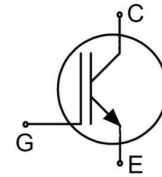


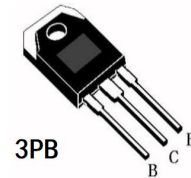
Features

- High Gate Charge
- Trench FS Technology
- Low Saturation Voltage:
VCE(sat) = 1.5V @ IC = 30 A
- RoHS Compliant



Applications

- General Purpose inverters
- ups



Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Collector to Emitter Voltage		V_{CES}	1200	V
Gate to Emitter Voltage		V_{GES}	±20	
Collector Current	$T_C=25^\circ\text{C}$	I_C	60	A
	$T_C=100^\circ\text{C}$		30	
Pulsed Collector Current $TC=25^\circ\text{C}$		I_{CM}	120	
Maximum Power Dissipation $TC=25^\circ\text{C}$		P_D	342	W
Operating Junction Temperature		T_J	-55 to 150	°C
Storage Temperature Range		T_{stg}	-55 to 175	
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	$R_{\theta JC}$		0.439	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$		31.87	

Package Marking and Ordering Information

Device Marking	Device	Package	MOQ
MSG30D120FLB	MSG30D120FLB	TO-3PB	

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

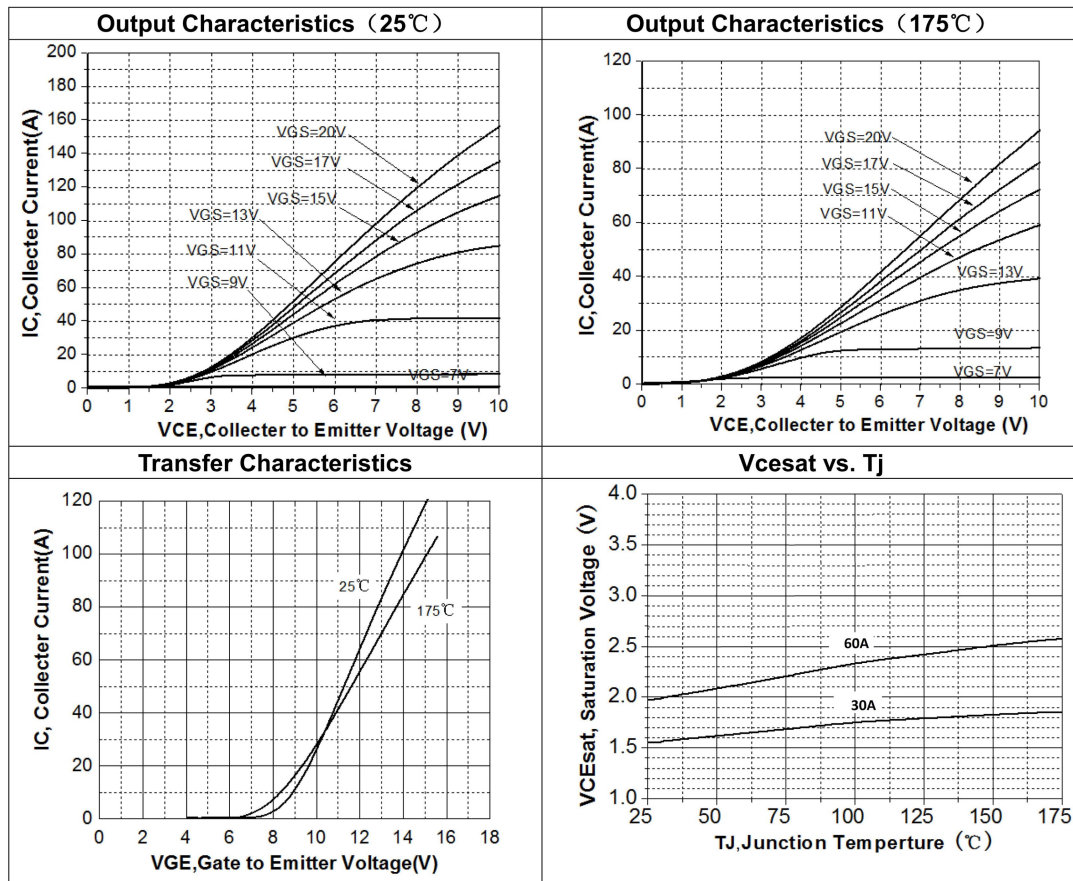
Parameter	Symbol	Test Conditions	Min	Type	Max	Unit
On/off Characteristics						
Collector to Emitter Breakdown Voltage	BV_{CE}	$V_{GE} = 0V, I_C = 250\mu A$	1200	-	-	V
Break down Voltage Temperature Coefficient	$\frac{\Delta BV_{CES}}{\Delta T_J}$	$I_C = 0.5mA, \text{referenced}$	-	0.6	-	$V/^\circ C$
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE} = 1200V, V_{GE} = 0V, T_C = 25^\circ C$	-	-	0.2	mA
G-E Threshold Voltage	$V_{GE(th)}$	$I_C = 250\mu A, V_{CE} = V_{GE}$	4.5		6.5	V
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 30A, V_{GE} = 15V$	-	1.5	2.3	
Collector Cut-Off Current	I_{CES}	$V_{CE} = V_{CES}, V_{GE} = 0$	-	-	200	nA
G-E Leakage Current	I_{GES}	$V_{GE} = V_{GES}, V_{CE} = 0V$	-	-	-200	nA
Dynamic Characteristics						
Input Capacitance	C_{ies}	$V_{CE} = 25V, V_{GE} = 0V$ $f = 1MHz$	-	3086	-	pF
Output Capacitance	C_{oes}		-	126	-	
Reverse Transfer Capacitance	C_{res}		-	42.2	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{CC} = 600V, I_C = 30A, R_G = 10\Omega, V_{GE} = 15V,$ Parasitic ductance = $75nH, T_C = 25^\circ C$	-	32	-	nS
Rise Tim	t_r		-	69	-	
Turn-Off Delay Tim	$t_{d(off)}$		-	121	-	
Fall Time	t_f		-	151	-	
Turn-on switching energy	E_{on}	$V_{CC} = 600V, I_C = 30A, R_G = 10\Omega, V_{GE} = 15V,$ Parasitic ductance = $75nH, T_C = 25^\circ C$		1.06		mJ
Turn-off switching energy	E_{off}			1.20		
Total switching energy	E_{tot}			2.26		
Turn-On Delay Time	$t_{d(on)}$	$V_{CC} = 600V, I_C = 30A, R_G = 10\Omega, V_{GE} = 15V,$ Parasitic ductance = $75nH, T_C = 25^\circ C$	-	29	-	nS
Rise Tim	t_r		-	71	-	
Turn-Off Delay Tim	$t_{d(off)}$		-	164	-	
Fall Time	t_f		-	335	-	
Turn-on switching energy	E_{on}	$V_{CC} = 600V, I_C = 30A, R_G = 10\Omega, V_{GE} = 15V,$ Parasitic ductance = $75nH, T_C = 25^\circ C$		1.24		mJ
Turn-off switching energy	E_{off}			2.19		
Total switching energy	E_{tot}			3.43		
Total Gate Charge	Q_g	$V_{CE} = 600V, I_C = 30A,$	-	95		nC
Gate to Emitter Charge	Q_{ge}	$V_{GE} = 15V$	-	31		

Gate to Collector Charge	Qgc	-	34.7		
Gate resistance	Rg	F=1MHz, Open collector	2.5		Ω
Short Current	Isc	$V_{GE}=15V, V_{ce}=600V$ tsc<10us	154		A

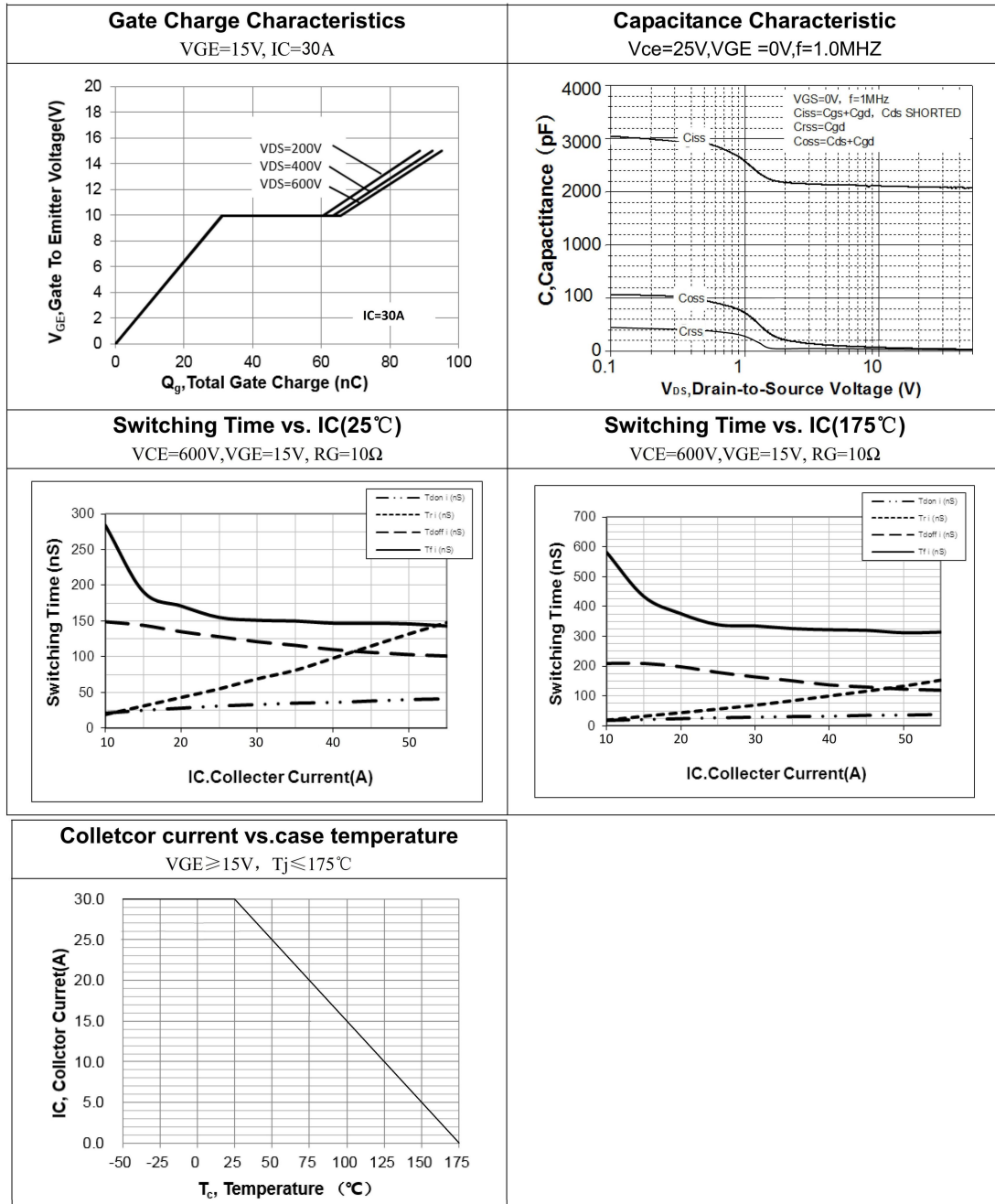
Notes:

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

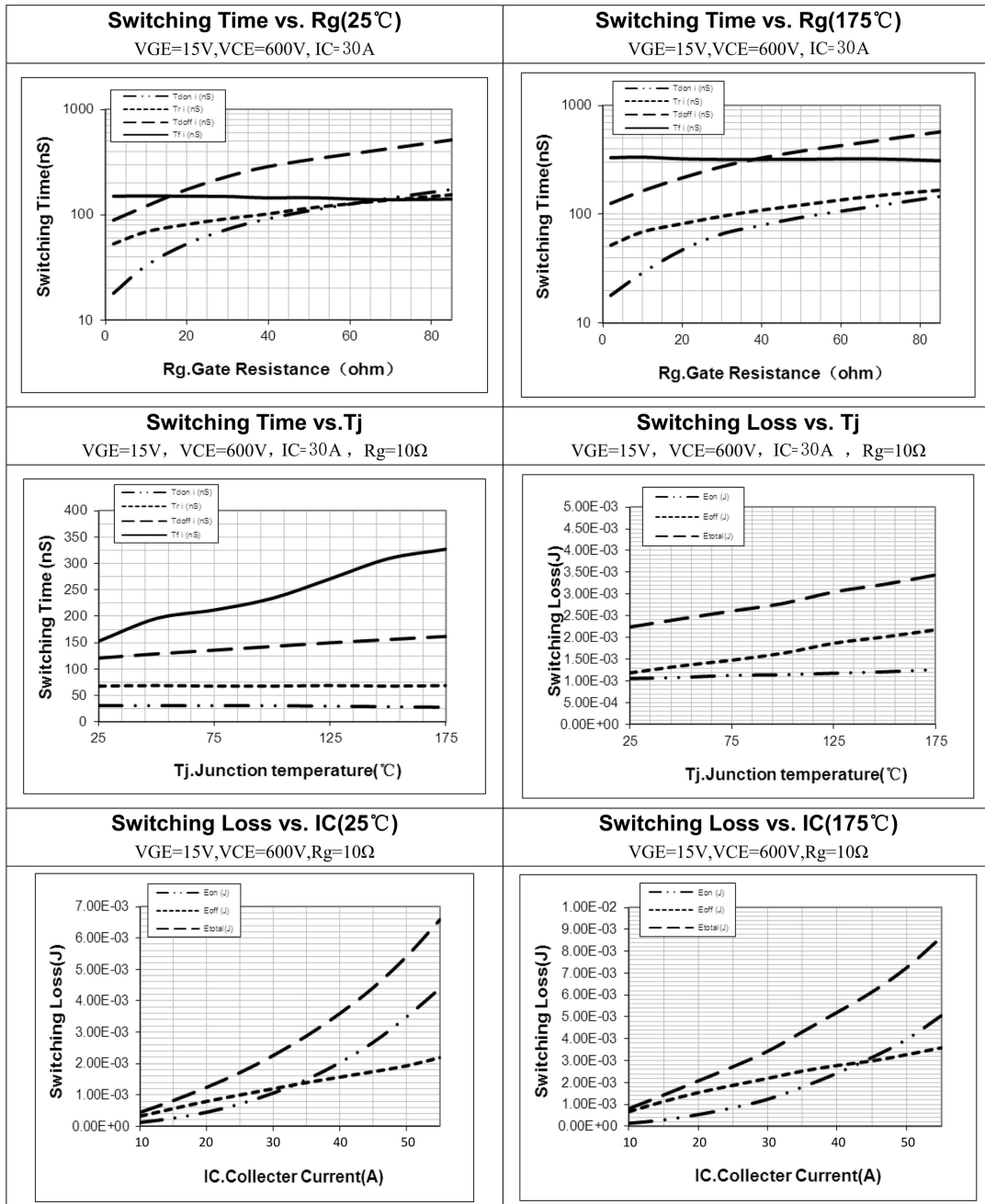
Typical Performance Characteristics



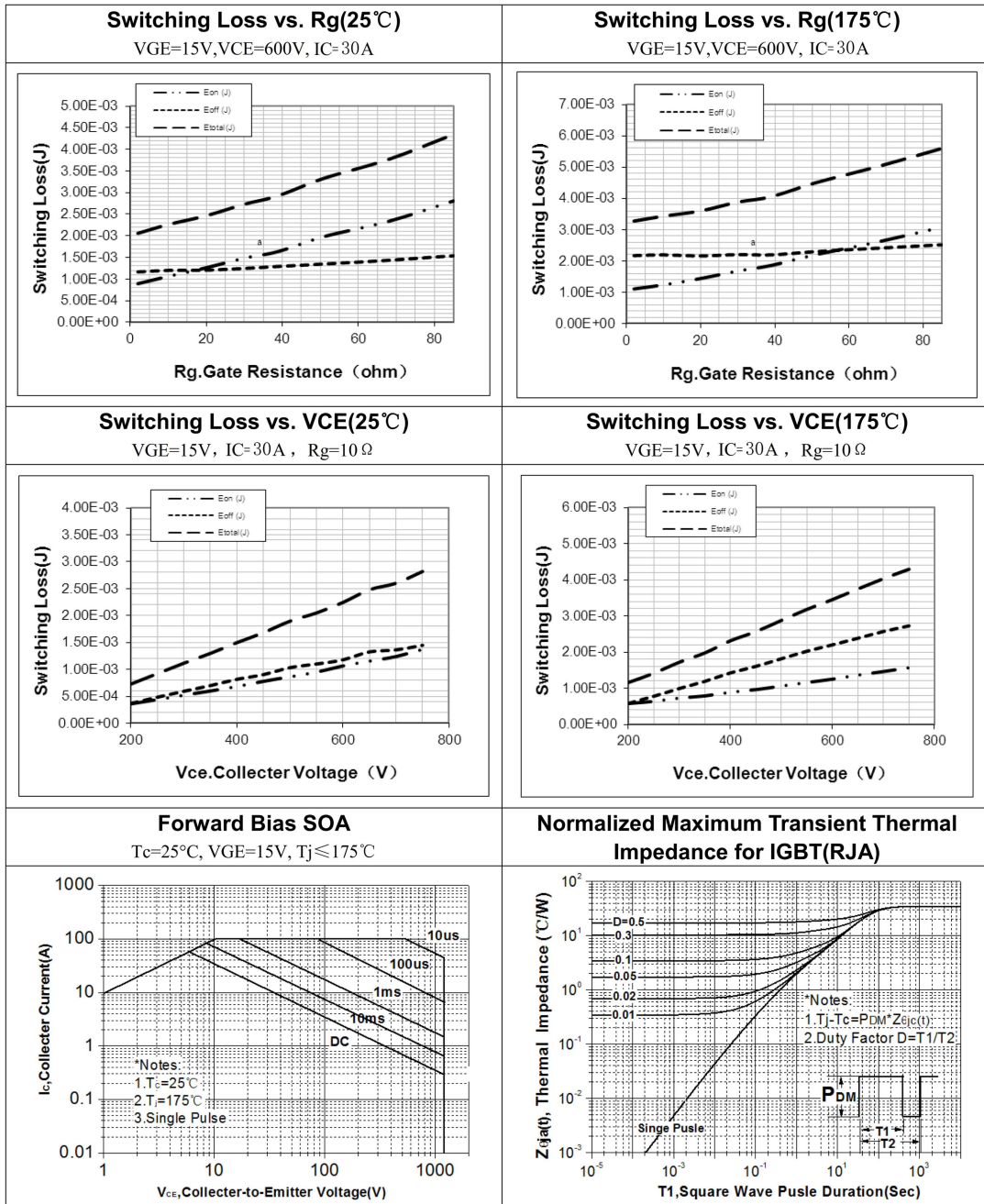
Typical Performance Characteristics



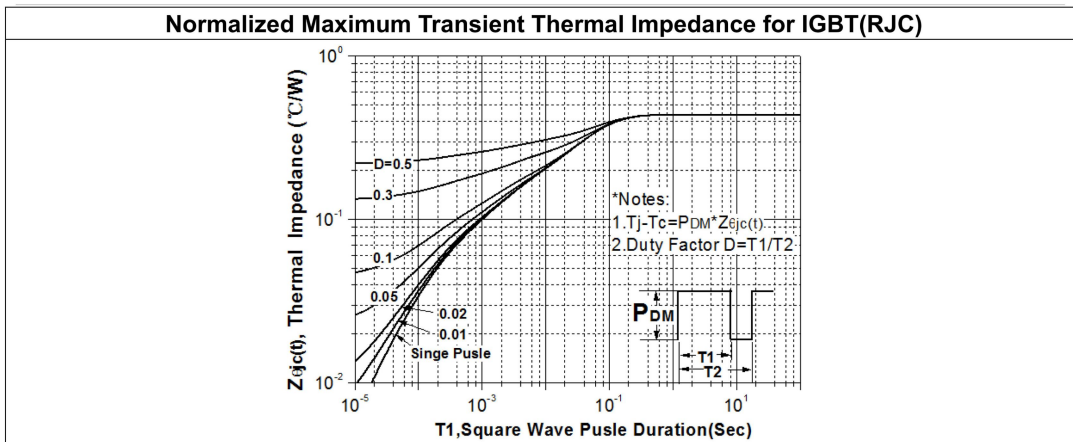
Typical Performance Characteristics



Typical Performance Characteristics



Typical Performance Characteristics



Package outline dimension

