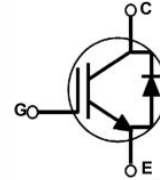
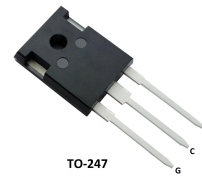


Features

- High Current Capability
- Low Saturation Voltage:
 $V_{CE(sat)} = 1.3V @ I_C = 50 A$
- High Input Impedance
- RoHS Compliant



Applications

- PDP TV

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit	
Collector to Emitter Voltage	V_{CES}	330	V	
Gate to Emitter Voltage	V_{GES}	± 30		
Collector Current	I_C	$T_C=25^\circ C$	180	A
		$T_C=100^\circ C$	80	
Pulsed Collector Current $T_C=25^\circ C$	I_{CM}	450		
Diode forward current @ $T_C= 80^\circ C$	I_F	80	A	
Maximum Power Dissipation $T_C=25^\circ C$	P_D	420	W	
Maximum Power Dissipation $T_C=100^\circ C$		180		
Operating Junction Temperature	T_J	-55 to 150	$^\circ C$	
Storage Temperature Range	T_{stg}	-55 to 150		
Maximum Lead Temp. for soldering Purposes, 1/8" from case for 5 seconds	T_L	300		

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}(IGBT)$		0.3	$^\circ C/W$
Thermal Resistance, Junction to Case	$R_{\theta JC}(Diode)$		0.8	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$		35	

Package Marking and Ordering Information

Device Marking	Device	Package	MOQ
MSG80N350HLC0	MSG80N350HLC0	TO-247	

Electrical Characteristics of the IGBT $T_C = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
On/off Characteristics						
G-E Threshold Voltag	$V_{GE(th)}$	$I_C = 250\mu\text{A}, V_{CE} = V_{GE}$	2.5	4	5.5	V
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 50\text{A}, V_{GE} = 15\text{V}$	-	1.3	1.6	
Collector to Emitter Breakdown Voltage	B_{VCE}	$V_{GE} = 0\text{V}, I_C = 400\mu$	330	-	-	
Collector Cut-Off Curren	I_{CE}	$V_{CE} = V_{CES}, V_{GE} = 0$	-	-	400	μA
G-E Leakage Curren	I_{GE}	$V_{GE} = V_{GES}, V_{CE} = 0\text{V}$	-	-	± 400	nA
Dynamic Characteristics						
Input Capacitance	C_{ies}	$V_{CE} = 30\text{V}, V_{GE} = 0\text{V}$ $f = 1\text{MHz}$	-	3900	-	pF
Output Capacitance	C_{oes}		-	320	-	
Reverse Transfer Capacitance	C_{res}		-	200	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{CC} = 200\text{V}, I_C = 40\text{A},$ $R_G = 5\Omega, V_{GE} = 15\text{V},$ Resistive Load, $T_C = 25^\circ\text{C}$	-	27	-	nS
Rise Tim	t_r		-	80	-	
Turn-Off Delay Tim	$t_{d(off)}$		-	108	-	
Fall Time	t_f		-	180	240	
Turn-On Delay Time	$t_{d(on)}$	$V_{CC} = 200\text{V}, I_C = 40\text{A},$ $R_G = 5\Omega, V_{GE} = 15\text{V},$ Resistive Load, $T_C = 125^\circ\text{C}$	-	26	-	
Rise Time	t_r		-	75	-	
Turn-Off Delay Tim	$t_{d(off)}$		-	112	-	
Fall Time	t_f		-	250	300	
Total Gate Charge	Q_g	$V_{CE} = 200\text{V}, I_C = 40\text{A},$ $V_{GE} = 15\text{V}$	-	169	-	nC
Gate to Emitter Charg	Q_{ge}		-	22	-	
Gate to Collector Charg	Q_{gc}		-	69	-	

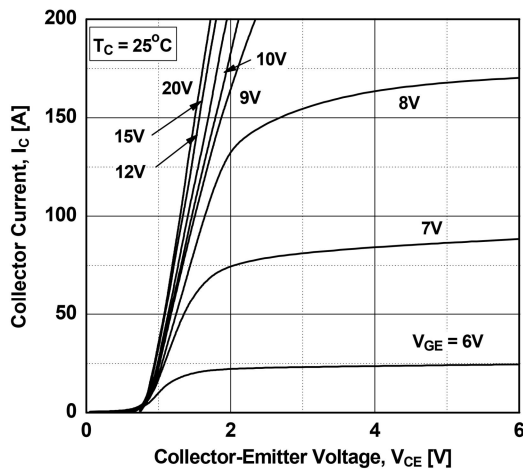
Electrical Characteristics of the Diode $T_C = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Diode Forward Voltage	V_{FM}	$I_F = 50\text{A}$	$T_C = 25^\circ\text{C}$	-	1.35	1.5	V
			$T_C = 125^\circ\text{C}$	-	1	-	
Diode Reverse Recovery Time	t_{rr}	$I_F = 50\text{A},$ $di_F/dt = 200\text{A}/\mu\text{s}$	$T_C = 25^\circ\text{C}$	-	33	-	ns
			$T_C = 125^\circ\text{C}$	-	50	-	
Diode Peak Reverse	I_{rr}	$T_C = 25^\circ\text{C}$	-	4	-	A	

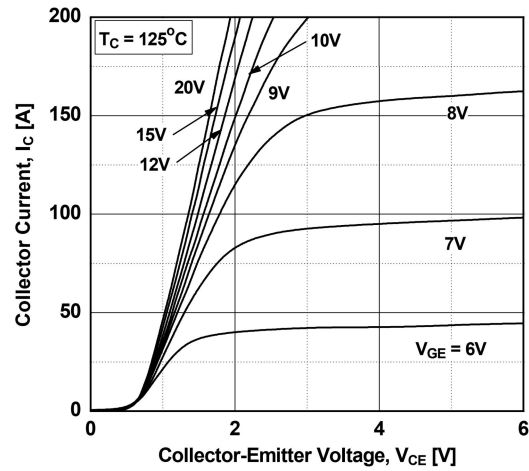
Recovery Current		$T_C=125^\circ\text{C}$	-	6	-	
Diode Reverse Recovery Charge	Q_{rr}	$T_C=25^\circ\text{C}$	-	50	-	nC
		$T_C=125^\circ\text{C}$	-	120	-	

Typical Performance Characteristics

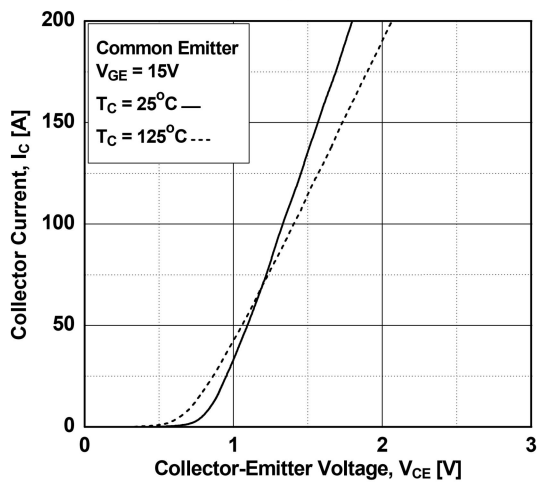
Typical Output Characteristics



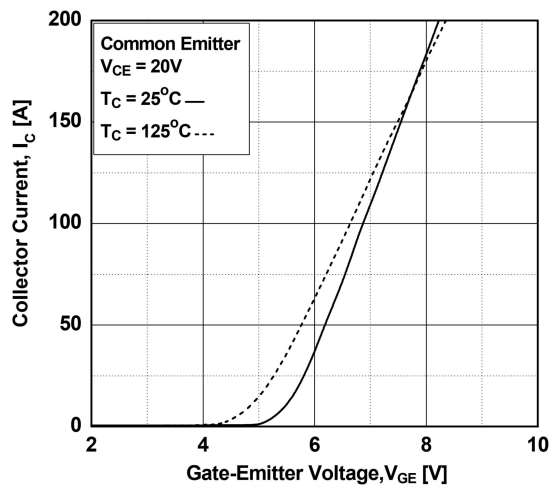
Typical Output Characteristics



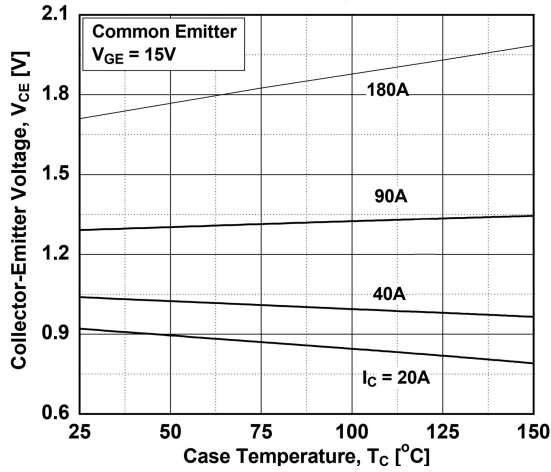
Typical Saturation Voltage Characteristics



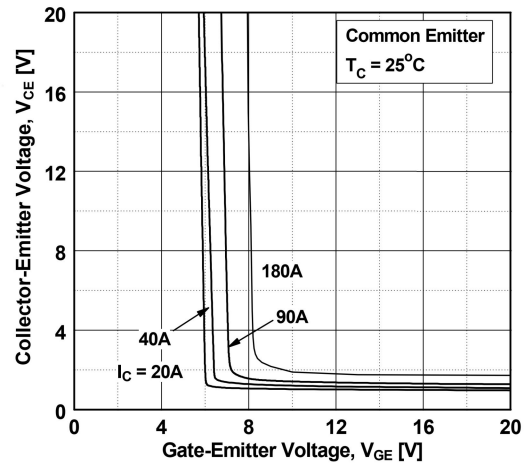
Transfer Characteristics



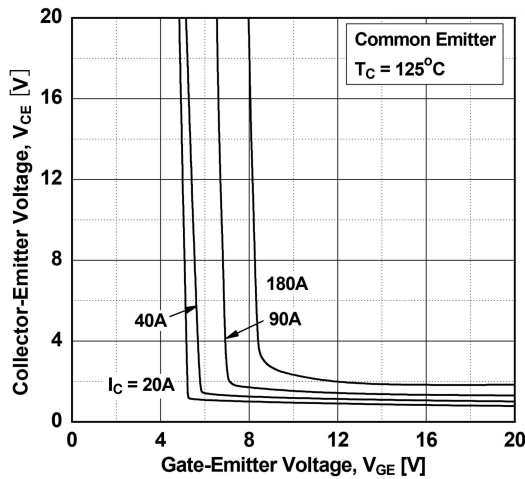
Saturation Voltage vs. Case Temperature at Variant Current Level



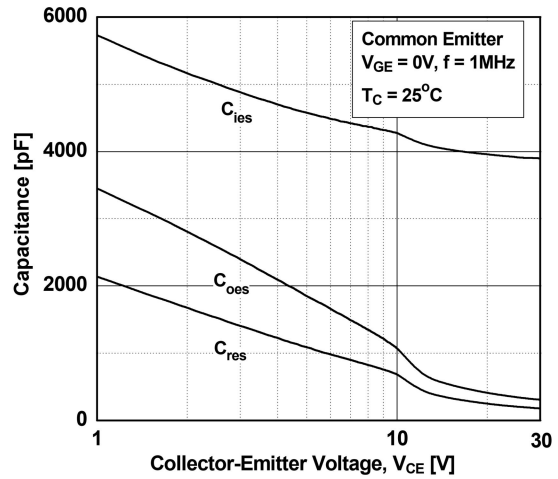
Saturation Voltage vs. V_{GE}



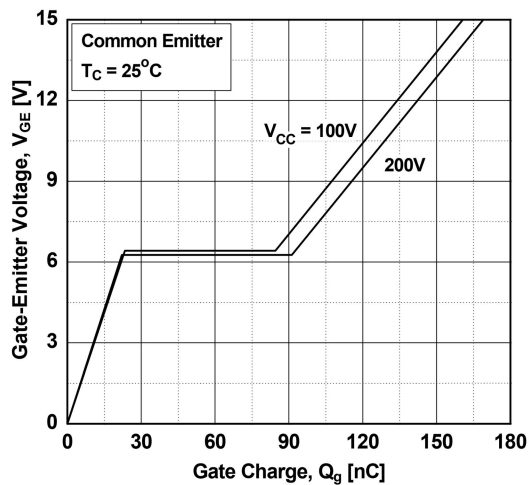
Saturation Voltage vs. V_{GE}



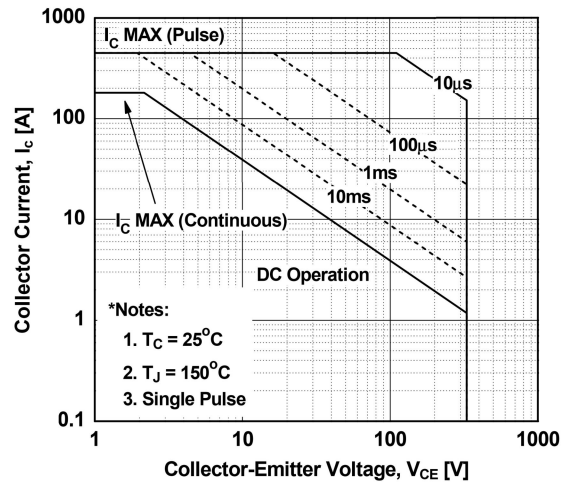
Capacitance Characteristics



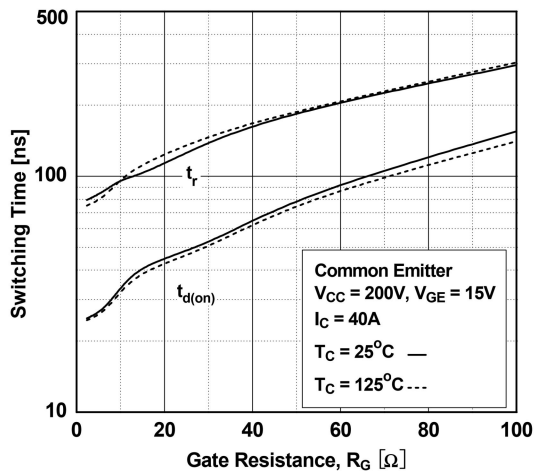
Gate charge Characteristics



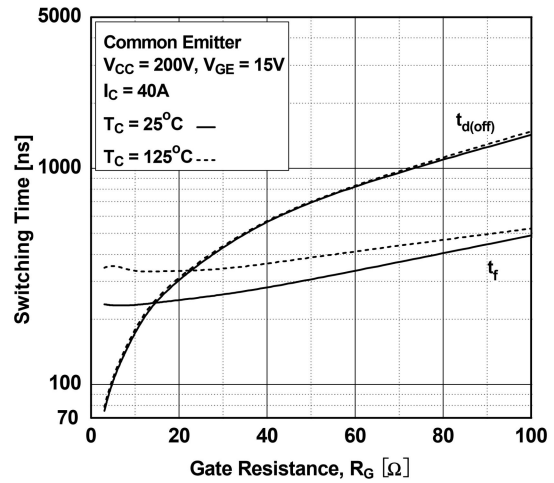
SOA Characteristics



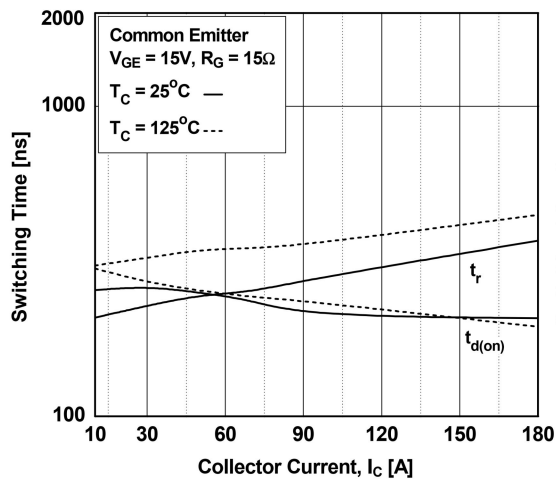
Turn-on Characteristics vs. Gate Resistance



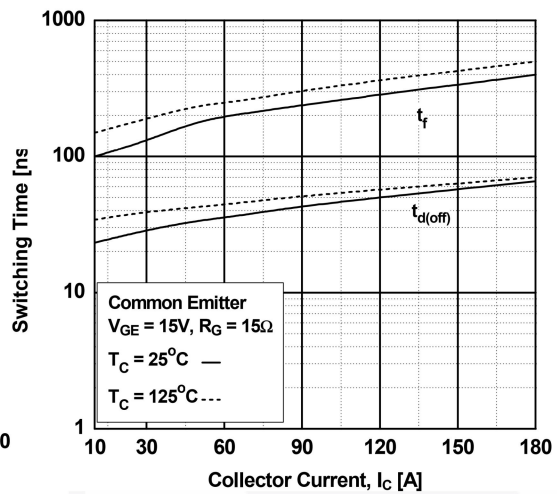
Turn-off Characteristics vs Gate Resistance



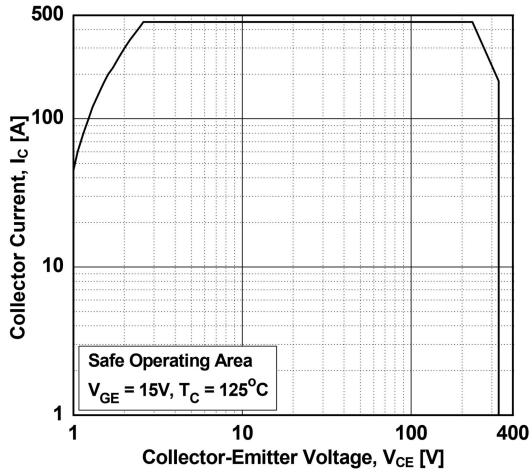
Turn-on Characteristics vs. Collector Current



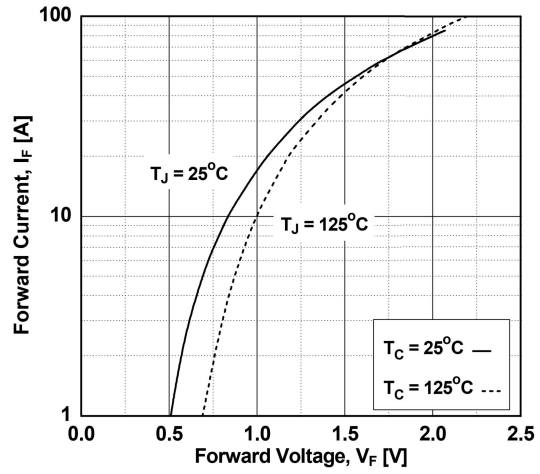
Turn-off Characteristics v Collector Current



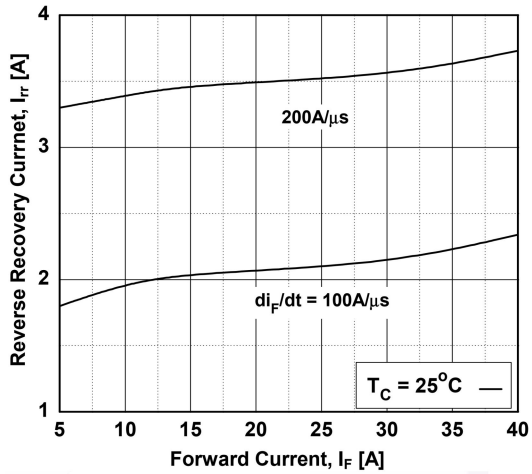
Turn off Switching SOA Characteristics



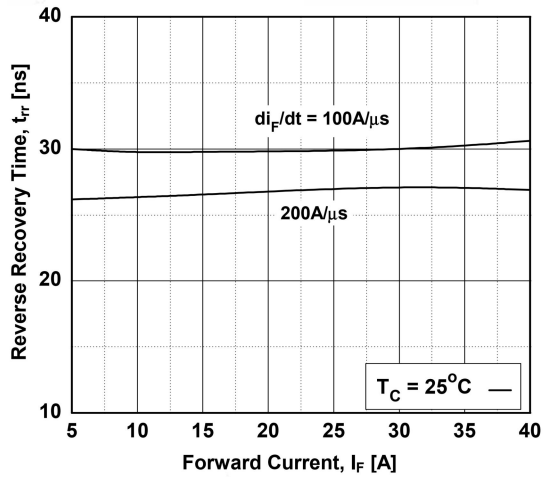
Forward Characteristics



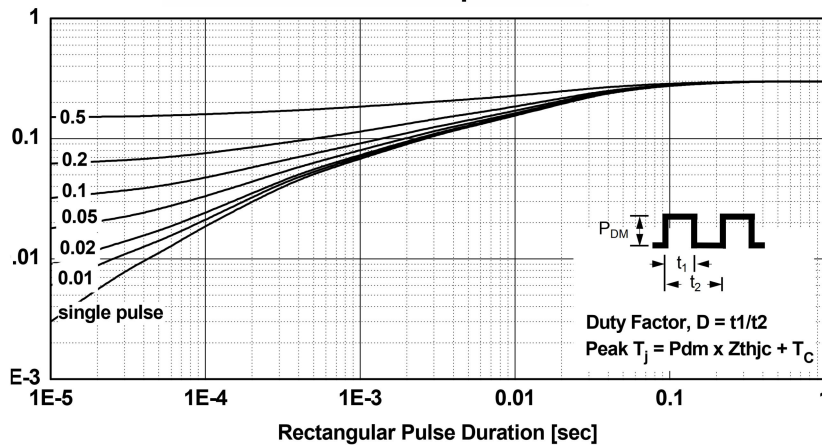
Reverse Recovery Current



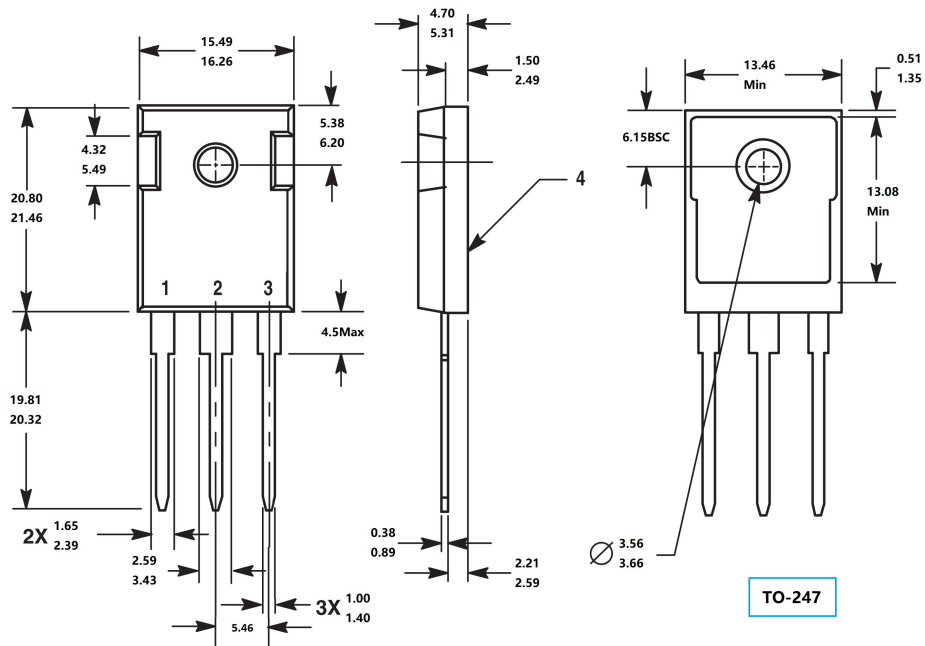
Reverse Recovery Time



Transient Thermal Impedance of IGBT



Package outline dimension



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