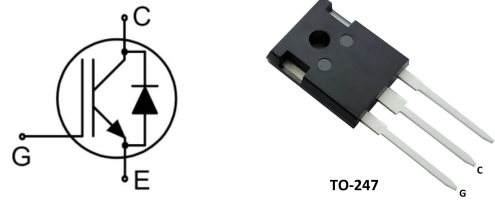


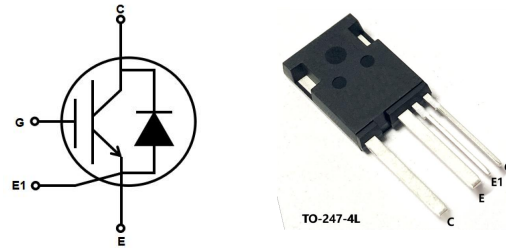
MSG75T65HFC0/MSG75T65HFC6

Features

- Low gate charge
- Trench FS Technology
- Fast switching speed
- Low switching losses
- Low $V_{CE(sat)}$
- Lower EMC interference
- RoHS product



MSG75T65HFC0



MSG75T65HFC6

Applications

- Charging pile
- UPS
- Solar converters

Absolute Ratings($T_c=25^{\circ}\text{C}$)

Parameter	Symbol	conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}		650	V
Collector Current-continuous*	I_C	$T=25^{\circ}\text{C}$	150	A
		$T=100^{\circ}\text{C}$	75	A
Collector Current-pulse (note 1)	I_{CM}		300	A
Diode RMS forward current	I_F	$T=25^{\circ}\text{C}$	150	A
		$T=100^{\circ}\text{C}$	75	A
Surge non repetitive forward current	I_{FSM}	$t_p=10\text{ ms, sine}$	300	A
Gate-Emitter Voltage	V_{GES}		± 20	V
Power Dissipation	P_D	$T_c=25^{\circ}\text{C}$	625	W
Operating Temperature Range	T_J		$-55\sim+175$	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}		$-55\sim+175$	$^{\circ}\text{C}$
Maximum Lead Temperature for Soldering Purposes	T_L		300	$^{\circ}\text{C}$

*Collector current limited by maximum junction temperature

Electrical Characteristics

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Collector-Emitter Voltage	BV_{CES}	$I_C=250\mu A, V_{GE}=0V$	650	-	-	V
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V$	-	-	80	μA
Gate-body leakage current, forward	I_{GESF}	$V_{CE}=0V, V_{GE}=20V$	-	-	200	nA
Gate-body leakage current, reverse	I_{GESR}	$V_{CE}=0V, V_{GE}=-20V$	-	-	-200	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_C=600\mu A$	3.5	-	6.5	V
Collector-Emitter saturation Voltage	V_{CESAT} TO-247	$V_{GE}=15V$ $I_C=50A$ $T_C=25^{\circ}C$	1.25	-	1.65	V
Collector-Emitter saturation Voltage	V_{CESAT} TO-247-4L		1.15	-	1.55	V
Dynamic Characteristics						
Input capacitance	C_{ies}	$V_{CE}=25V,$ $V_{GE}=0V,$ $f=1.0MHz$	-	2650	-	pF
Output capacitance	C_{oes}		-	320	-	pF
Reverse transfer capacitance	C_{res}		-	63	-	pF

Electrical Characteristics

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{CE}=400V, I_C=75A,$ $R_G=5\Omega$ $T_C=25^\circ C$	-	26	-	ns
Turn-On rise time	t_r		-	90	-	ns
Turn-Off delay time	$t_{d(off)}$		-	95	-	ns
Turn-Off Fall time	t_f		-	80	-	ns
Turn-on energy	E_{on}		-	2.8	-	mJ
Turn-off energy	E_{off}		-	1.5	-	mJ
Total switching energy	E_{total}		-	4.4	-	mJ
Turn-on delay time	$t_{d(on)}$	$V_{CE}=400V, I_C=75A,$ $R_G=5\Omega$ $T_C=175^\circ C$	-	24	-	ns
Turn-On rise time	t_r		-	97	-	ns
Turn-Off delay time	$t_{d(off)}$		-	116	-	ns

Turn-Off Fall time	t _f		-	132	-	ns
Turn-on energy	E _{on}		-	3.0	-	mJ
Turn-off energy	E _{off}		-	2.5	-	mJ
Total switching energy	E _{total}		-	5.5	-	mJ
Total Gate Charge	Q _g	V _{CE} =520V, I _c =75A V _{GE} =15V	-	140		nC
Gate to emitter Charge	Q _{ge}		-	28		nC
Gate to collector Charge	Q _{gc}		-	80		nC
Anti-Parallel Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V _F TO-247	V _{GE} =0V,I _F =30A	-	1.2	-	V
Drain-Source Diode Forward Voltage	V _F TO-247-4L		-	1.1	-	V
Diode Reverse recovery time	t _{rr}	V _{GE} =0V,V _R =200V I _F =75A di/dt=200A/us	-	49	-	ns
Reverse recovery charge	Q _{rr}		-	121	-	nC
Reverse recovery current	I _{rr}		-	3.5	-	A

Thermal Characteristic

Parameter	Symbol	Max	Unit
Junction to Ambient	$R_{th(j-A)}$	40	°C/W
Junction to Case IGBT	$R_{th(j-c)}$	0.24	°C/W
Junction to Case Diode	$R_{th(j-c)}$	0.34	°C/W

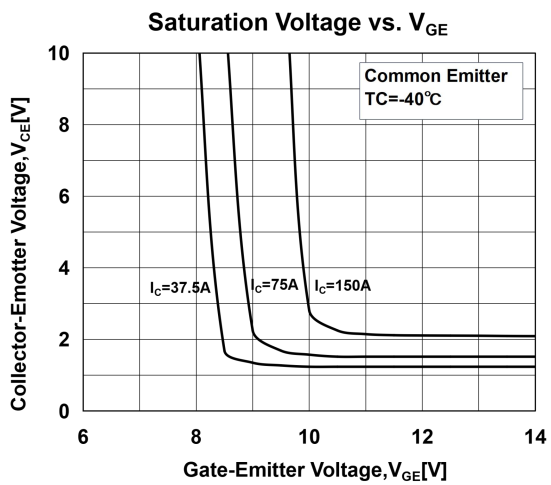
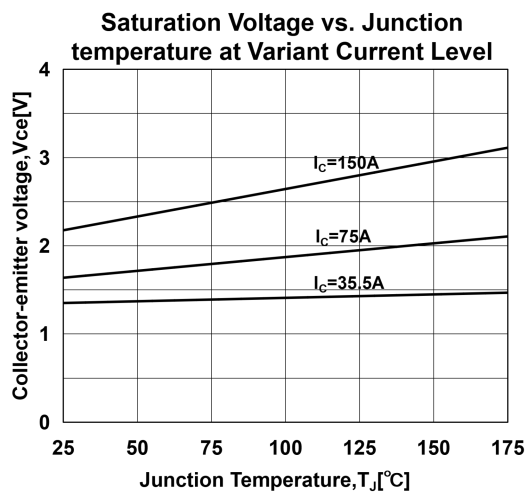
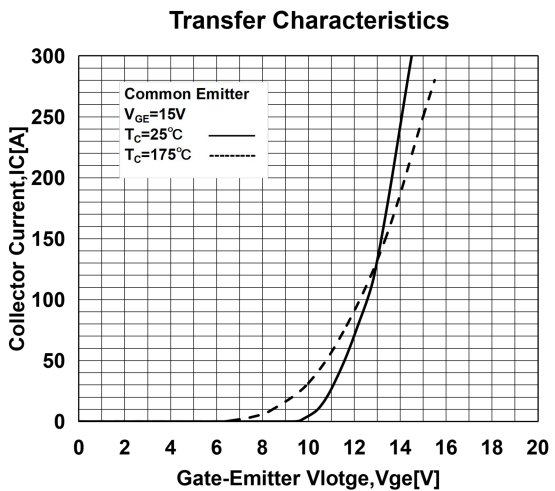
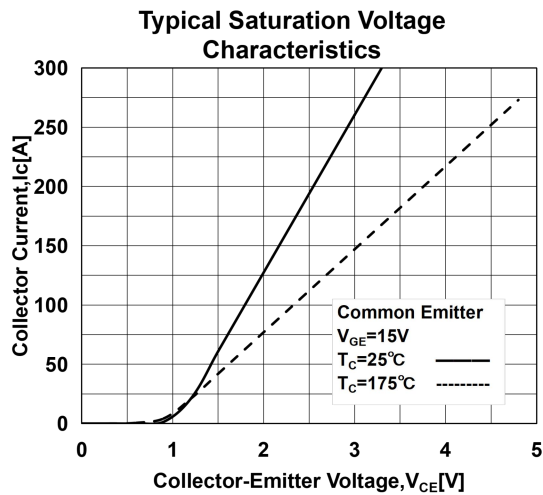
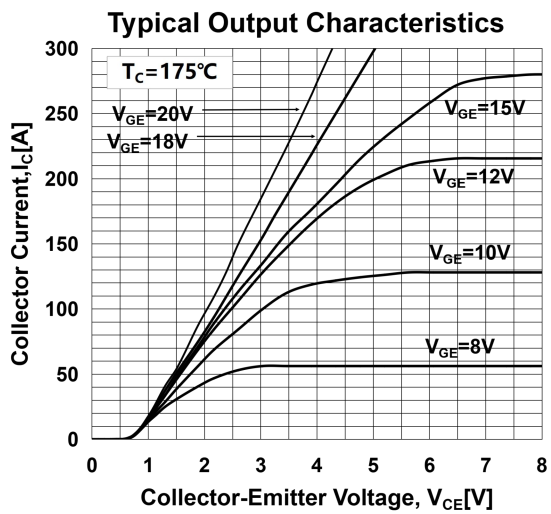
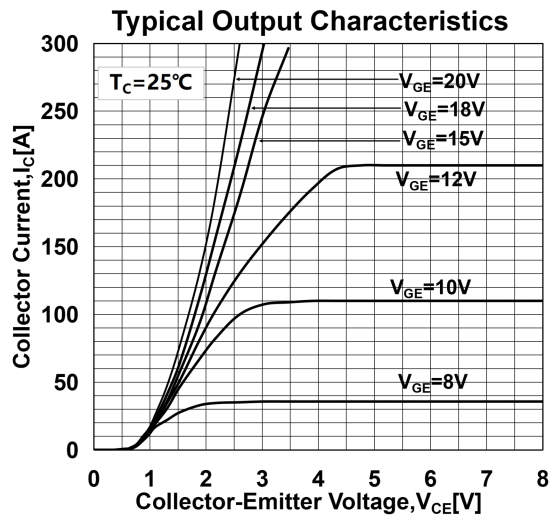
Order Message

Order codes	Marking	Package
MSG75T65HFC0	MSG75T65HFC0	TO-247
MSG75T65HFC6	MSG75T65HFC6	TO-247-4L

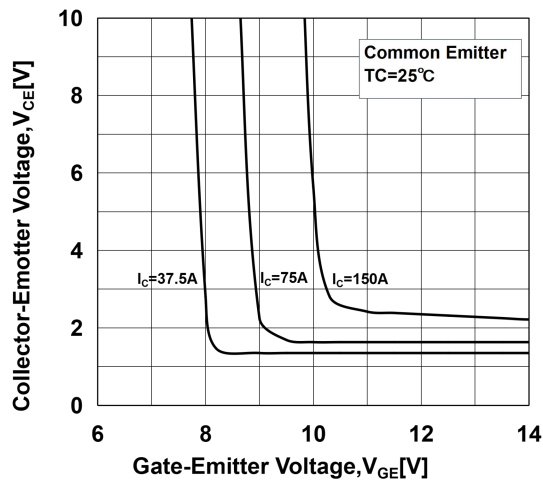
Notes:

1: Pulse width limited by maximum junction temperature

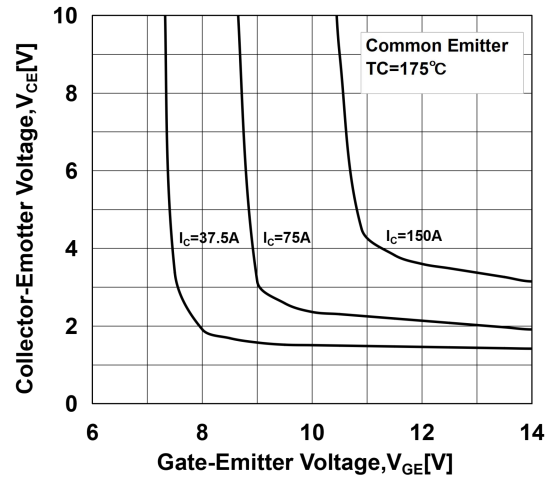
Electrical Characteristics(curves)



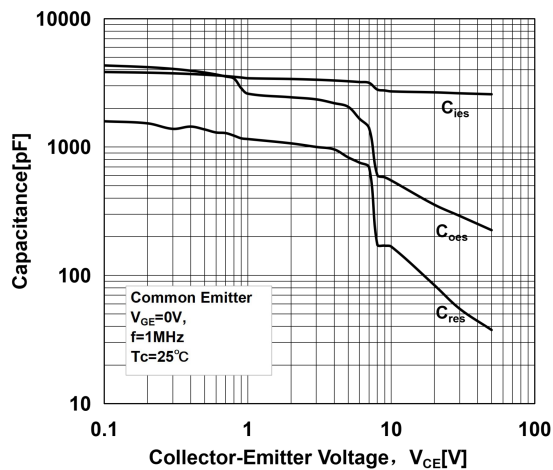
Saturation Voltage vs. V_{GE}



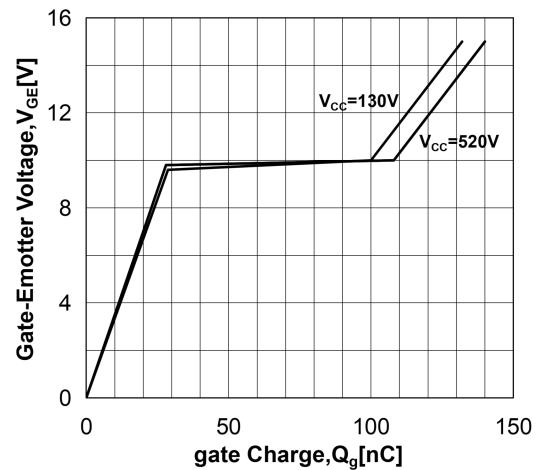
Saturation Voltage vs. V_{GE}



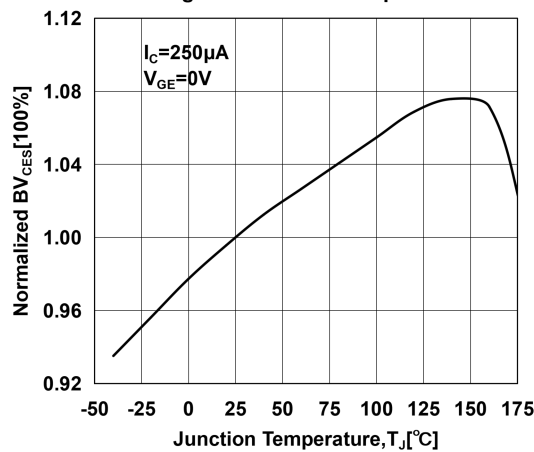
Capacitance Characteristics



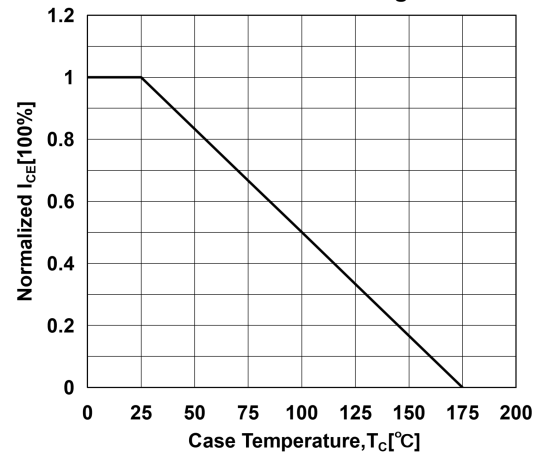
Gate Charge Characteristics

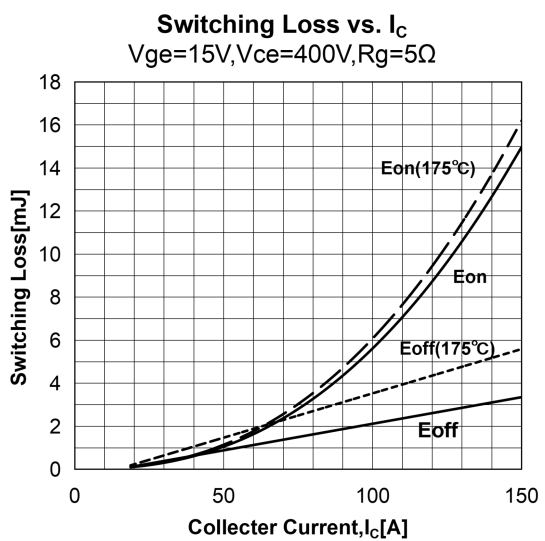
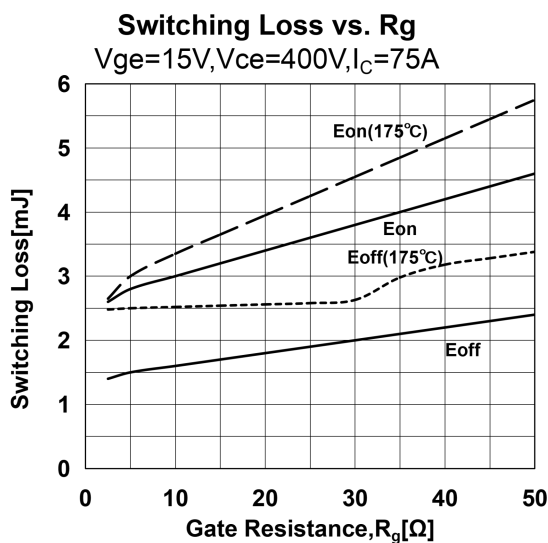
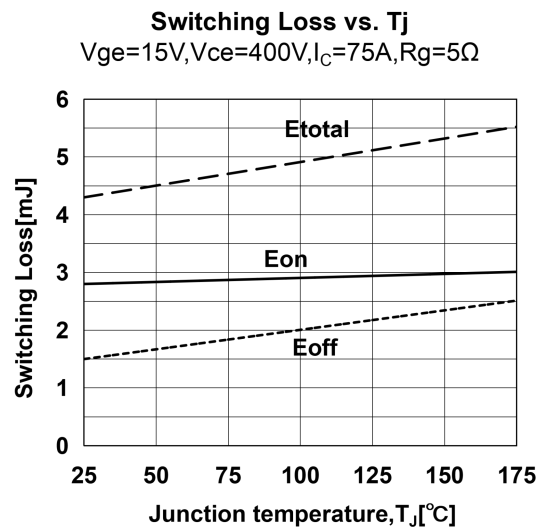
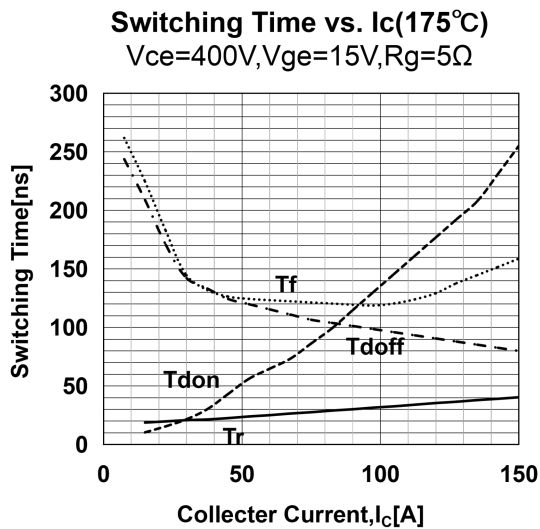
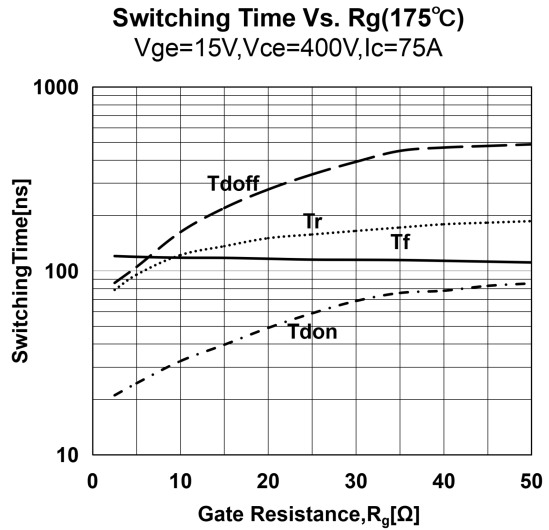
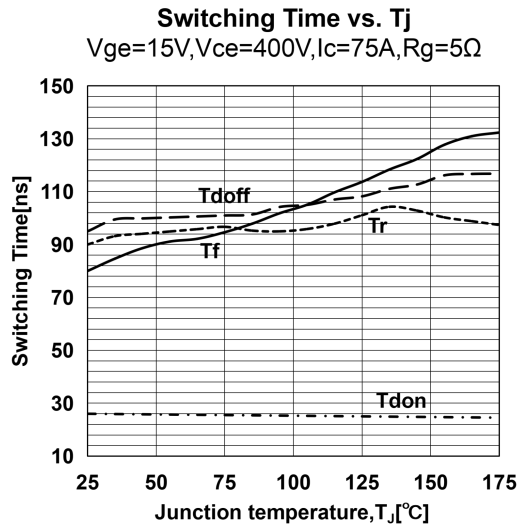


Normalized Collector to Emitter Breakdown Voltage vs. Junction Temperature

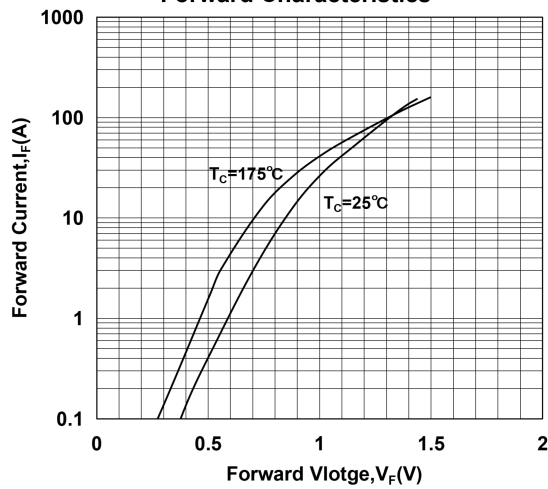


Normalized Collector-Emitter Current Standard Derating Curve

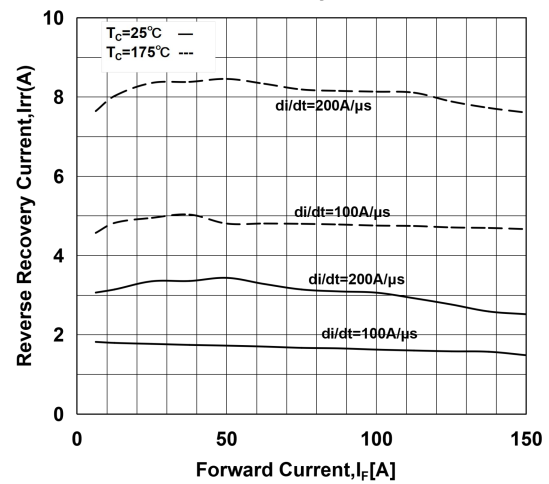




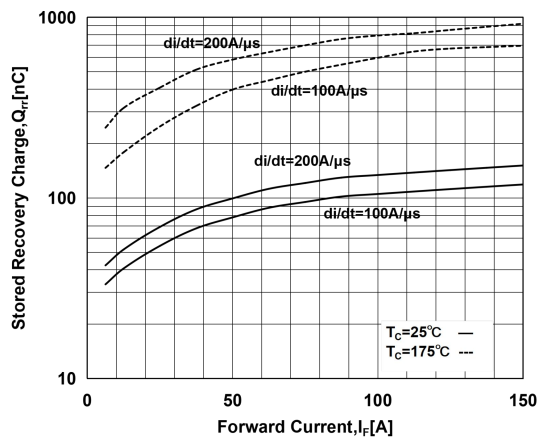
Forward Characteristics



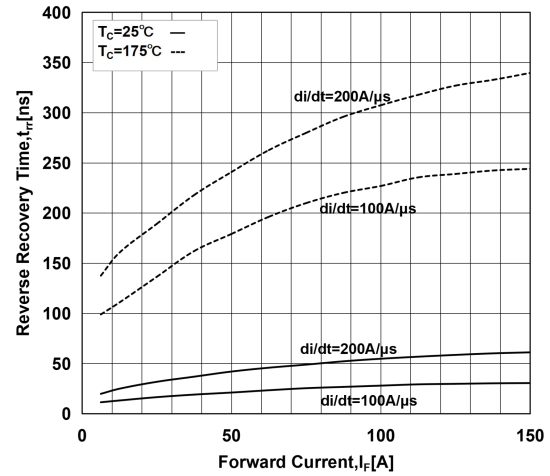
Reverse Recovery Current



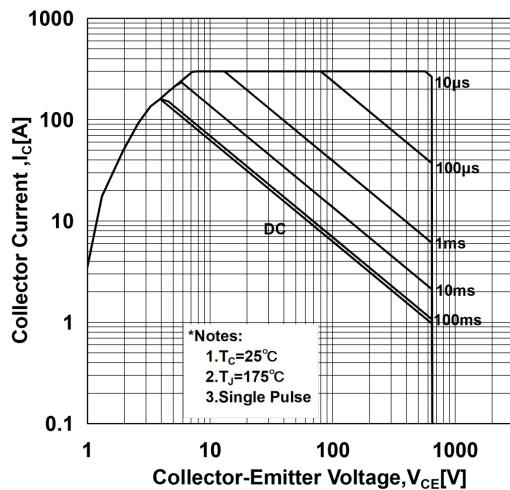
Stored Charge

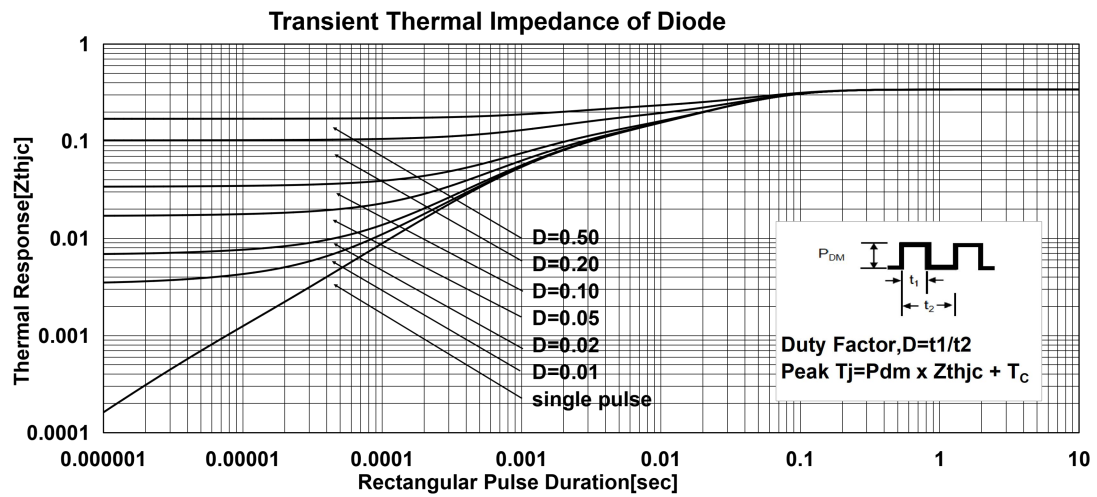
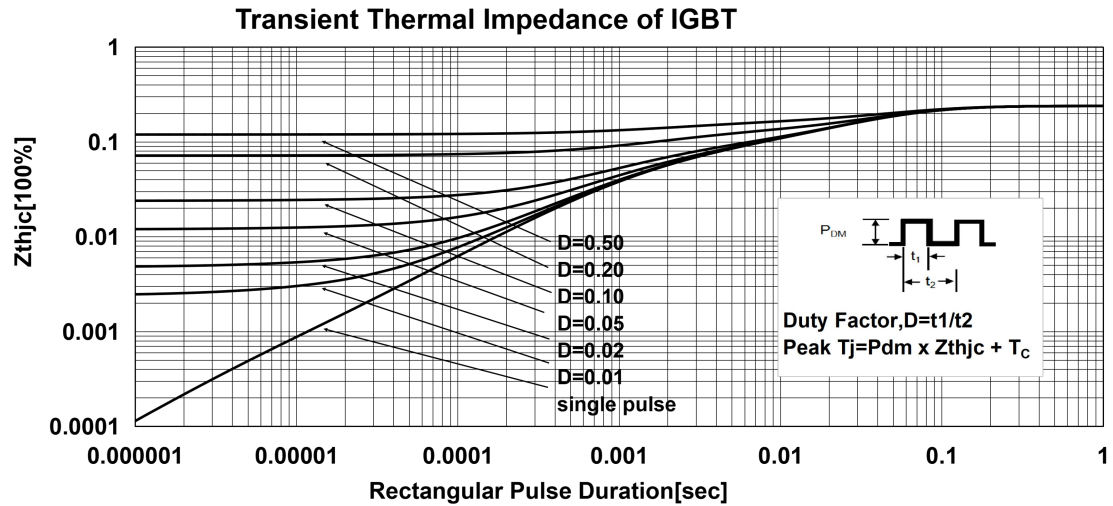


Reverse Recovery Time

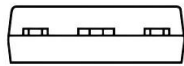
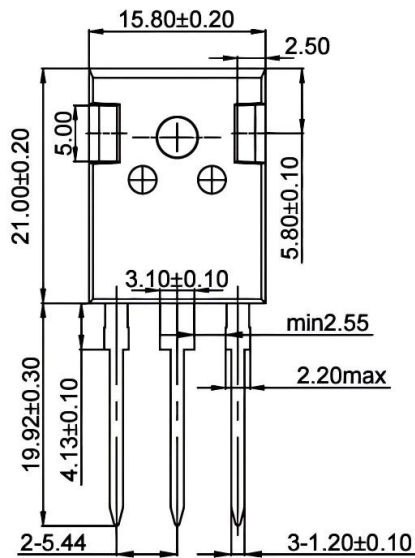


Forward Bias Safe Operating Area



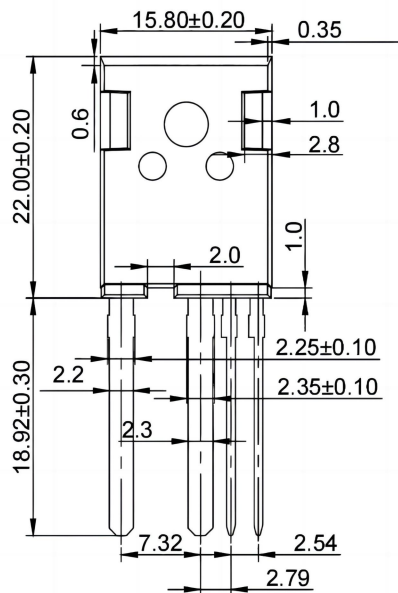


Package Mechanical DATA



NOTES: 1. surface roughness $R_a = 1.14 \pm 0.20 \mu m$
 2. Unmarked tolerance ± 0.15
 3. unit: mm

TO-247



Unit: mm

TO-247-4L

Not:
 1. Unmarked tolerance ± 0.15
 2. pitted surface $R_a 1.6-1.8$