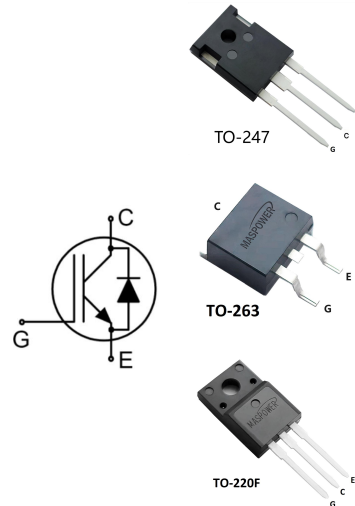


Features

- Low gate charge
- Trench FS Technology,
- saturation voltage: $V_{CE(sat)}$,
Typ = 1.6V, $I_C=20A$ and $T_C=25^\circ C$
- RoHS product

Applications

- General purpose inverters
- UPS



Absolute Ratings ($T_C=25^\circ C$)

Parameter	Symbol	Typ	Unit
Collector-Emitter Voltage	V_{CES}	650	V
Collector Current-continuous	I_C $T=25^\circ C$ $T=100^\circ C$	40	A
		20	A
Collector Current-pulse	I_{CM}	80	A
Diode RMS forward current	I_F $T=25^\circ C$ $T=100^\circ C$	40	A
		20	A
Gate-Emitter Voltage	V_{GES}	± 20	V
Turn-off safe area	-	180	A
Surge non repetitive forward current $t_p=10ms$ sinusoidal	I_{FSM}	80	A
Power Dissipation (TO-247/TO-263)	P_D $T_C=25^\circ C$	162	W
(TO-220F)		46	W
Diode Forward Current	$T_C=100^\circ C$	20	A
Operating and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^\circ C$
Maximum Lead Temperature for Soldering Purposes	T_L	300	$^\circ C$

*Collector current limited by maximum Junction temperature

Thermal Characteristic

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Collector-Emitter Voltage	BV_{CES}	$I_C=500\mu A, V_{GE}=0V$	650	-	-	V

Breakdown Voltage Temperature Coefficient	$\Delta BV_{CES}/\Delta T_J$	$I_C=1mA,reference$ $d\ to\ 25^{\circ}C$	-	0.5	-	$V/^{\circ}C$
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V,V_{GE}=0$ $V,T_C=25^{\circ}C$	-		10	μA
Gate-body leakage current	I_{GESF}	$V_{CE}=0V,V_{GE}=\pm$ $20V$	-	-	200	nA
On-Characteristics						
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE},$ $I_C=250\mu A$	4.5	-	6.5	V
Collector-Emitter saturation Voltage	V_{CESAT}	$V_{GE}=15V,I_C=20A,$ $T_C=25^{\circ}C$	-	1.6	2.0	V
		$T_C=125^{\circ}C$		1.75	2.15	
		$T_C=175^{\circ}C$		1.9	2.3	
Short Collector current	$I_C(sc)$	$V_{GE}=15V$ $V_{CE}=360V\ tsc<$ $10\mu s\ T_C=25^{\circ}C$		116.7		A
Dynamic Characteristics						
Input capacitance	C_{ies}	$V_{CE}=25V,$ $V_{GE}=0V,$ $f=1.0MHZ,$ $T_C=25^{\circ}C$	-	1500	-	pF
Output capacitance	C_{oes}		-	128	-	pF
Reverse transfer capacitance	C_{res}		-	28.7	-	pF
Switching Characteristics						
Turn-On delay time	$t_d(on)$	$V_{CE}=400V,I_C=20A$ $,R_G=10\Omega,V_{GE}=15$ V $T_C=25^{\circ}C$ Inductive Load	-	16	-	ns
Turn-On rise time	t_r		-	56	-	ns
Turn-off delay time	$t_d(off)$		-	52	-	ns
Turn-off Fall time	t_f		-	82	-	ns
Turn-on energy	E_{on}		-	0.79	-	mJ
Turn-off energy	E_{off}		-	0.3	-	mJ
Total switching Energy	E_{total}		-	1.09	-	mJ
Total Gate Charge	Q_g	$V_{CE}=400V,I_C=20$ $AR_G=10\Omega,V_{GE}=1$ $5V$	-	43.9	-	nC
Anti-Paraller Diode Characteristics and Maximum Ratings						
Diode Forward Voltage	V_F	$V_{GE}=0V,I_F=20A.$ $T_C=25^{\circ}C$	-	1.4	-	V
		$V_{GE}=0V,I_F=20A.$ $T_C=175^{\circ}C$	-	1.0	-	V
Diode Reverse recovery time	t_{rr}	$V_{GE}=0V,\ IF=20A$ $dl=/dt=100A/us$	-	254	-	ns
Reverse recovery	Q_{rr}		-	347	-	μC

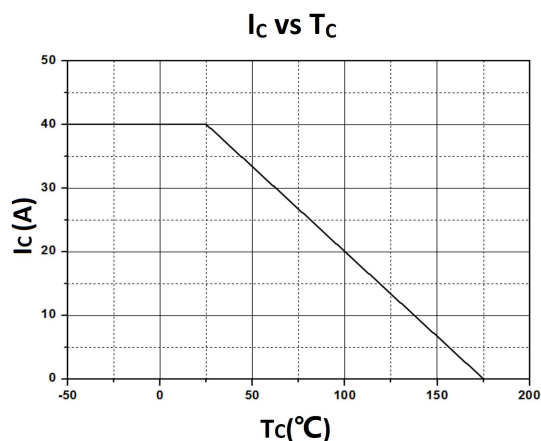
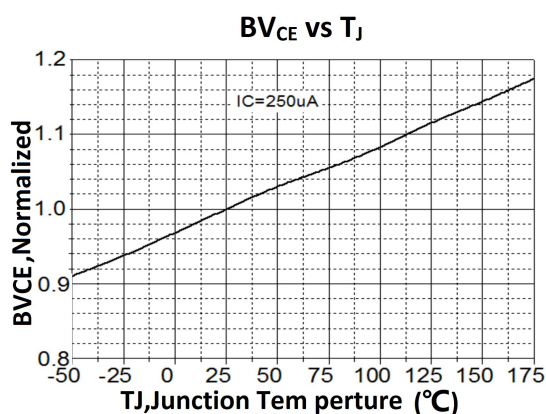
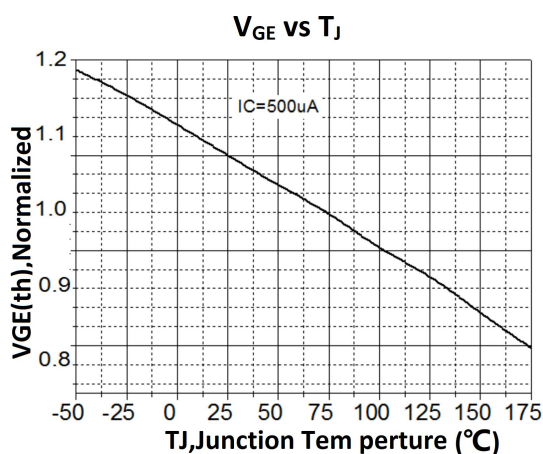
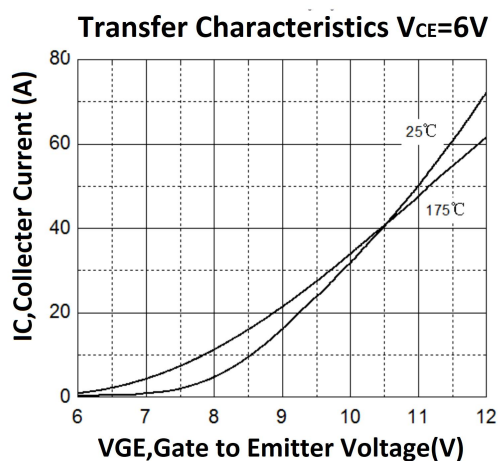
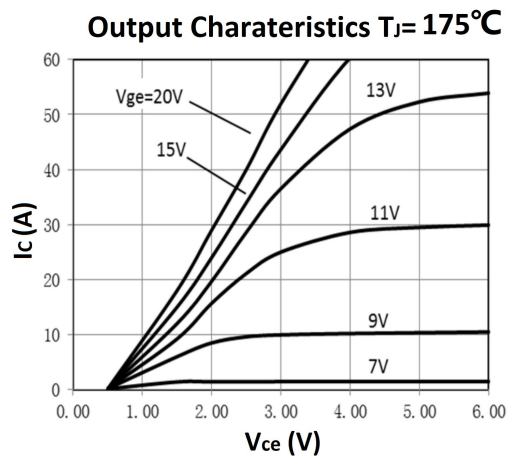
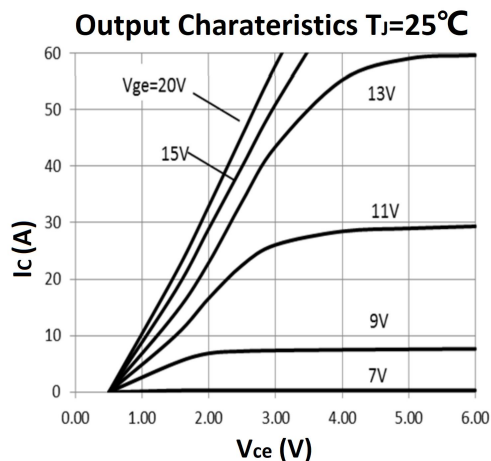
charge						
Diode Reverse recovery Current	I _{rrm}		-	2.7	-	A

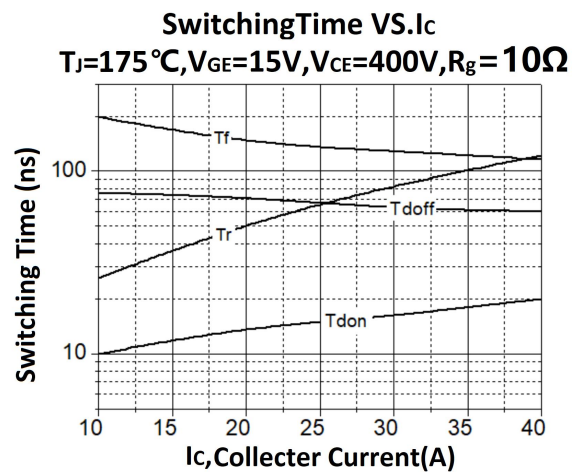
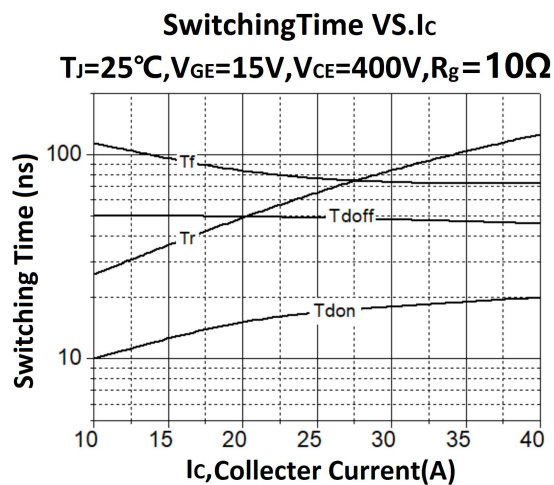
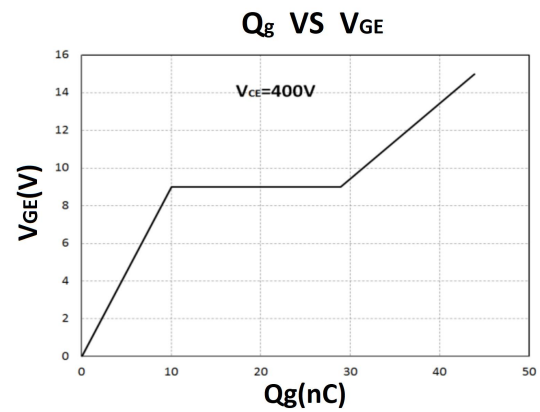
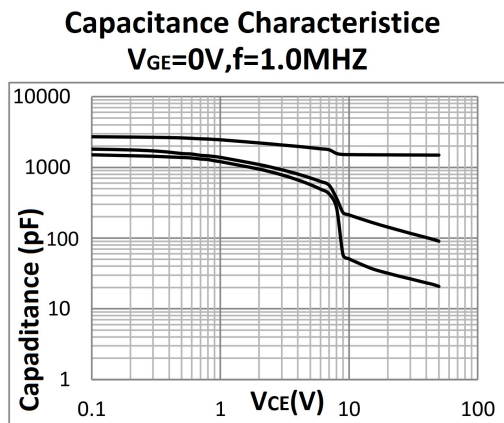
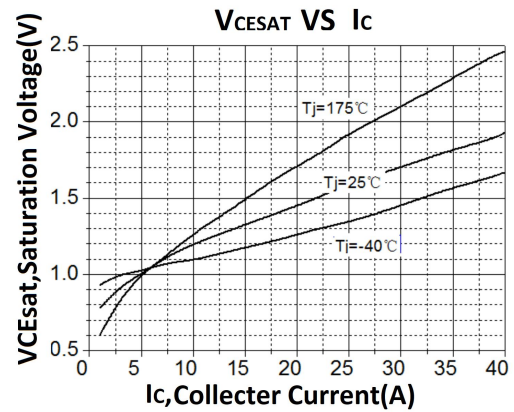
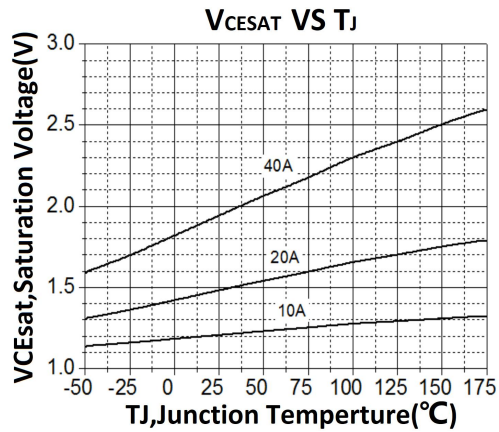
Parameter	Symbol	Type		Unit
		TO-263/TO-247	TO-220F	
IGBT Thermal Resistance, Junction to Case	R _{th(j-c)}	0.77	2.71	°C/W
FRD Thermal Resistance, Junction to Case	R _{th(j-c)}	2.05	7.7	°C/W
Thermal Resistance, Junction to Ambient	R _{th(j-A)}	33.8	62.5	°C/W

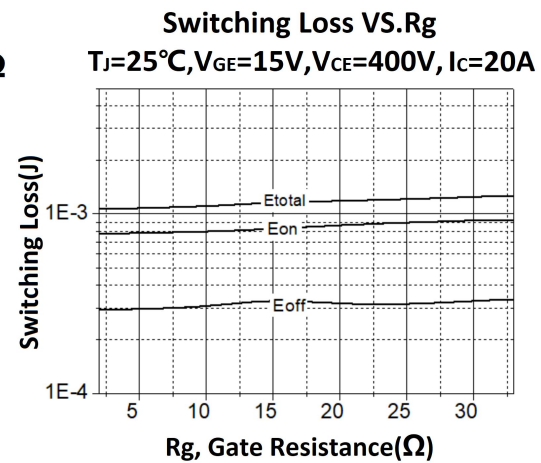
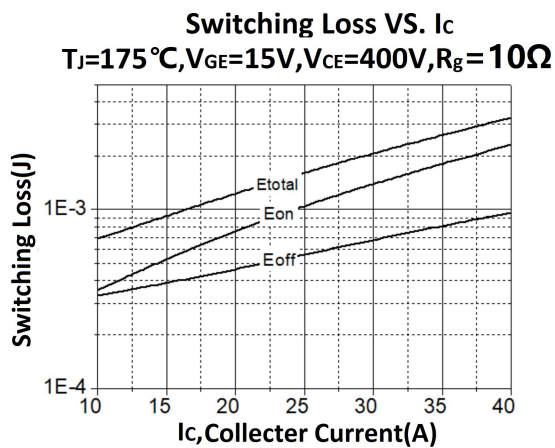
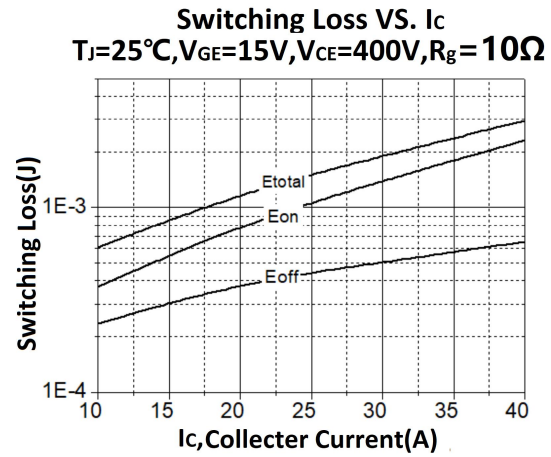
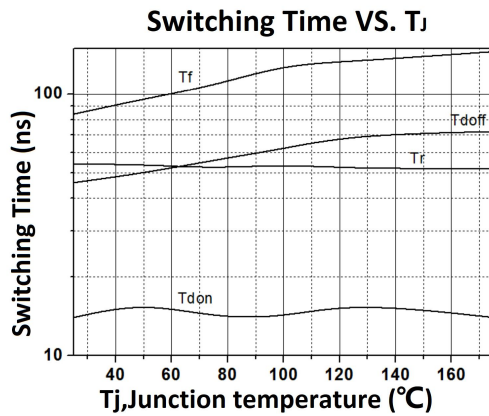
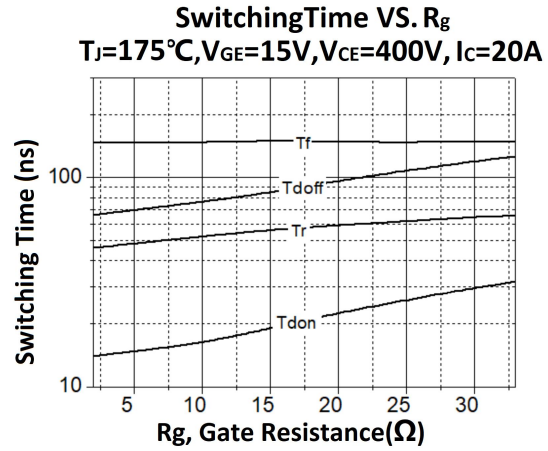
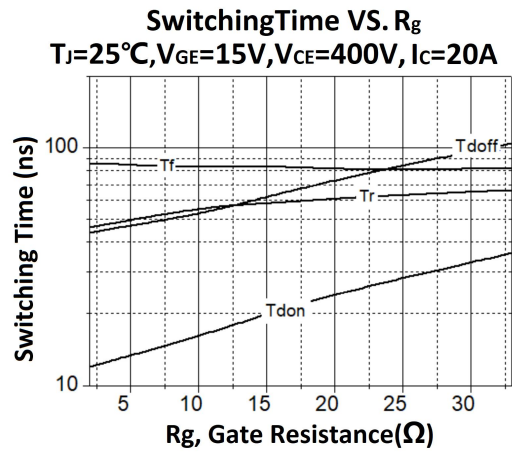
Order information

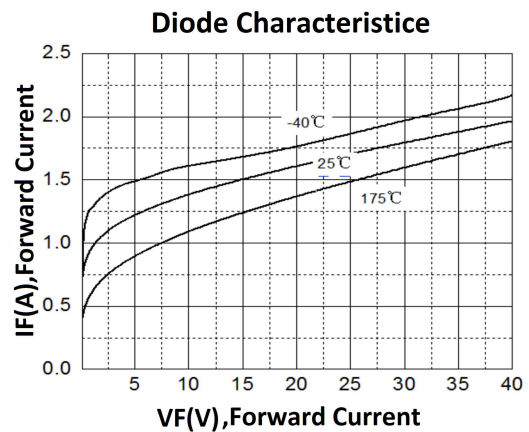
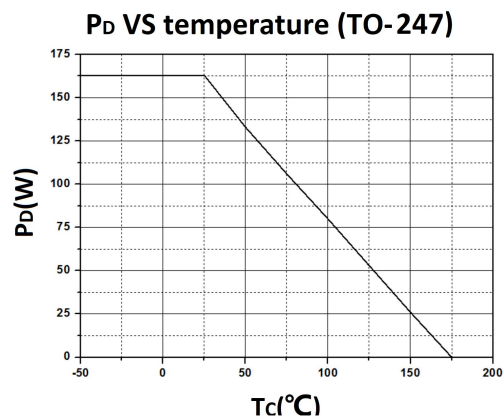
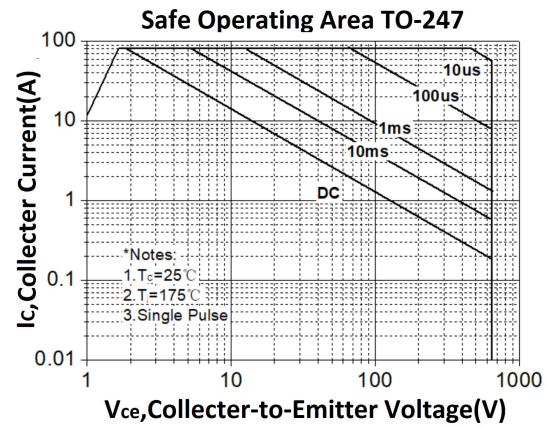
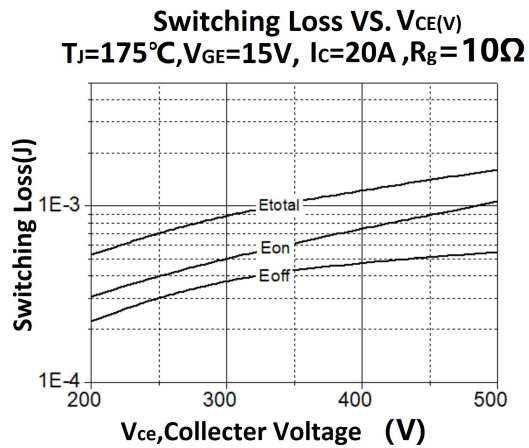
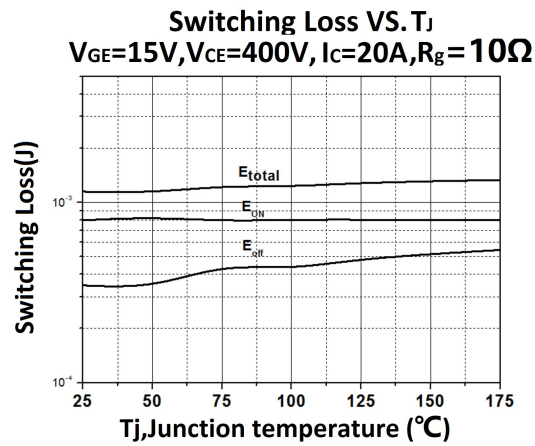
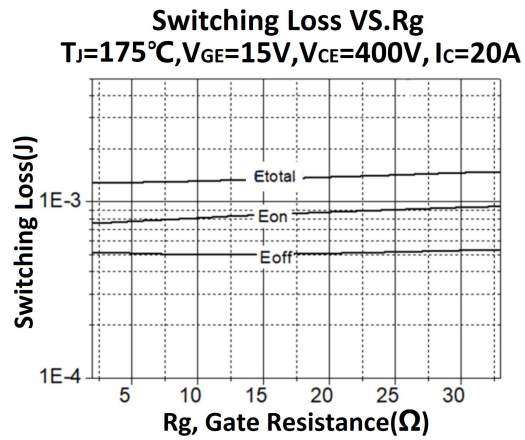
type	Package
MSG20T65HPC0	TO-247
MSG20T65HPE0	TO-263
MSG20T65HPT1	TO-220F

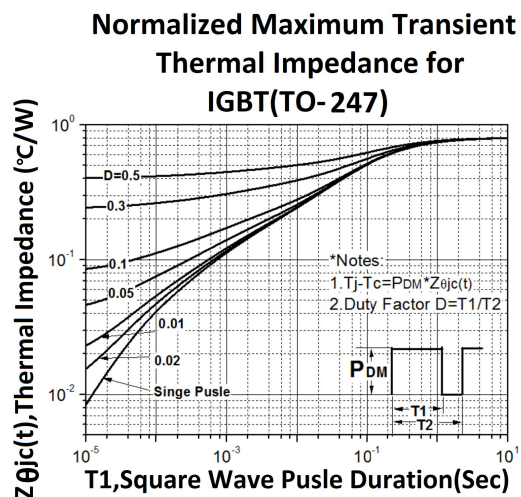
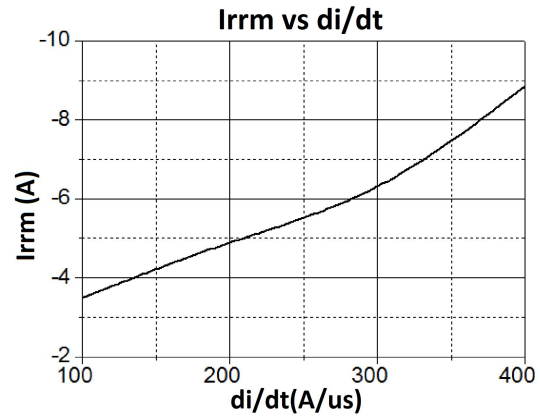
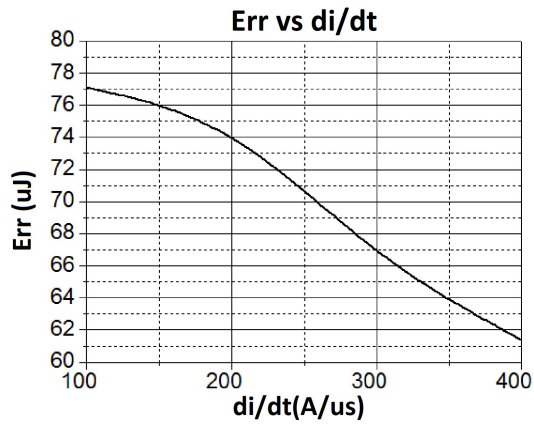
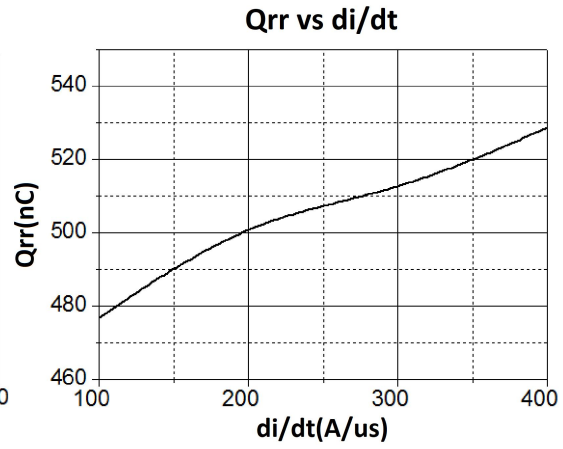
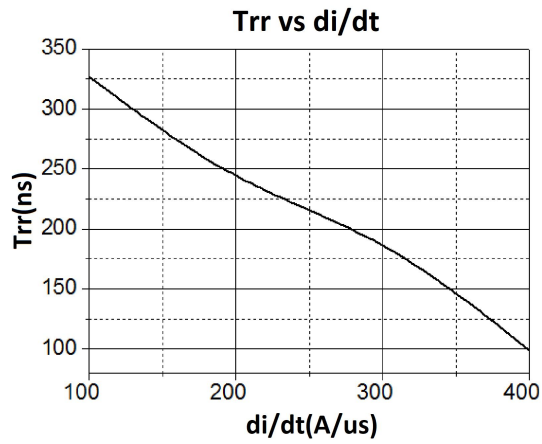
Electrical Characteristics(curves)











Package Mechanical DATA

