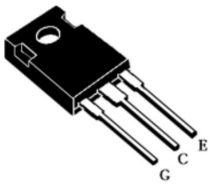
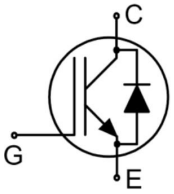
Features

- Low gate charge
- FS Technology
- Short circuit withstand time 10 uS
- Saturation voltage:VCE(sat),typ=1.8V
  @IC=15A and TC=25℃



Applications

- General purpose inverter
- Induction heating(IH)
- UPS



Order Message

Order codes	Marking	Package
MSG15T120FQC	MSG15T120FQC	TO-247

Absolute Ratings(Tc=25℃)

Parameter	Symbol	Value	Unit
		MSG15T120FQC	
Collector-Emmiter Voltage	V_{ce}	1200	V
Collector Current-continuous	Tc=25℃	30	A
	Tc=100℃	15	
Diode forward current	Tc=100℃	15	
Collector Current-pulse (note 1)	I_{CM}	45	
Gate-Emiter Voltage	V_{GES}	±30	V
Turn-off safe area	-	45	A
Power Dissipation	PD Tc=25℃	200	W
Operating and Storage Temperature Range	T_J,T_{STG}	-55~+150	℃
Maximum Lead Temperature for Soldering Purposes	T_L	300	℃

*Collector current limited by maximum junction temperature

Electrical Characteristics

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Collector-Emmiter Voltage	BV_{CES}	Ic=500uA,V_{GE}=0V	1200	-	-	V
Breakdown Voltage Temperature Coefficient	$\triangle BV_{CES}/\triangle T_J$	Ic=1mA,referenced to 25℃	-	0.6	-	V/℃
Zero Gate Voltage Collector Current	I_{CES}	V_{CE}=1200V,V_{GE}=0V, Tc=25℃	-	-	0.2	mA
		Tc=100℃			2	mA
		Tc=150℃	-	-	2.5	mA
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},Ic=600uA	4.5	-	6.5	V
Collector-Emmiter saturation Voltage	V_{CESAT}	V_{GE}=15V Ic=15A Tc=25℃ Tc=125℃ Tc=150℃	- - -	1.8 2.0 2.1	2.4 - -	V
Short Collector current(Note 2)	$I_{C(SC)}$	V_{GE}=15V V_{CE}=600V tsc<10usTc=25℃		120		A
Dynamic Characteristics						
Input capacitance	Cies	V_{CE}=25V, V_{GE}=0V, f=1.0MHZ	-	1330	2000	pF
Output capacitance	Coes		-	100	160	pF
Reverse transfer capacitance	Cres		-	70	110	pF

Electrical Characteristics

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Switching Characteristics						
Turn-on delay time	td(on)	V_{CE}=600V,Ic=15A,R_G=10Ω Tc=25℃ Inductive Loda	-	80		ns
Turn-On rise time	tr		-	65		ns
Turn-Off delay time	td(off)		-	180		ns
Turn-Off Fall time	t_f		-	80		ns
Turn-on energy	E_{on}			2		mJ
Turn-off energy	E_{off}			0.9		mJ
Total switching energy	E_{total}			2.9		mJ
Total Gate Charge	Qg	V_{CE}=600V, Ic=15A V_{GE}=15V(note 3,4)	-	100		nC
Anti-Parallel Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_F	V_{GE}=0V,I_F=15A	-	1.6	2.9	V
Diode Reverse recovery time	t_{rr}	VGE=0V,VR=800V IF=15A dl=/dt=750A/us (note 4)	-	200	-	ns
Reverse recovery charge	Q_{rr}		-	1.1	-	uC

Thermal Characteristic

Paramer	Symbol	Max	Unit
Thermal Resistance,Junction to Case	Rth(j-c)	0.6	℃/W
Thermal Resistance,Junction to Ambient	Rth(j-A)	40	℃/W

Notes:

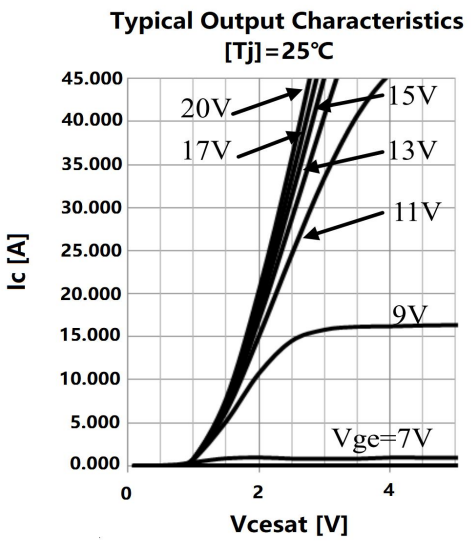
1: Pulse width limited by maximum junction temperature

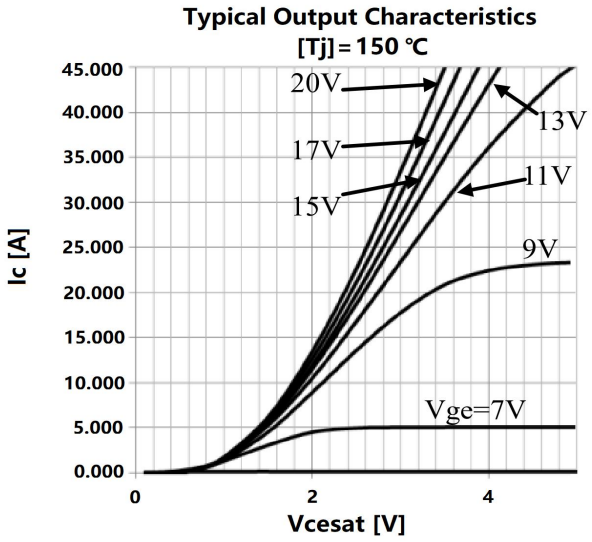
2: Allowed number of short circuits:<1000; time between short circuits:>1s.

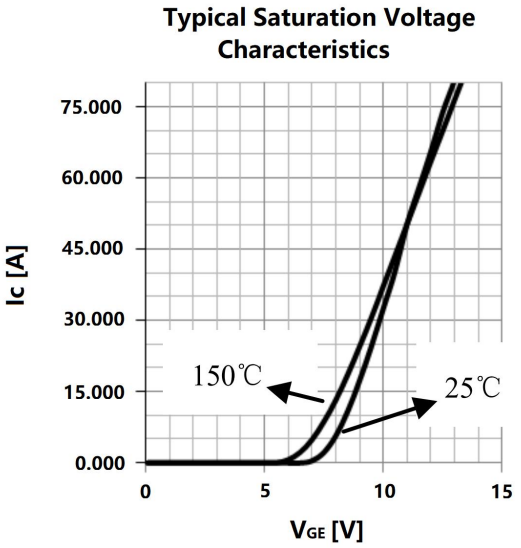
3: Pulse Test: Pulse Width s300us, Duty Cycles2%

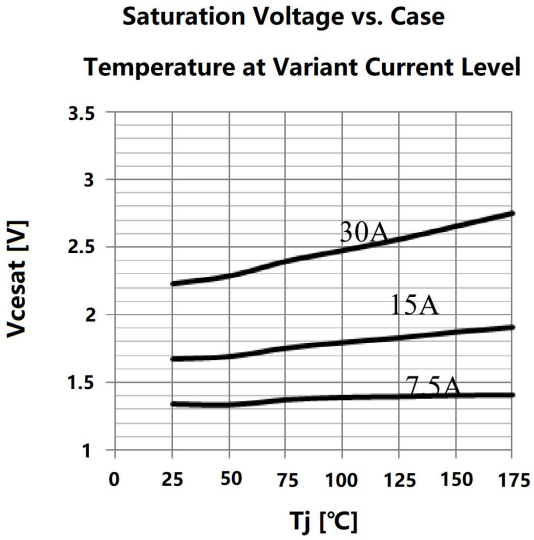
4: Essentially independent of operating temperature

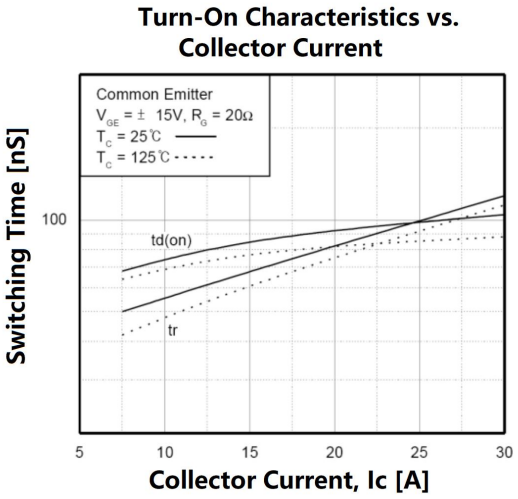
Electrical Characteristics(curves)

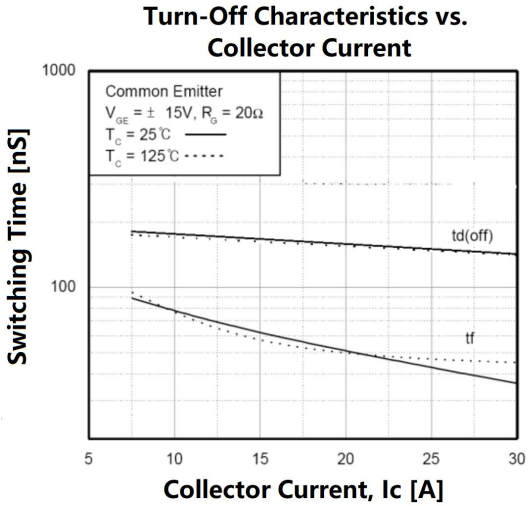




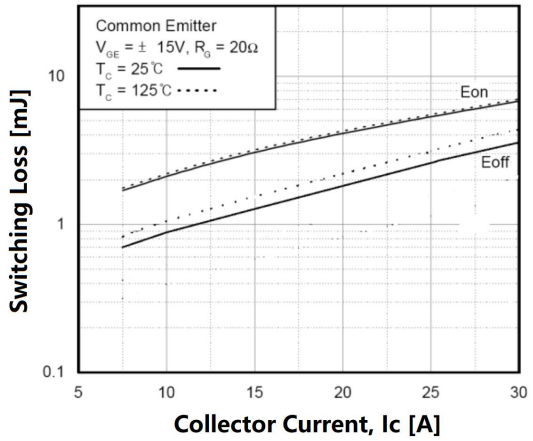




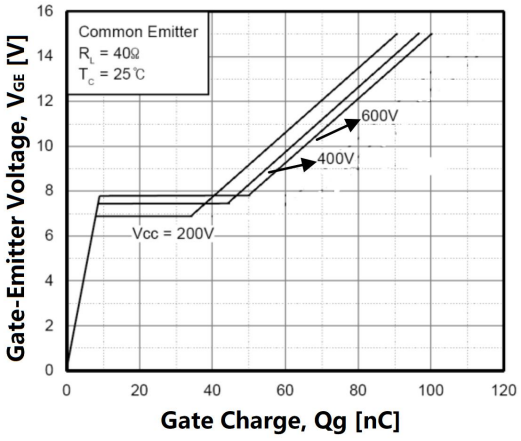




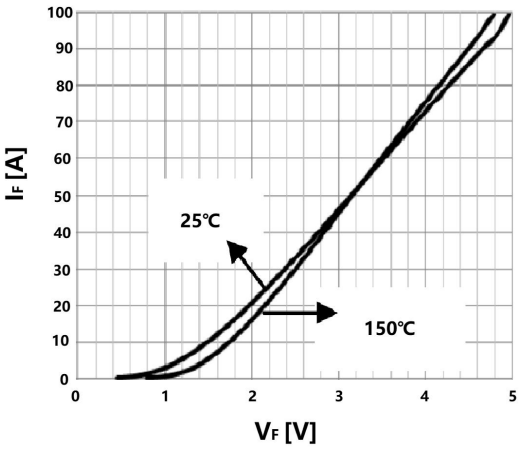
Switching Loss vs. Collector Current



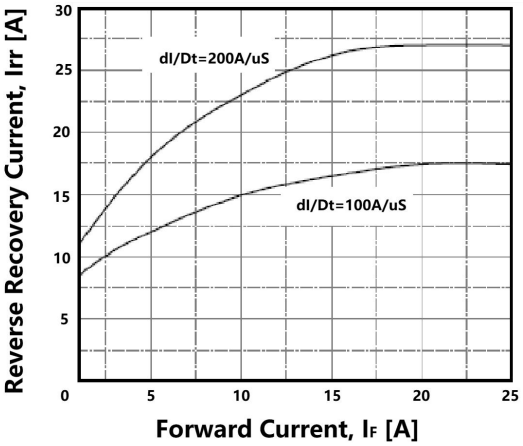
Gate Charge Characteristics



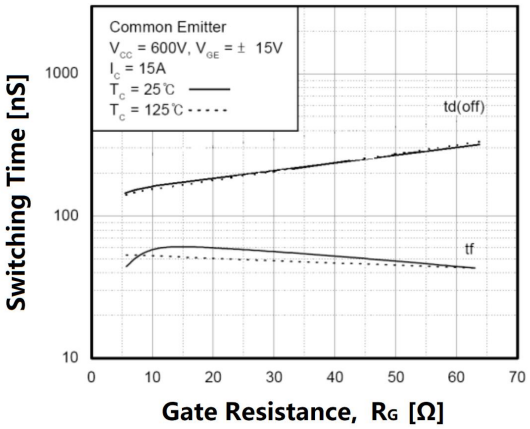
Forward Characteristics



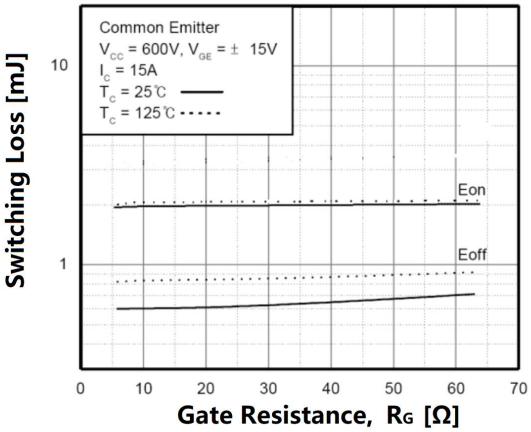
Reverse Recovery Current



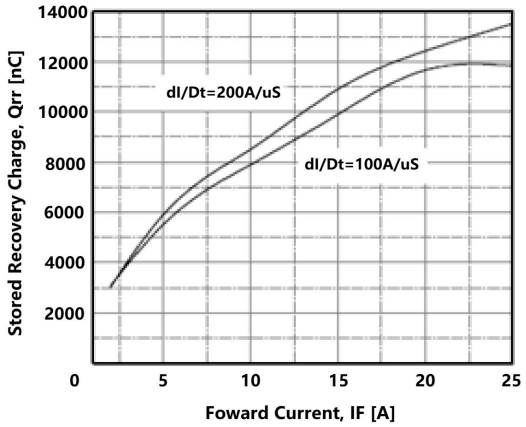
Turn-Off Characteristics vs. Gate Resistance



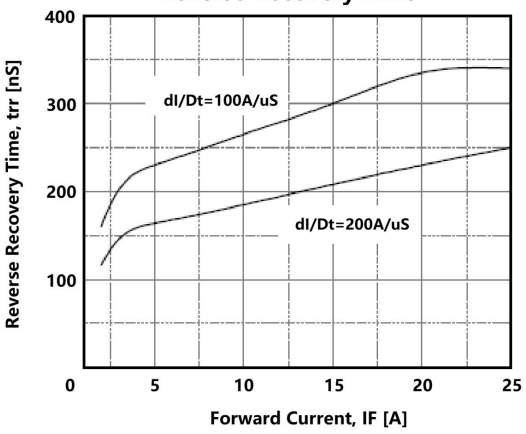
Switching Loss vs. Gate Resistance



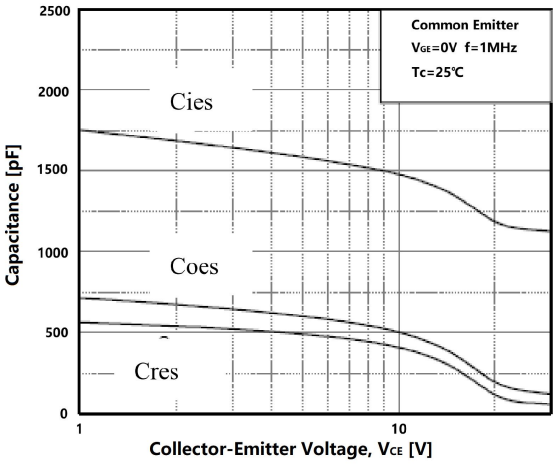
Stored Charge



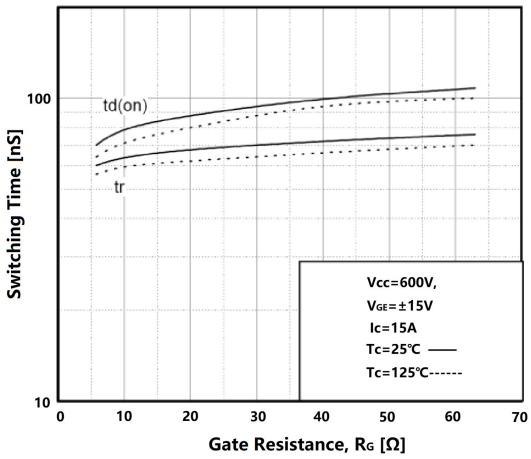
Reverse Recovery Time



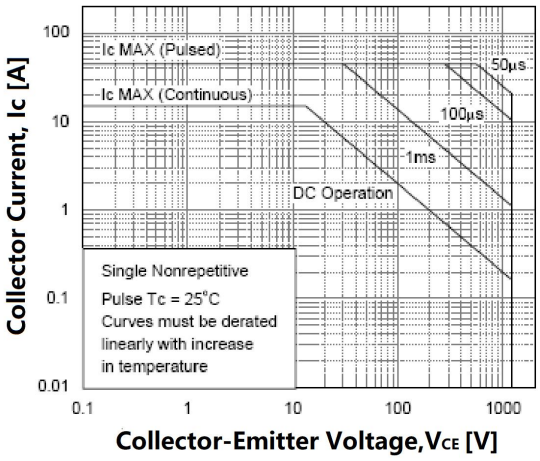
Capacitance Characteristics



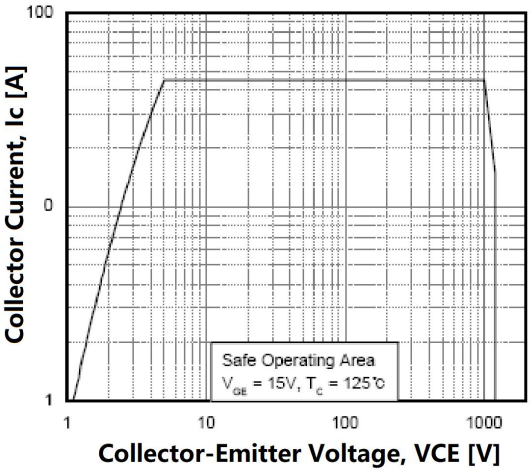
Turn-Off Characteristics vs. Gate Resistance

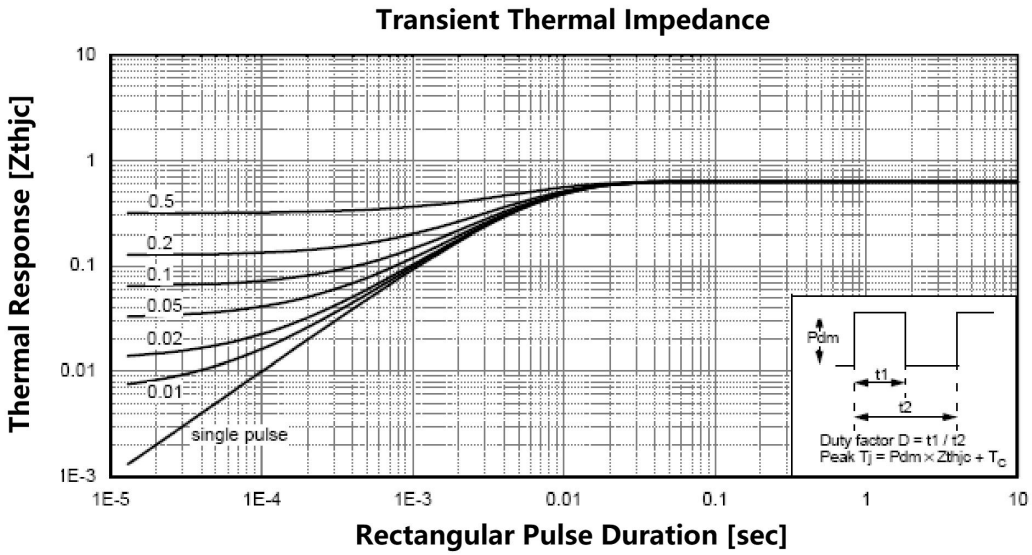


SOA Characteristics



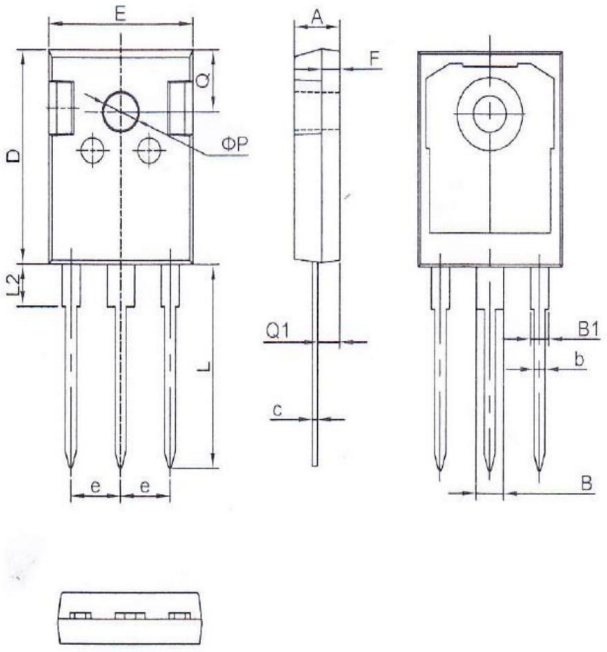
Turn-Off SOA





Package Mechanical DATA

TO-247



Symbol	Min	Max
A	4.9	5.1
B	2.95	3.35
B1	1.95	2.35
b	1.15	1.35
c	0.5	0.7
D	20.9	21.1
E	15.7	15.9
e	5.34	5.54
F	1.9	2.1
L	19.4	20.4
L2	4.03	4.23
Q	6	6.4
Q1	2.3	2.5
P	3.5	3.7