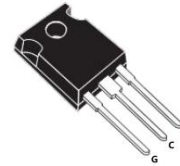


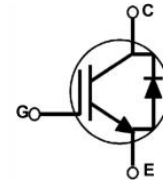
Features

- High Current Capability
- Low Saturation Voltage:
 $V_{CE(sat)} = 1.30 \text{ V @ } I_C = 50 \text{ A}$
- High Input Impedance
- RoHS Complaint



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	$T_C=25^{\circ}C$	I_C	100	A
	$T_C=100^{\circ}C$		50	
Pulsed Collector Current $TC=25^{\circ}C$		I_{CM}	180	
Diode forward current @ $TC= 100^{\circ}C$		I_F	30	A
Maximum Power Dissipation $TC=25^{\circ}C$		P_D	328	W
Maximum Power Dissipation $TC=100^{\circ}C$			130	
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	$R_{\theta JC}(\text{IGBT})$		0.38	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}(\text{Diode})$		1.1	

Package Marking and Ordering Information

Device Marking	Device	Package	MOQ
MSG50N350FH	MSG50N350FH	TO-247	

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

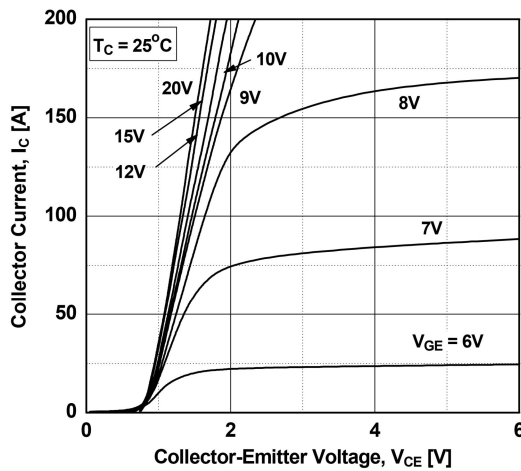
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
On/off Characteristics						
G-E Threshold Voltage	V _{GE(th)}	I _C = 600uA, V _{CE} = V _{GE}	3.3	4.7	6	V
Collector to Emitter Saturation Voltage	V _{CE(sat)}	I _C = 30A, V _{GE} = 15V	-	1.15	-	
		I _C = 50A, V _{GE} = 15V	-	1.30	-	
		I _C = 50A, V _{GE} = 15V T _C = 125°C	-	1.52	-	
Collector to Emitter Breakdown Voltage	B _{VCE}	V _{GE} = 0V, I _C = 100μA	330	-	-	
Collector Cut-Off Current	I _{CE}	V _{CE} = V _{CES} , V _{GE} = 0	-	-	100	μA
G-E Leakage Current	I _{GE}	V _{GE} = V _{GES} , V _{CE} = 0V	-	-	±1	nA
Dynamic Characteristics						
Input Capacitance	C _{ies}	V _{CE} = 30V, V _{GE} = 0V f = 1MHz	-	4700	-	pF
Output Capacitance	C _{oes}		-	198	-	
Reverse Transfer Capacitance	C _{res}		-	83	-	
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{CC} = 200V, I _C = 40A, R _G = 5Ω, V _{GE} = 15V, Resistive Load, T _C = 25°C	-	63	-	nS
Rise Tim	t _r		-	81	-	
Turn-Off Delay Time	t _{d(off)}		-	142	-	
Total Gate Charge	Q _g	V _{CE} = 200V, I _C = 40A, V _{GE} = 15V	-	175	-	nC

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

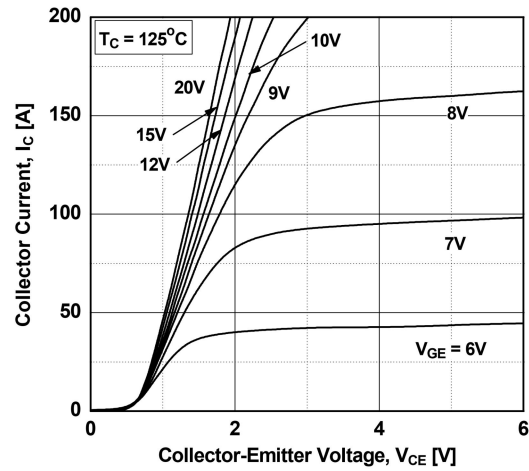
Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Diode Forward Voltage	V _{FM}	I _F = 15A	T _C =25℃	-	0.93	1.4	V
			T _C =125℃	-	1	-	
Diode Reverse Recovery Time	t _{rr}	I _F =20A, di _F /dt = 200A/μs	T _C =25℃	-	35	-	ns
			T _C =125℃	-	53	-	
Diode Peak Reverse Recovery Current	I _{rr}		T _C =25℃	-	4	-	A
			T _C =125℃	-	6	-	
Diode Reverse Recovery Charge	Q _{rr}		T _C =25℃	-	50	-	nC
			T _C =125℃	-	120	-	

Typical Performance Characteristics

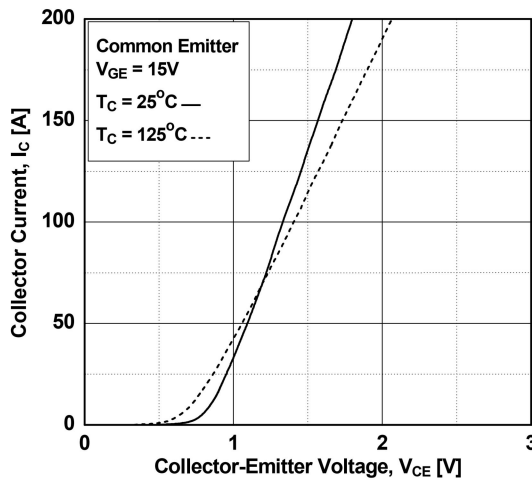
Typical Output Characteristics



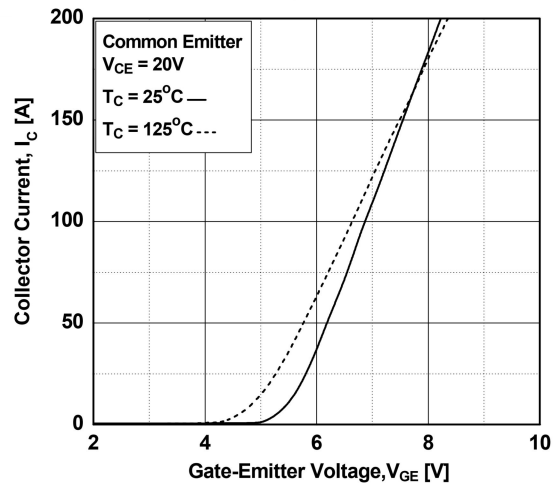
Typical Output Characteristics



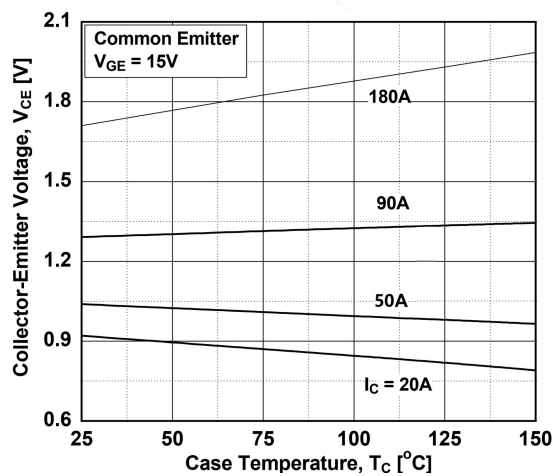
Typical Saturation Voltage Characteristics



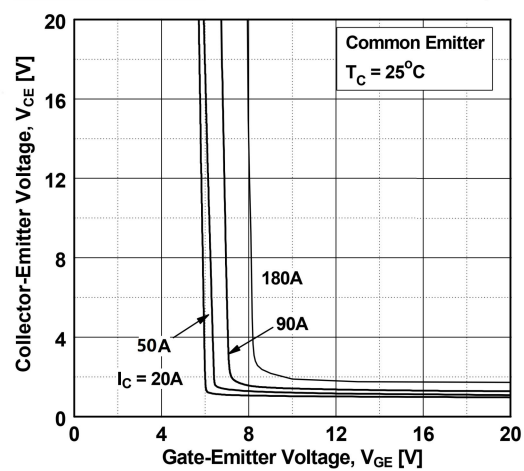
Transfer Characteristics



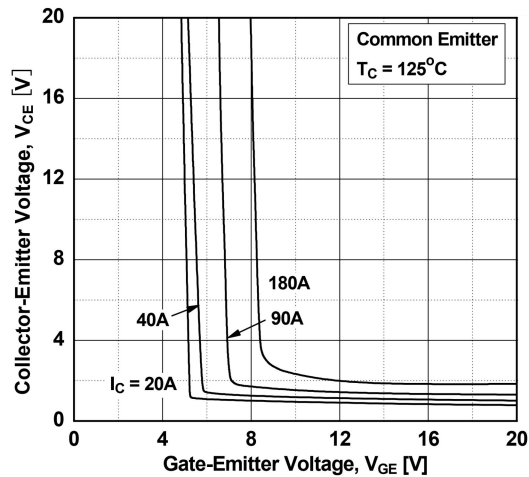
Saturation Voltage vs. Case Temperature at Variant Current Level



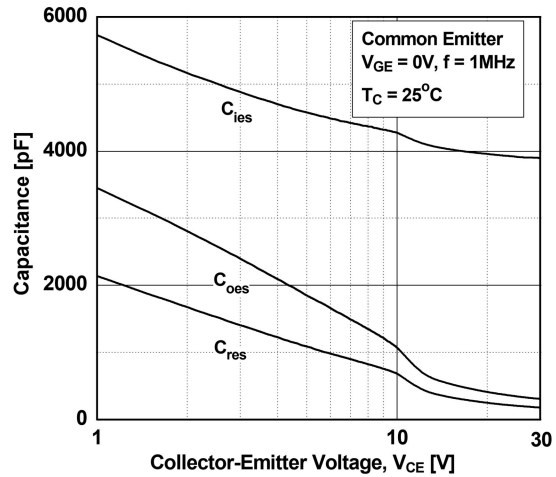
Saturation Voltage vs. V_{GE}



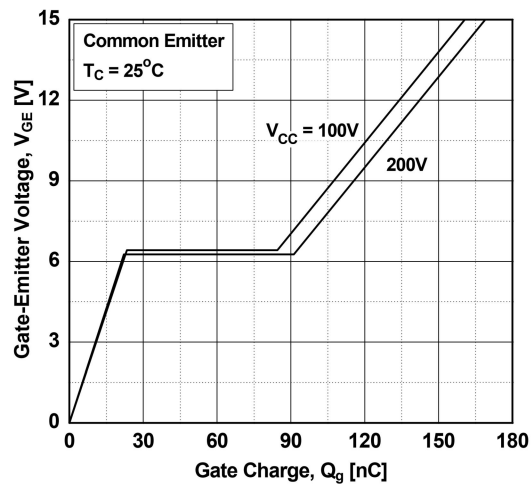
Saturation Voltage vs. V_{GE}



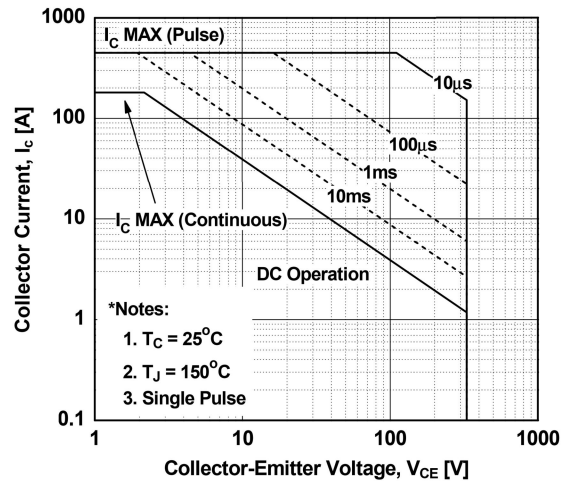
Capacitance Characteristics



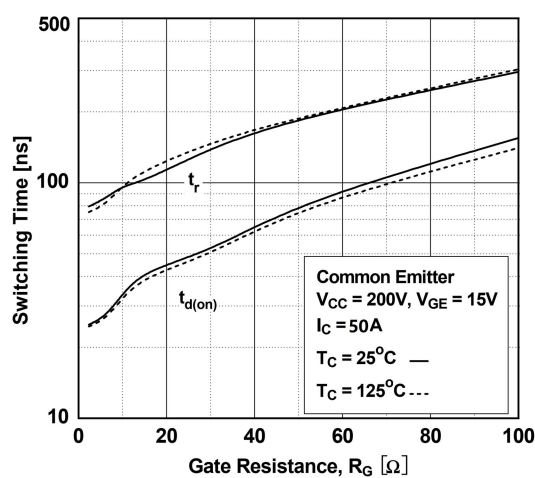
Gate charge Characteristics



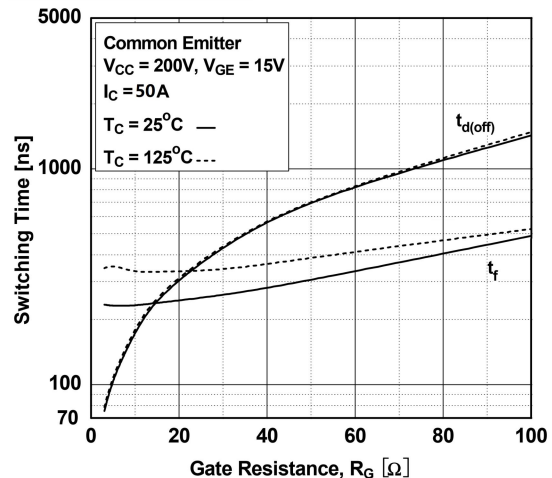
SOA Characteristics



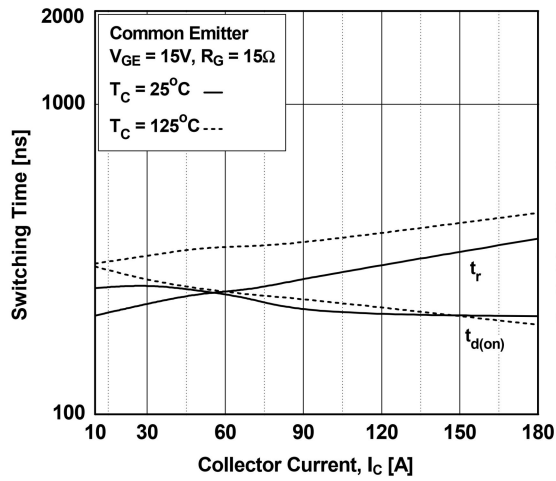
Turn-on Characteristics vs. Gate Resistance



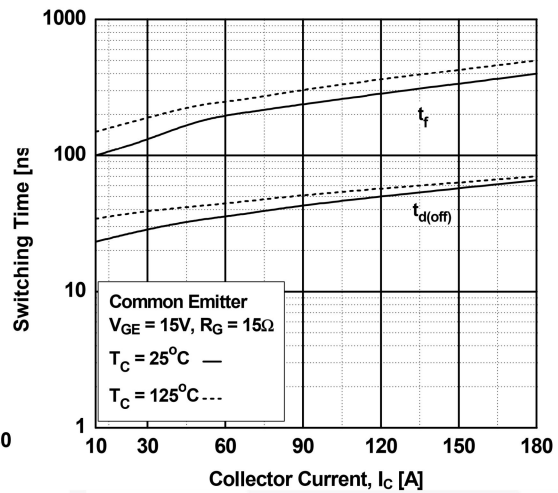
Turn-off Characteristics vs. Gate Resistance



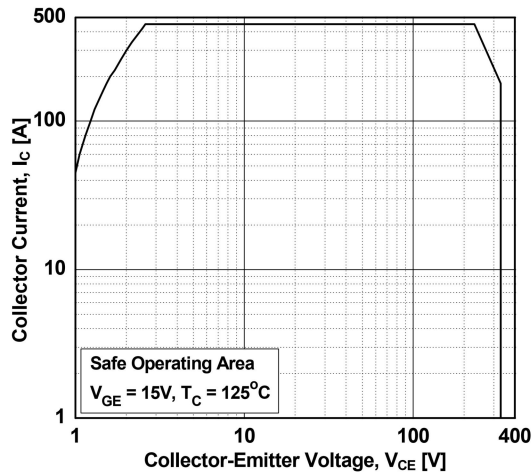
Turn-on Characteristics vs. Collector Current



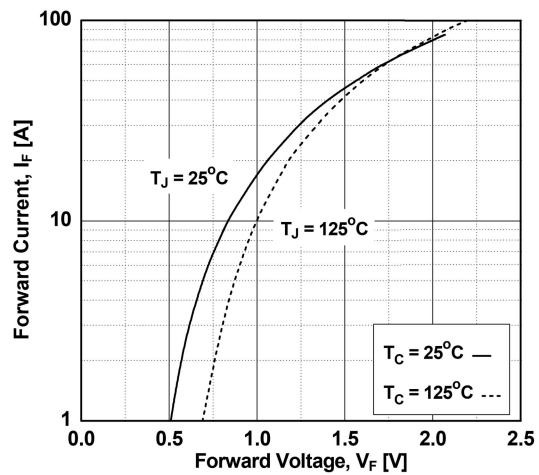
Turn-off Characteristics v Collector Current



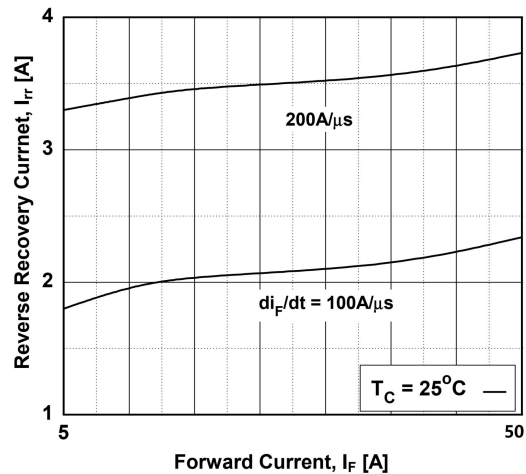
Turn off Switching SOA Characteristics



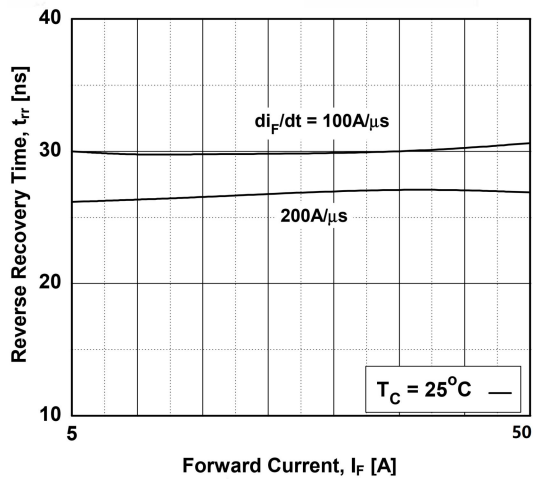
Forward Characteristics



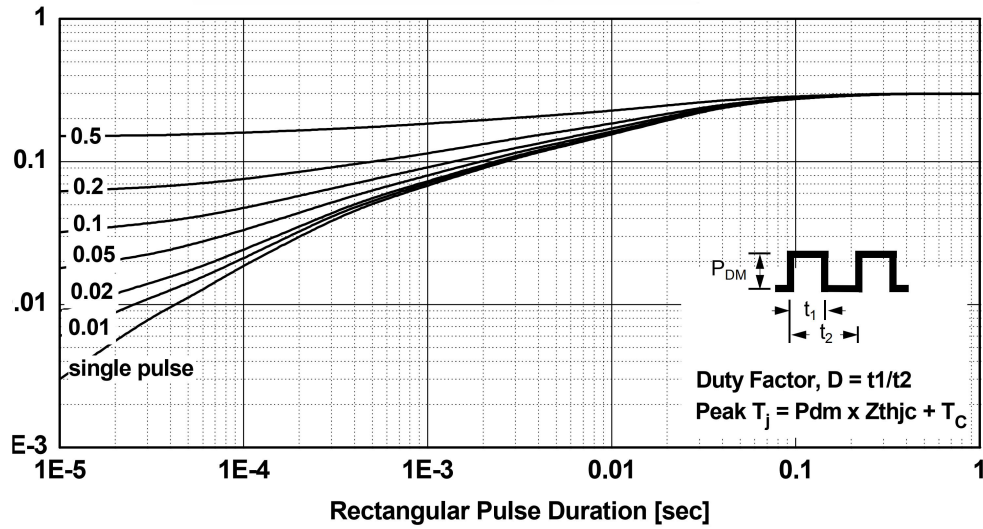
Reverse Recovery Current



Reverse Recovery Time



Transient Thermal Impedance of IGBT



Package outline dimension

