

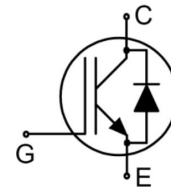
Features

- Very Low Saturation Voltage:
 $V_{CE(sat)(type)} = 1.26\text{ V @ } I_C = 75\text{ A}$
- Maximum Junction Temperature: $T_J = 150^\circ\text{C}$
- Positive Temperature Co-Efficient
- Tight Parameter Distribution
- High Input Impedance



Applications

- Traction Inverter for HEV/EV
- Auxiliary DC/AC Converter
- Motor Drives
- Other Power-Train Applications
Requiring High Power Switch



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

Parameter	Symbol		Value	Unit
Collector-Emitter Voltage	V _{ces}		350	V
Gate-Emitter Voltage	V _{GES}		±30	V
Collector Current-continuous	I _C	T=25℃	240	A
		T=100℃	120	A
Diode forward current	I _F	T=25℃	120	A
		Tc=100℃	60	A
Collector Current-pulse (note 1)	I _{CM}		378	A
Short Circuit Withstand Current (note 1)	I _{SC}		1320	A
Short Circuit Withstand Time (note 2)	t _{sc}		10	us
Power Dissipation	P _D	Tc=25℃	694	W
		Tc=100℃	277	W
Operating and Storage Temperature Range	T _J ,T _{STG}		-55~+150	℃
Maximum Lead Temperature for Soldering Purposes	T _L		300	℃

Electrical Characteristics($T_C=25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Type	Max	Unit
Off-Characteristics						
Collector-Emitter Voltage	BV_{CES}	$I_C=1\text{mA}, V_{GE}=0\text{V}$	350	-	-	V

Zero Gate Voltage Collector Current	I _{CES}	V _{CE} =350V,V _{GE} =0V,	-	-	40	μA
		V _{CE} =350V,V _{GE} =0V, T _C =125℃	-	-	1	mA
Gate-body leakage current	I _{GES}	V _{CE} =0V,V _{GE} =±30V	-	-	±400	nA
On-Characteristics						
Gate Threshold Voltage	V _{GE(th)}	V _{CE} =V _{GE} ,I _C =250μA	3.9	5.1	6.3	V
Collector-Emitter saturation Voltage	V _{CESAT}	V _{GE} =15V I _C =75A	-	1.26	-	V
		V _{GE} =15V I _C =75A,T _C =125℃	-	1.6	-	V
Dynamic Characteristics						
Input capacitance	C _{ies}	V _{CE} =30V, V _{GE} =0V, f=1.0MHz	-	3764	-	pF
Output capacitance	C _{oes}		-	295	-	pF
Reverse transfer capacitance	C _{res}		-	182	-	pF

Electrical Characteristics

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{CC}=200V, I_C=120A,$ $R_G=5\Omega, V_{GE}=15V,$ Inductive Load $T_C=25^{\circ}C$	-	35	-	ns
Turn-On rise time	t_r		-	134	-	ns
Turn-Off delay time	$t_{d(off)}$		-	102	-	ns
Turn-Off Fall time	t_f		-	115	-	ns
Turn-on Loss	E_{on}		-	6.8	-	mJ
Turn-off Loss	E_{off}		-	3.5	-	mJ
Total Loss	E_{ts}		-	10.3	-	mJ
Turn-on delay time	$t_{d(on)}$	$V_{CC}=200V, I_C=120A,$ $R_G=5\Omega, V_{GE}=15V,$ Inductive Load $T_C=175^{\circ}C$	-	33	-	ns
Turn-On rise time	t_r		-	130	-	ns
Turn-Off delay time	$t_{d(off)}$		-	106	-	ns
Turn-Off Fall time	t_f		-	130	-	ns
Turn-on switching Loss	E_{on}		-	10.2	-	mJ
Turn-off switching Loss	E_{off}		-	10.5	-	mJ
Total switching Loss	E_{ts}		-	20.7	-	mJ
Gate Charge	Q_g	$V_{CC}=200V, I_C=60A$ $V_{GE}=15V$	-	185	-	nC
Gate to Emitter Charge	Q_{ge}		-	29	-	nC
Gate to Collector Charge	Q_{gc}		-	78	-	nC

Anti-Parallel Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_F	$I_F=30A$	-	0.95	1.2	V
Diode Reverse Recovery Time	t_{rr}	$I_F=30A$ $-di_F/dt=100A/us$ $T_J=25^{\circ}C$	-	33	-	ns
Diode Peak Reverse Recovery Current	I_{rr}		-	8	-	A
Diode Reverse recovery charge	Q_{rr}		-	50	-	nC
Diode Reverse recovery time	t_{rr}	$I_F=30A$ $di_F/dt=100A/us$ $T_J=125^{\circ}C$	-	40	-	ns
Diode Peak Reverse Recovery Current	I_{rr}		-	10	-	A
Diode Reverse recovery charge	Q_{rr}		-	63	-	nC

Thermal Characteristic

Parameter	Symbol	Max	Unit
Thermal Resistance,Junction to Case (IGBT),Max	$R_{th(j-c)}$	0.18	$^{\circ}C/W$
Thermal Resistance,Junction to Case (Diode),Max	$R_{th(j-c)}$	0.32	$^{\circ}C/W$
Thermal Resistance,Junction to Ambient,Max	$R_{th(j-A)}$	40	$^{\circ}C/W$

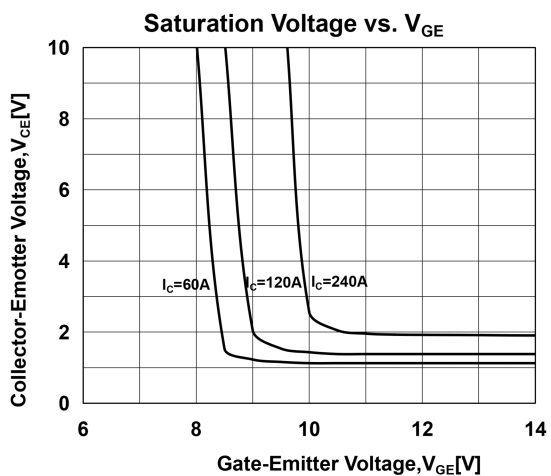
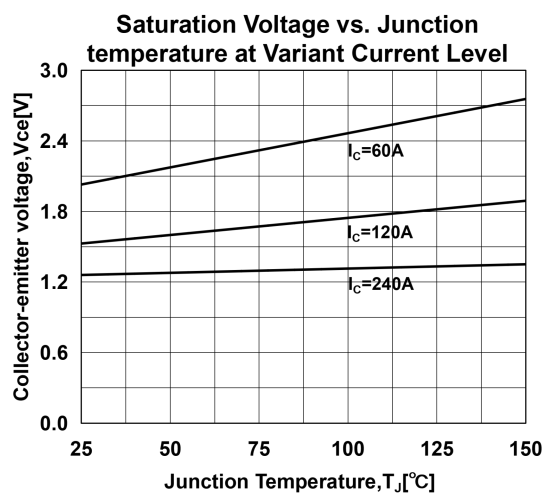
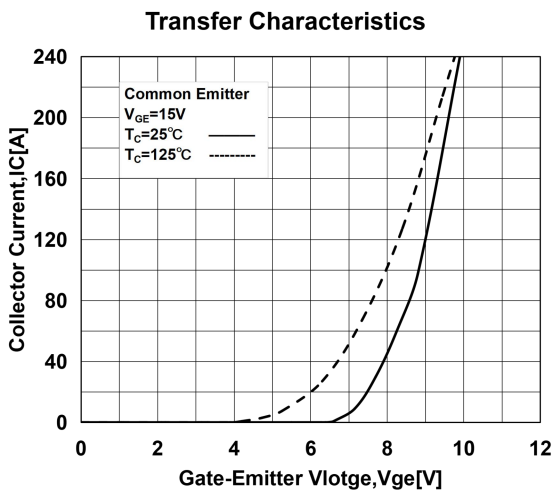
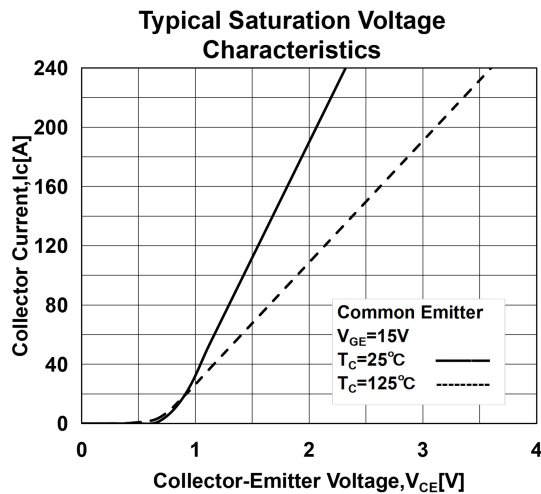
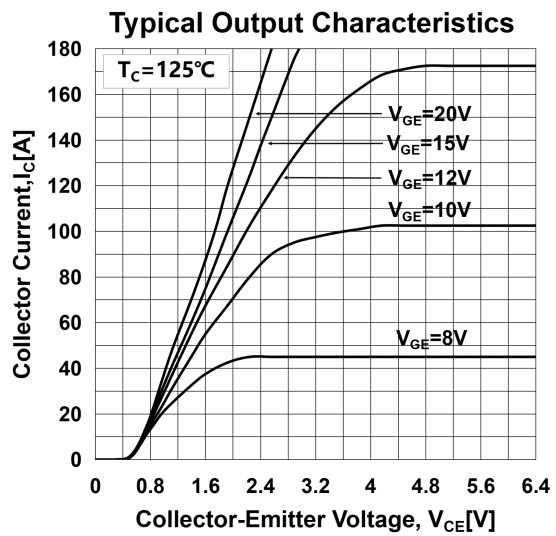
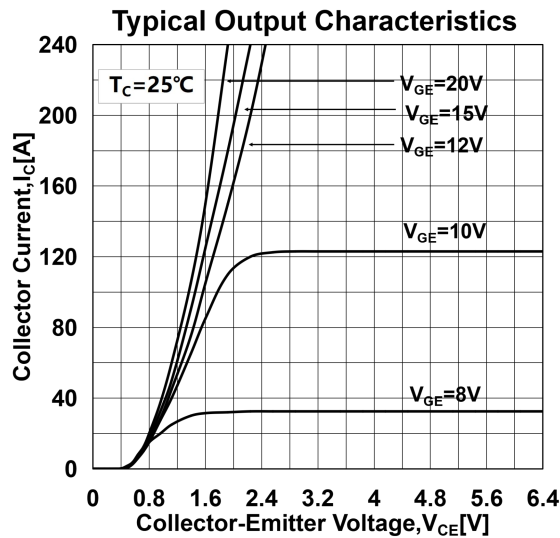
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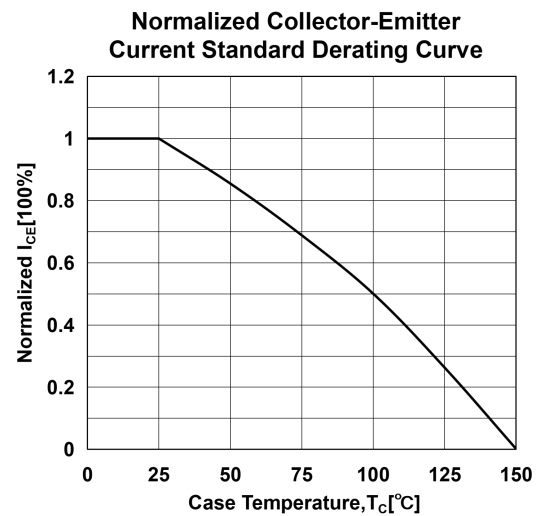
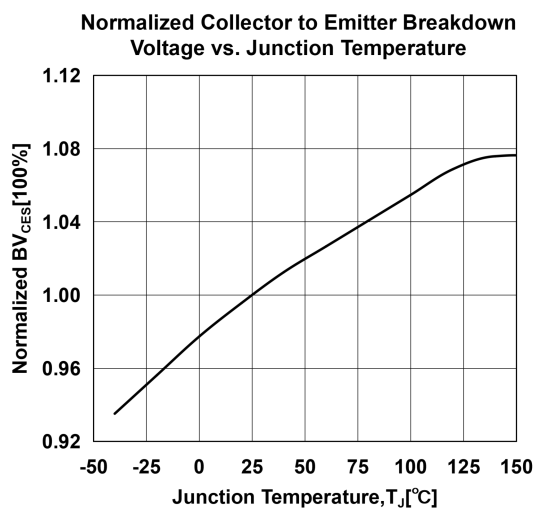
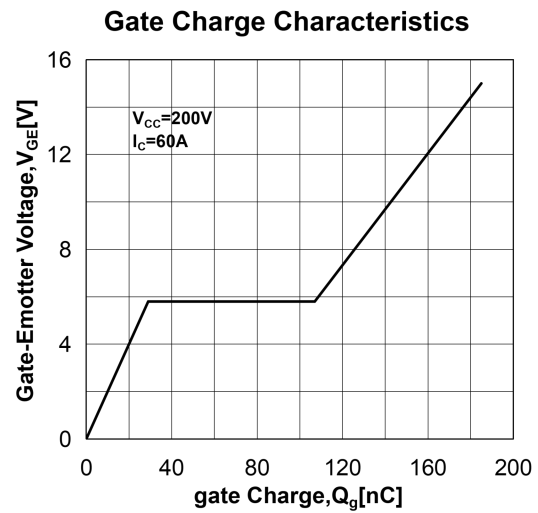
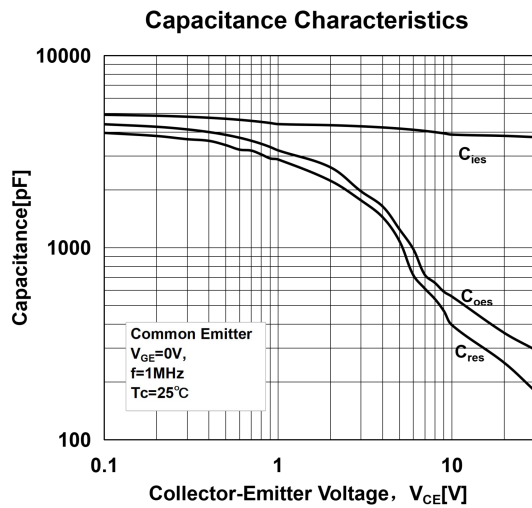
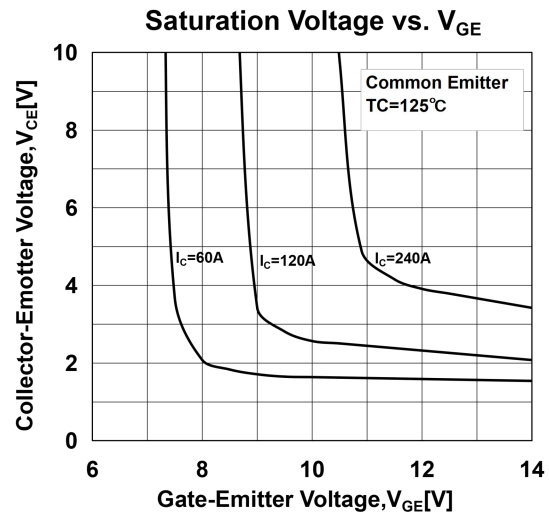
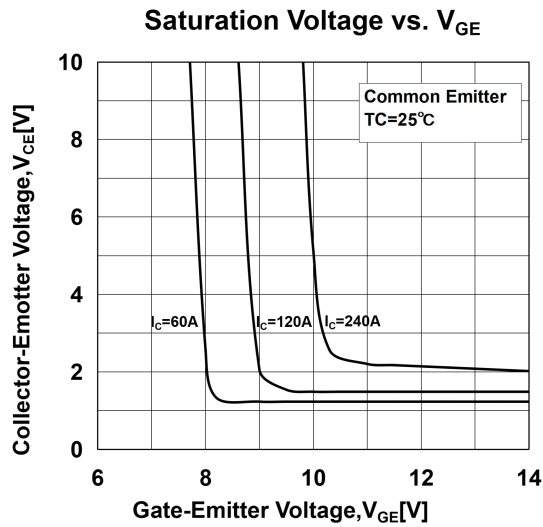
1. Repetitive Rating: Pulse width limited by maximum junction temperature

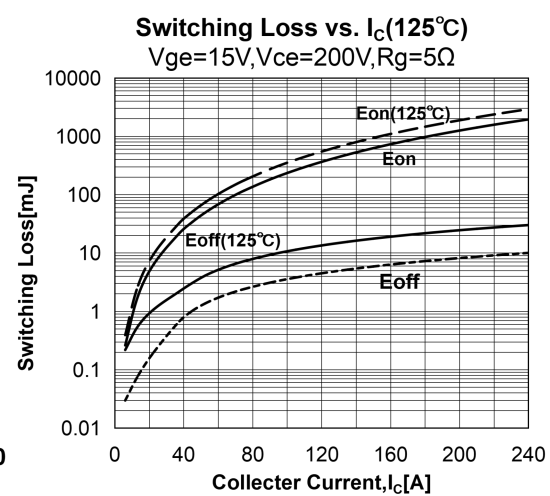
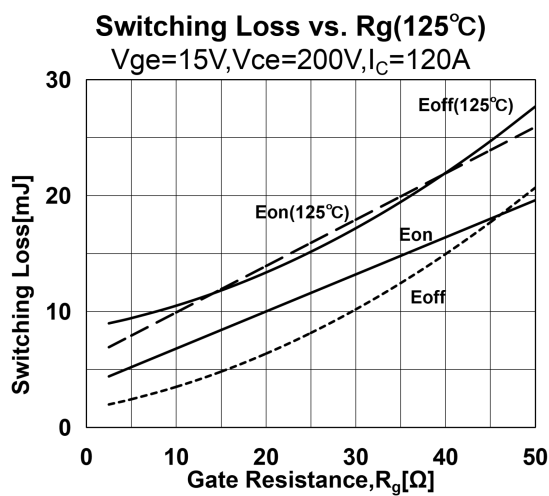
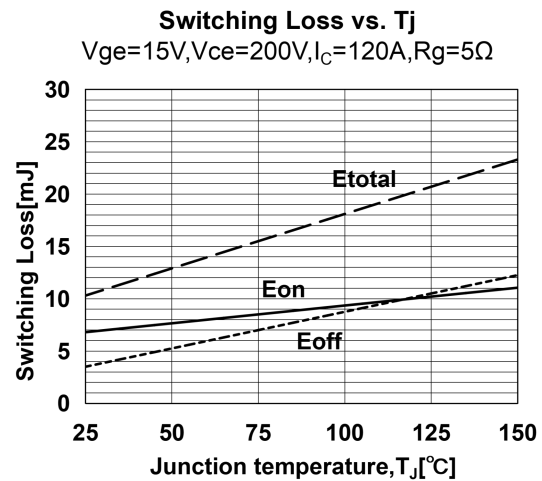
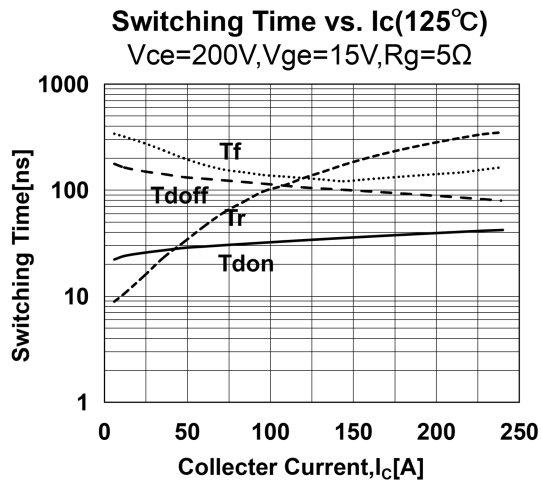
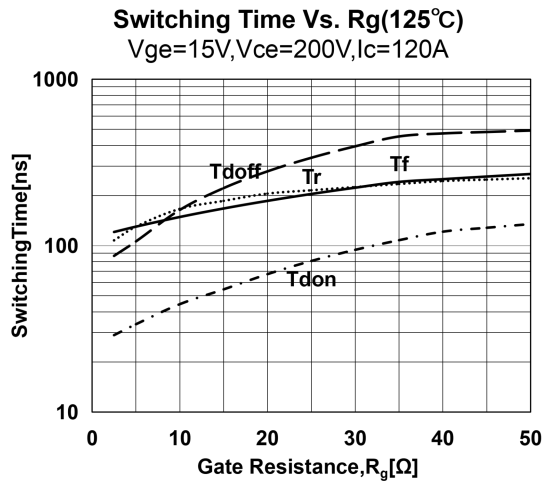
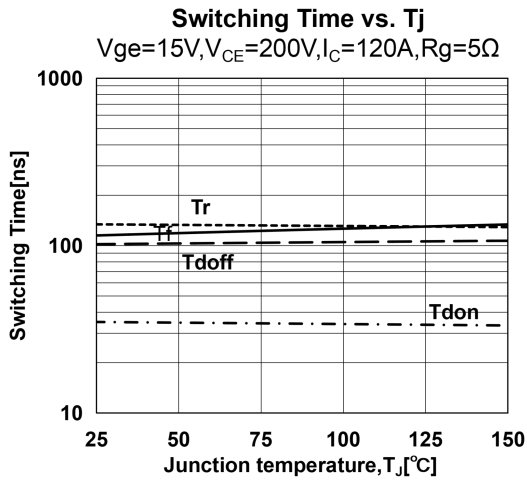
Order Information

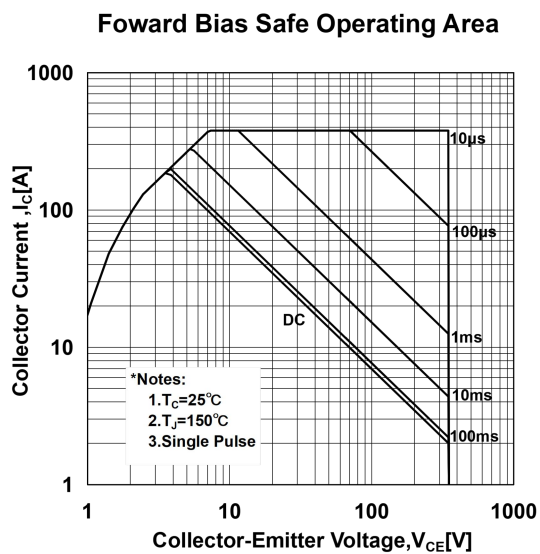
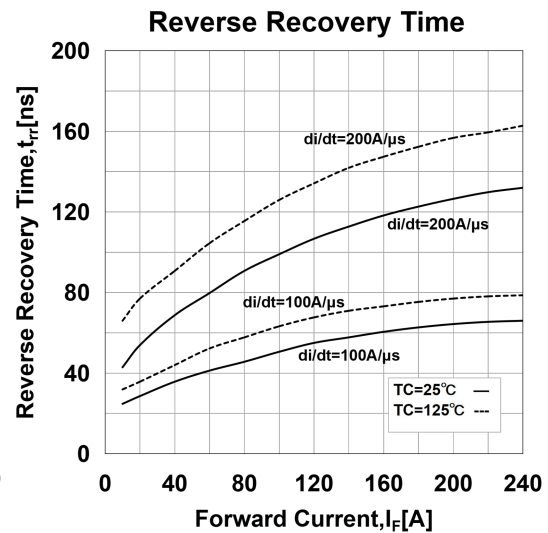
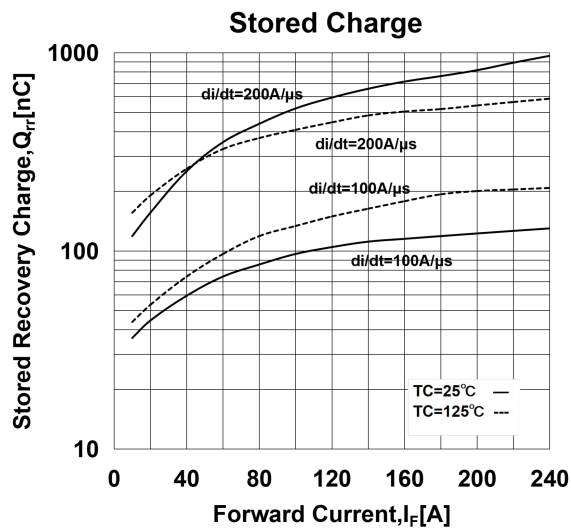
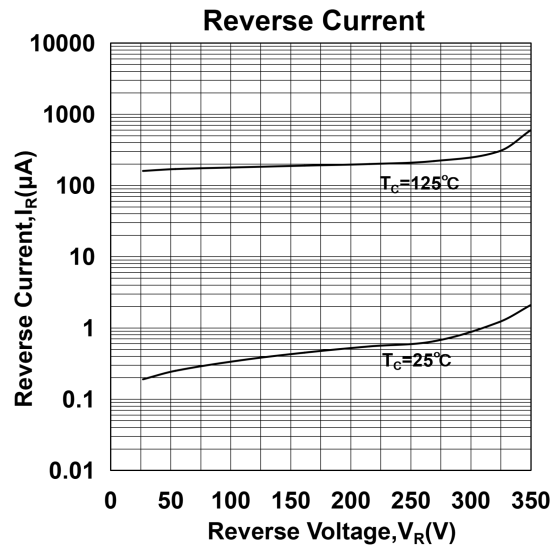
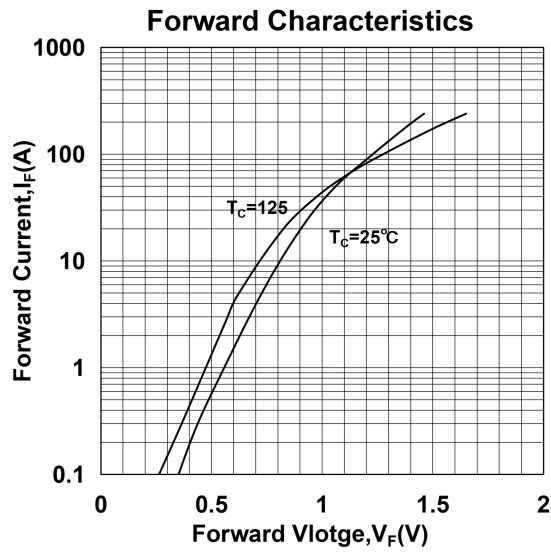
Making	Package
MSG120N35HLB3	TO-264

Electrical Characteristics(curves)

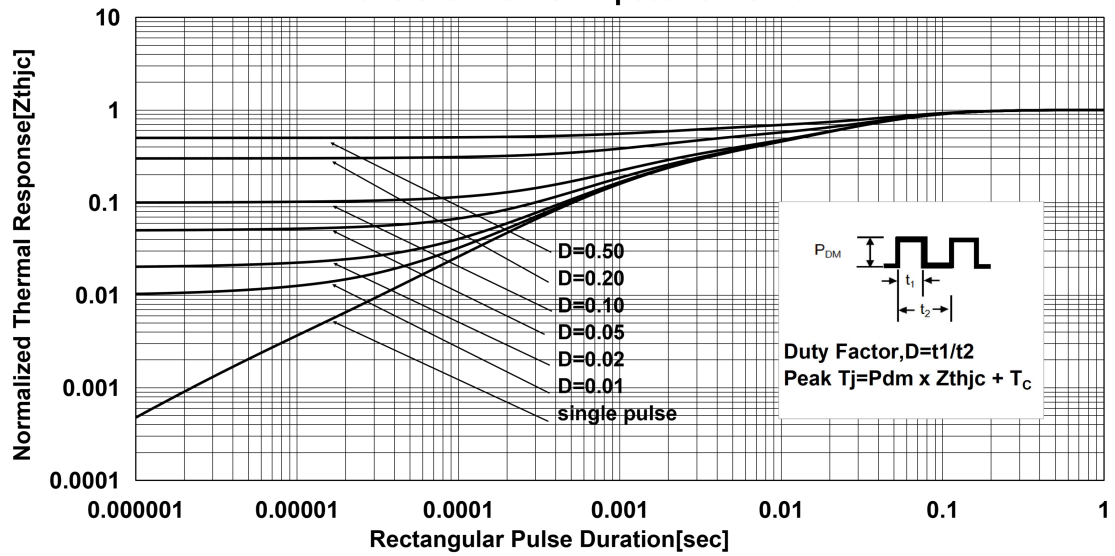




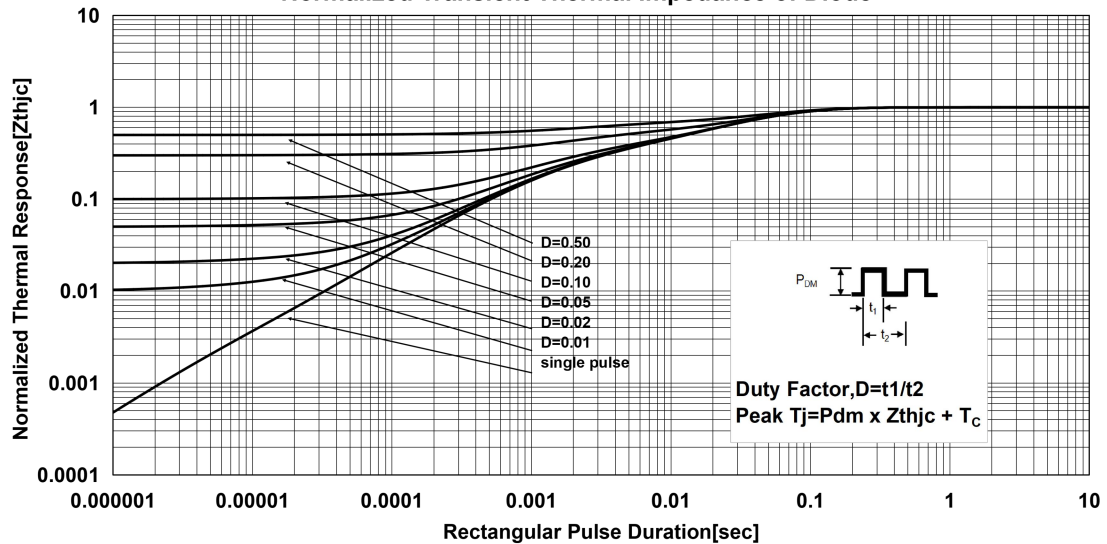




Transient Thermal Impedance for IGBT



Normalized Transient Thermal Impedance of Diode



Package Mechanical DATA

