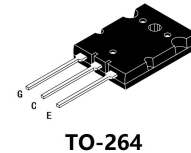
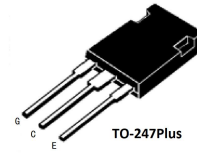


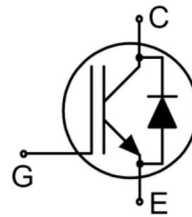
Features

- Very Low Saturation Voltage:
VCE(sat) = 1.65V @ IC = 100 A
- Maximum Junction Temperature: TJ = 175°C
- Positive Temperature Co-Efficient
- Tight Parameter Distribution
- High Input Impedance



Applications

- Traction Inverter for HEV/EV
- Auxiliary DC/AC Converter
- Motor Drives
- Other Power-Train Applications
Requiring High Power Switch



Absolute Ratings(Tc=25°C)

Parameter	Symbol	Value	Unit
Collector-Emmitter Voltage	V _{ce}	650	V
Collector Current-continuous	I _c T=25°C T=100°C	200	A
		100	A
Diode forward current	I _F T=25°C Tc=100°C	150	A
		75	A
Collector Current-pulse (note 1)	I _{CM}	300	A
Gate-EMMiter Voltage	V _{GES}	±20	V
Power Dissipation(TO-264)	PD	625	W
Power Dissipation(TO-247Plus)	PD	882	W
Operating and Storage Temperature Range	T _J , T _{STG}	-55~+150	°C
Short Circuit Withstand Time	t _{sc}	5	us
Maximum Lead Temperature for Soldering Purposes	T _L	300	°C

Electrical Characteristics

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Collector-Emmitter Voltage	BV_{CES}	$I_C=1.6mA, V_{GE}=0V$	650	-	-	V
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V, T_C=25^\circ C$	-	-	2	μA
Gate-body leakage current, forward	I_{GESF}	$V_{CE}=0V, V_{GE}=20V$	-	-	100	nA
Gate-body leakage current, reverse	I_{GESR}	$V_{CE}=0V, V_{GE}=-20V$	-	-	-100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_C=0.6mA$	3.5	5.0	6.5	V
Collector-Emmitter saturation Voltage	V_{CESAT}	$V_{GE}=15V, I_C=100A$	-	-	1.65	V
Dynamic Characteristics						
Input capacitance	C_{ies}	$V_{CE}=30V, V_{GE}=0V, f=1.0MHz$	-	5012	-	pF
Output capacitance	C_{oes}		-	430	-	pF
Reverse transfer capacitance	C_{res}		-	100	-	pF

Electrical Characteristics

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{CC}=400V, I_C=100A, R_G=4.7\Omega, V_{GE}=15V, \text{Inductive Load}$ $T_C=25^\circ C$	-	84	-	ns
Turn-On rise time	t_r		-	147	-	ns
Turn-Off delay time	$t_{d(off)}$		-	216	-	ns
Turn-Off Fall time	t_f		-	133	-	ns
Turn-on Loss	E_{on}		-	5.4	-	mJ
Turn-off Loss	E_{off}		-	3.8	-	mJ
Total Loss	E_{ts}		-	9.2	-	mJ
Turn-on delay time	$t_{d(on)}$	$V_{CC}=400V, I_C=100A, R_G=4.7\Omega, V_{GE}=15V, \text{Inductive Load}$ $T_C=175^\circ C$	-	80	-	ns
Turn-On rise time	t_r		-	160	-	ns
Turn-Off delay time	$t_{d(off)}$		-	244	-	ns
Turn-Off Fall time	t_f		-	166	-	ns

Turn-on switching Loss	E_{on}	$V_{CC}=400V, I_C=100A$ $V_{GE}=15V$	-	9.7	-	mJ
Turn-off switching Loss	E_{off}		-	5.2	-	mJ
Total switching Loss	E_{ts}		-	14.9	-	mJ
Gate Charge	Q_g		-	157	-	nC
Gate to Emitter Charge	Q_{ge}		-	43	-	nC
Gate to Collector Charge	Q_{gc}		-	64	-	nC
Anti-Parallel Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_F	$I_F=75A(T_J=25^\circ C)$	-	1.6	-	V
Diode Reverse recovery time	t_{rr}	$I_F=75A$ $di_F/dt=200A/us$ $T_J=25^\circ C$	-	62	-	ns
Diode Reverse recovery charge	Q_{rr}		-	164	-	nC

Thermal Characteristic

Parameter	Symbol	Max	Unit
Thermal Resistance, Junction to Case (IGBT)	$R_{th(j-c)}$	0.2	$^\circ C/W$
Thermal Resistance, Junction to Case (Diode)	$R_{th(j-c)}$	0.4	$^\circ C/W$
Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	25	$^\circ C/W$

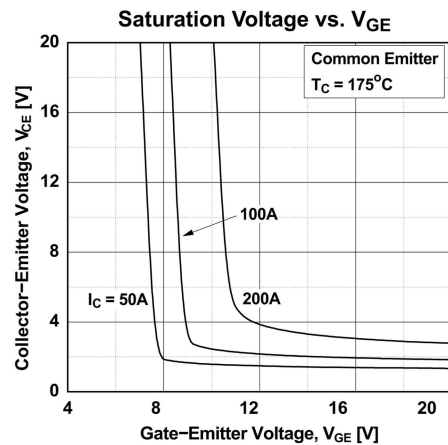
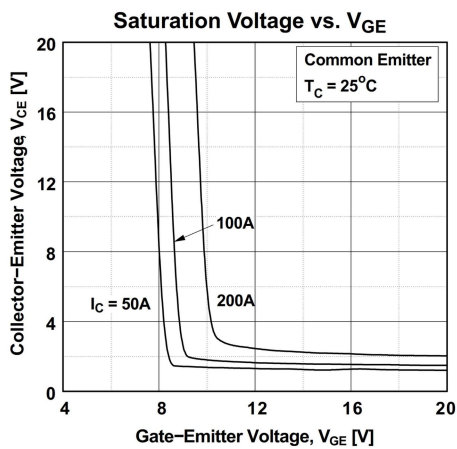
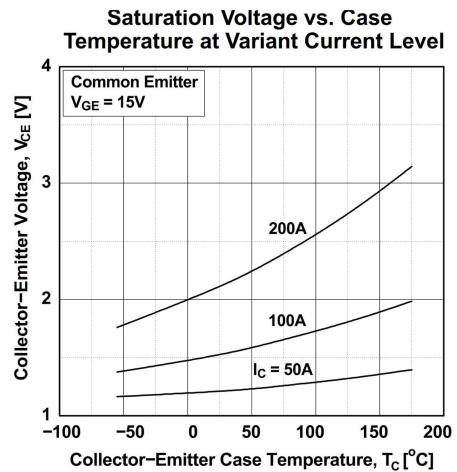
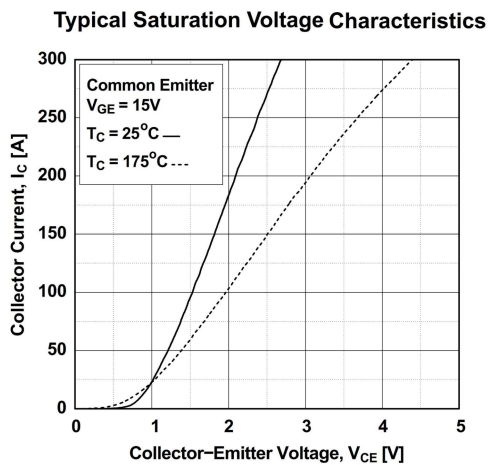
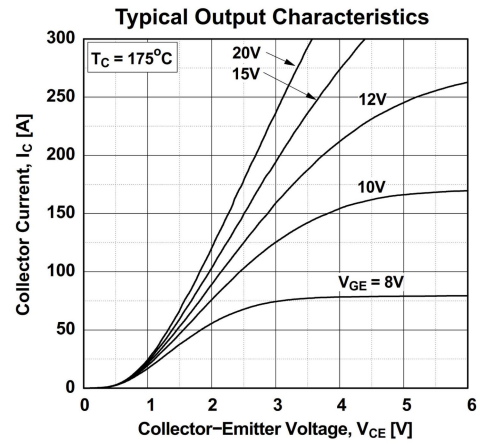
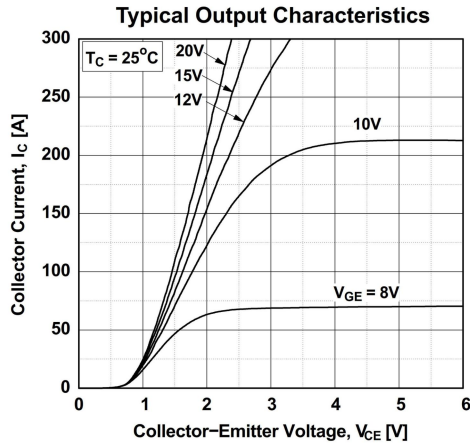
Notes:

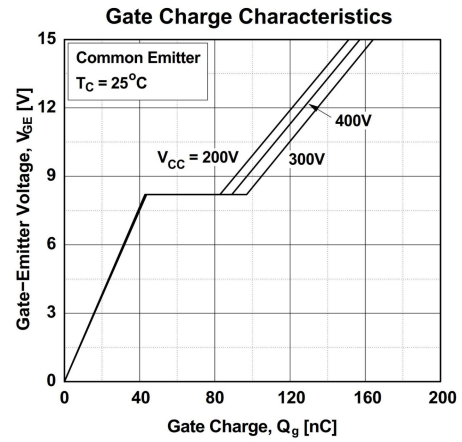
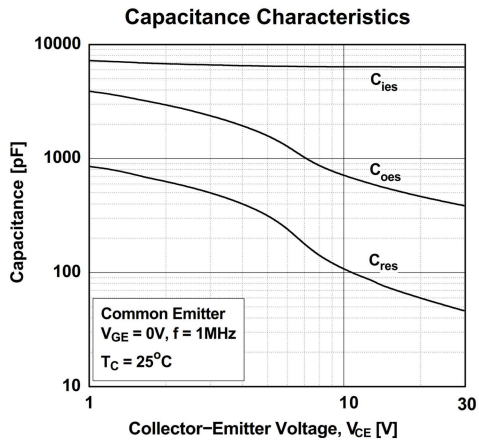
1. Repetitive Rating: Pulse width limited by maximum junction temperature

Order Information

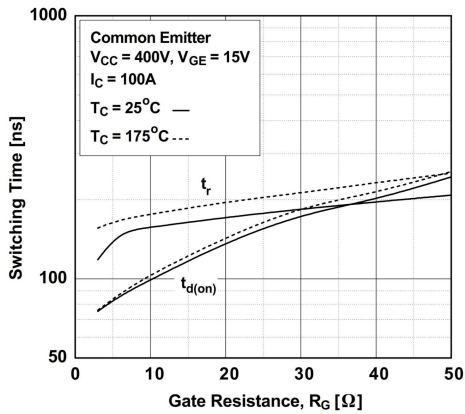
type specification	packaging
MSG100T65HLB3	TO-264
MSG100T65HLC1	TO-247Plus

Electrical Characteristics (curves)

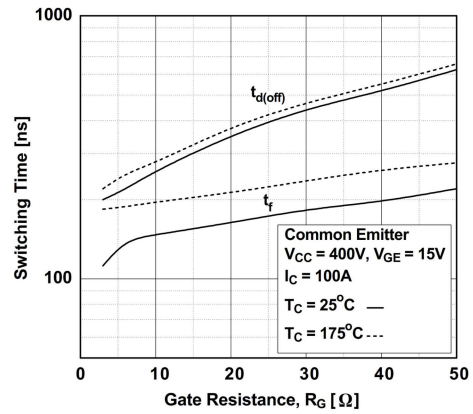




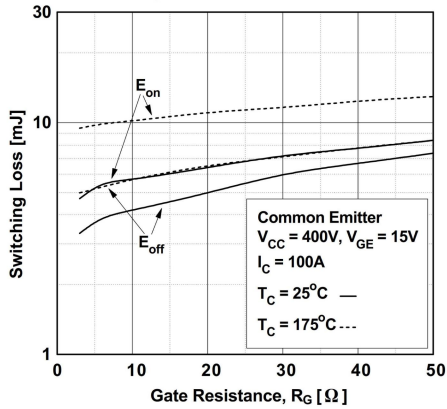
Turn-on Characteristics vs. Gate Resistance



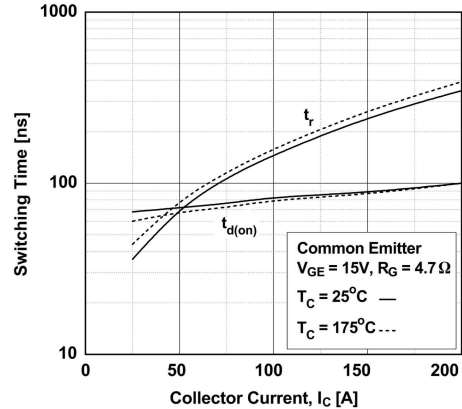
Turn-off Characteristics vs. Gate Resistance



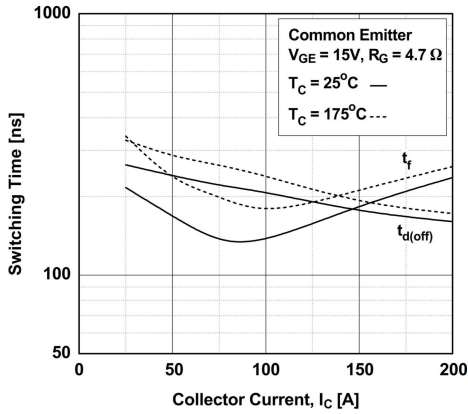
Switching Loss vs. Gate Resistance



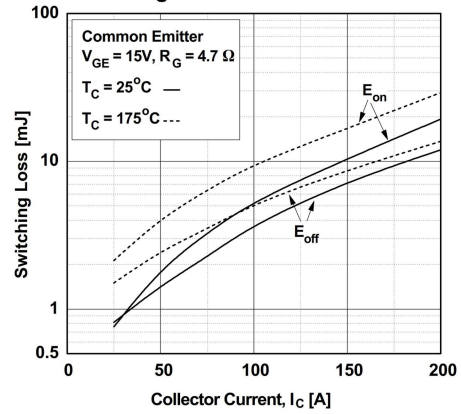
Turn-on Characteristics vs. Collector Current



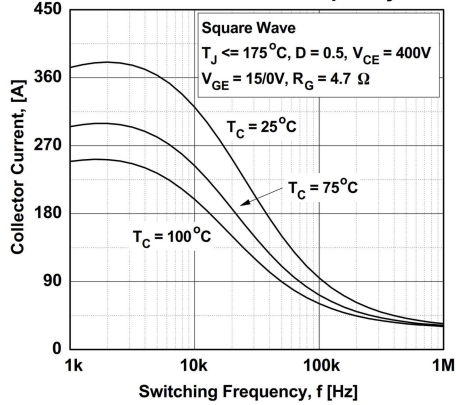
Turn-off Characteristics vs. Collector Current



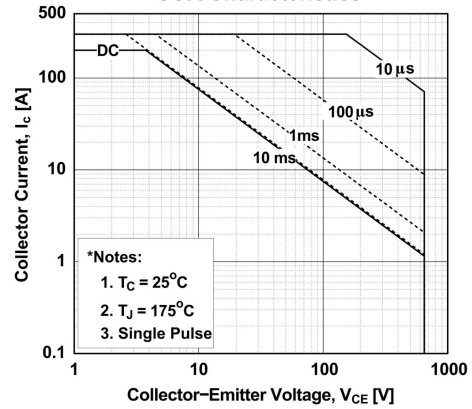
Switching Loss vs. Collector Current



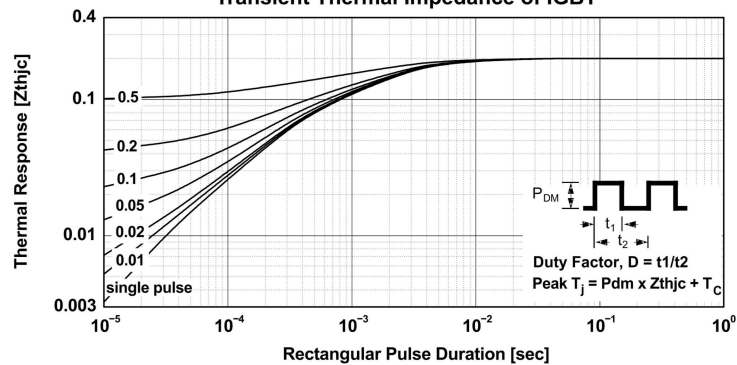
Load Current vs. Frequency



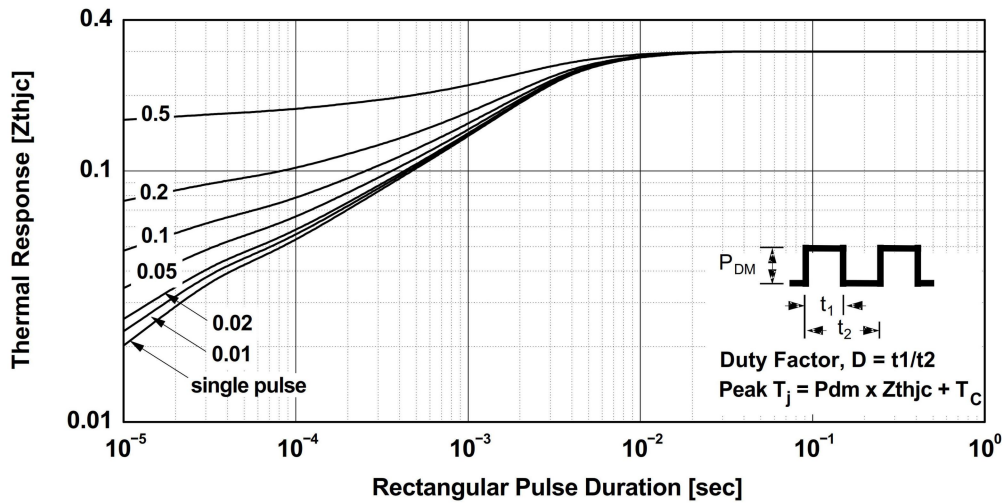
SOA Characteristics



Transient Thermal Impedance of IGBT



Transient Thermal Impedance of Diode



Package Mechanical DATA

