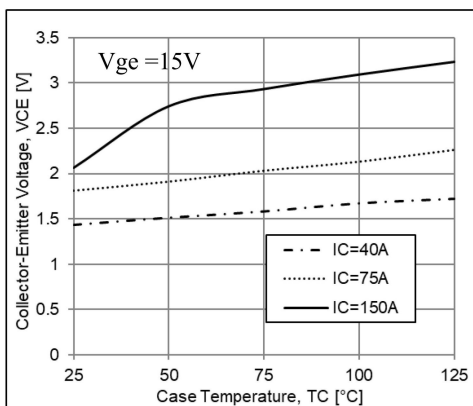


Typical Saturation Voltage Characteristics

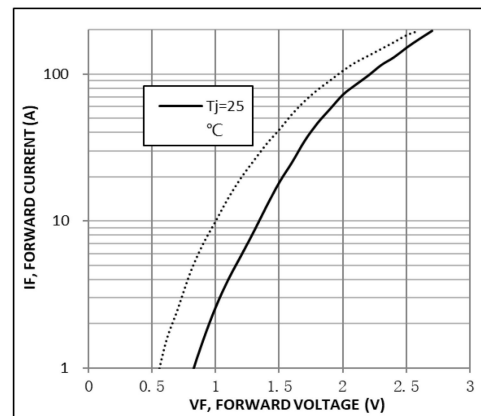
$V_G=15\text{V}$



Saturation Voltage vs. Case Temperature at Variant Current Level

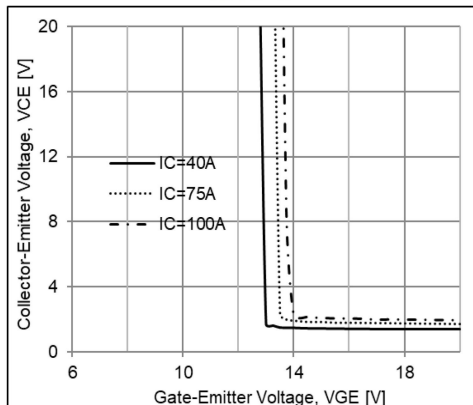


Forward Characteristics



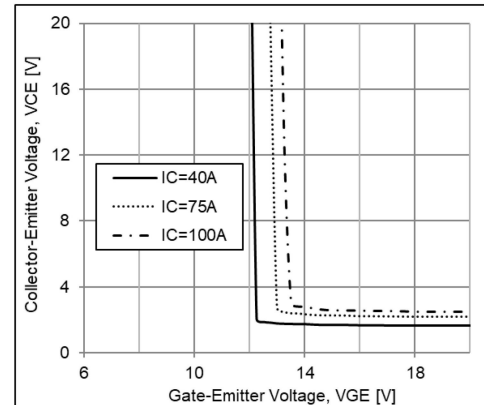
Saturation Voltage vs. VGE

$T_c=25^\circ\text{C}$

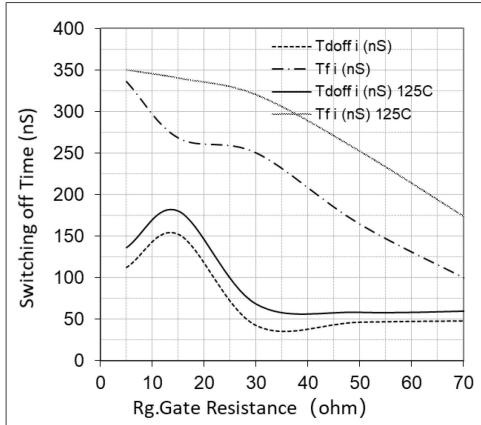


Saturation Voltage vs. VGE

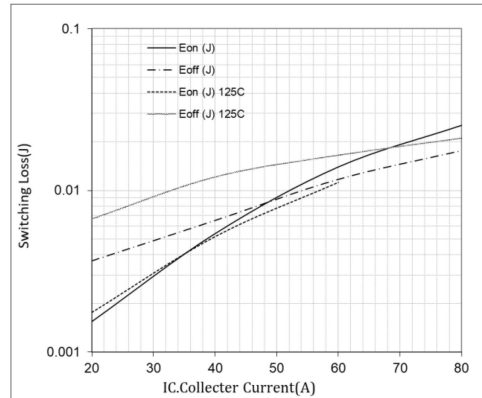
$T_c=25^\circ\text{C}$



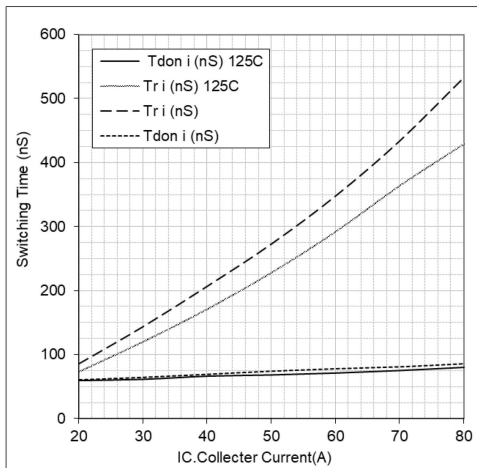
Turn-Off Characteristics vs. Gate Resistance
(VCC=600V, VGE=±15V, IC=75A)



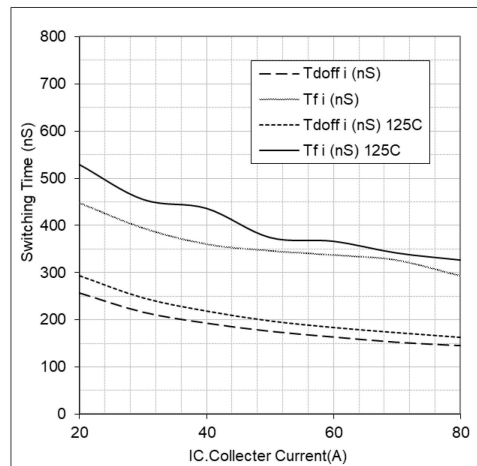
Switching Loss vs. Collector Current
(VGE=±15V, RG= 10 ohm, VCC=600V)



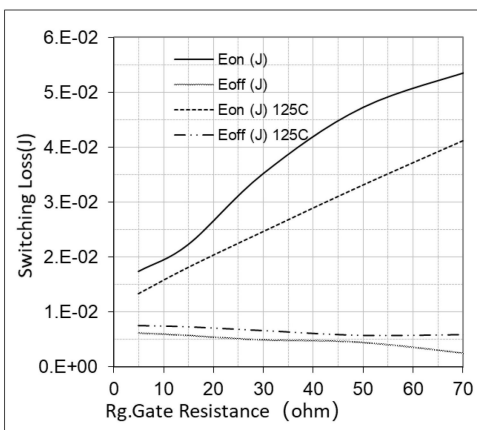
Turn-On Characteristics vs. Collector Current
(VGE=±15V, RG=5 OHM, VCC=600V)



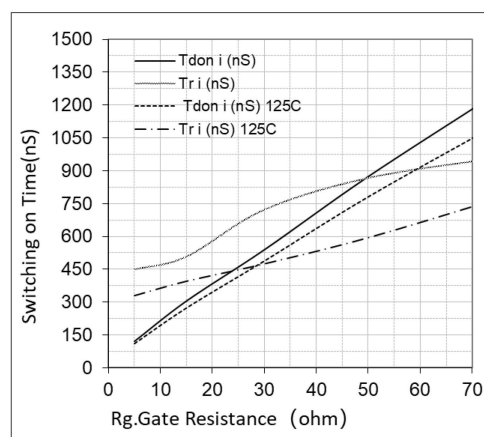
Turn-Off Characteristics vs. Collector Current
(VGE=±15V, RG=5 OHM, VCC=600V)



Switching Loss vs. Gate Resistance
(VCC=600V, VGE= ±15V, IC=75A,)

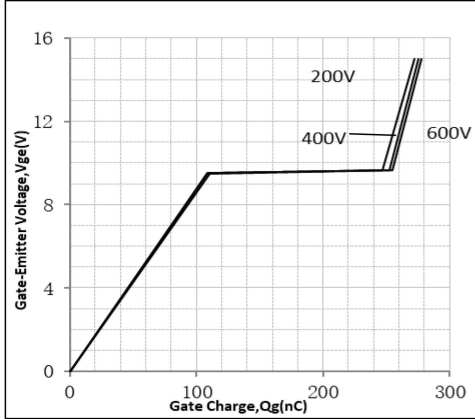


Turn-On Characteristics vs. Gate Resistance
(VCC=600V, VGE= ±15V, IC=75A)



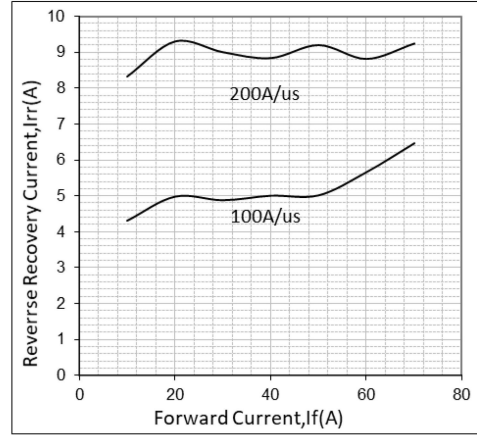
Gate Charge Characteristics

RL=10 ohm TC=25°C, Vcc=600, 400V 200V



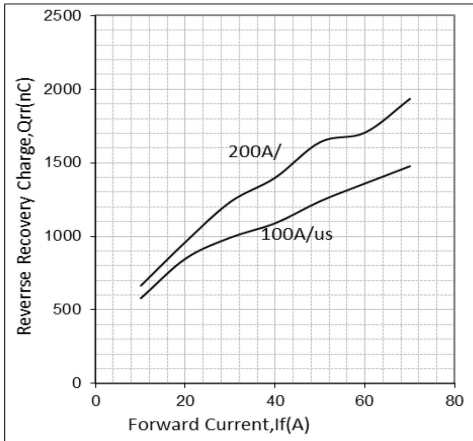
Reverse Recovery Current

VCC=400V, RG=10 ohm, VG=±15V IL=500uH



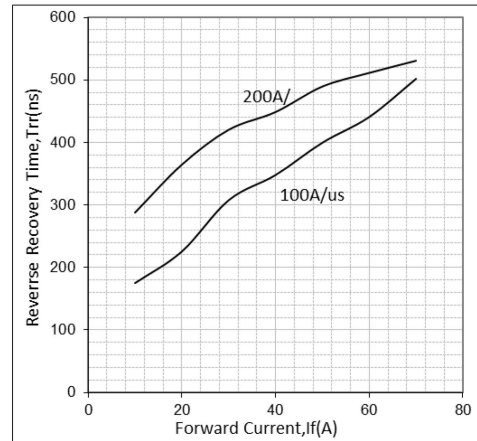
Stored Charge

VCC=600V, RG= 10 ohm, VG=±15V IL=500uH

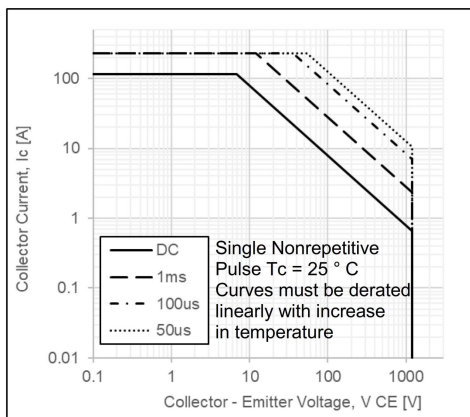


Reverse Recovery Time

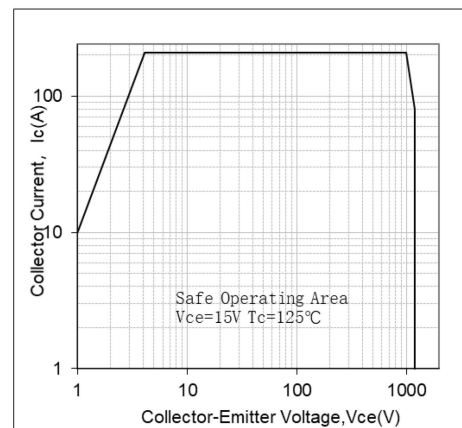
VCC=400V, RG=10 ohm, VG=±15V IL=500uH



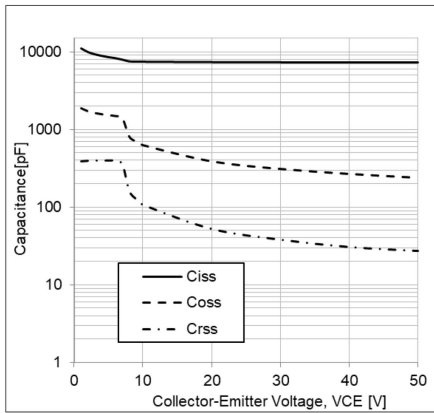
SOA Characteristics



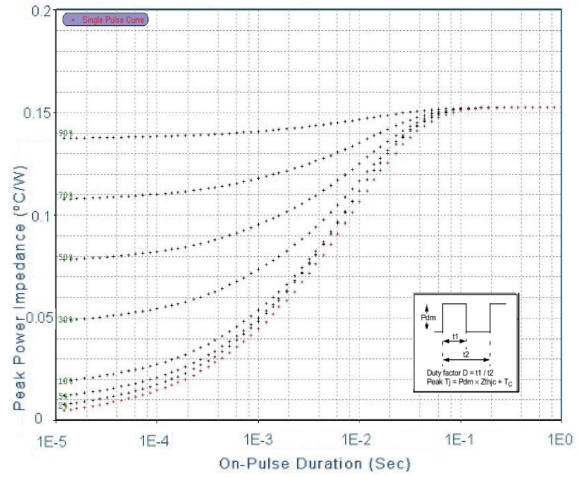
Turn Off SOA



Capacitance Characteristics



Transient Thermal Impedance of IGBT



Package Mechanical DATA

