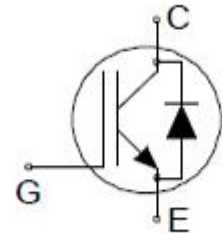
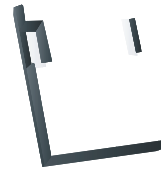



IGBT

- 650V/40A
 $V_{CE(sat)} = 1.65V(\text{typ.}) @ I_C = 40A$
- Positive temperature coefficient
- Fast Switching
- Low $V_{CE(sat)}$
- Reliable and Rugged
- Halogen Free and Green Devices Available
 (RoHS Compliant)
- Motor drives
- Solar Inverter
- Resonant converters



 <p>W HYG40T65 XYMXXX</p>	<p>Package Code W:TO-247-3L Date Code XYMXXX</p>
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Note: HUAYI halogen free products contain molding compounds/die attach materials and 100% matte tin plate Termination finish; which are fully compliant with RoHS. HUAYI halogen free products meet or exceed the halogen free requirements of IPC/JEDEC J-STD-020 for MSL classification at halogen free peak reflow temperature. HUAYI defines "Green" to mean halogen free (RoHS compliant) and halogen free (Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight).


HUAYI reserves the right to make changes, corrections, enhancements, modifications, and improvements to this product and/or to this document at any time without notice.

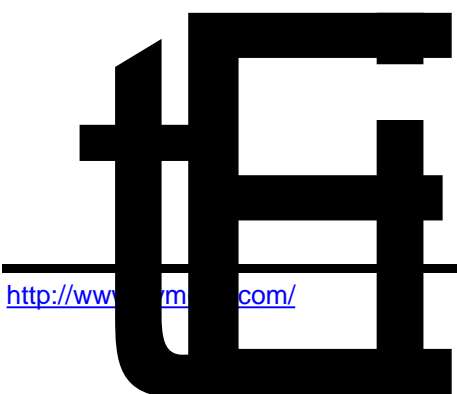


(Tc=25°C Unless Otherwise Noted)	
V _{CES}	Collector-Emitter Voltage
V _{GES}	Gate-Emitter Voltage
T _J	Junction Temperature Range
T _{STG}	Storage Temperature Range
I _{CM}	Pulsed Collector Current *
I _C	Continuous Drain Current
I _{FM}	Diode Maximum Forward Current
I _F	Diode Continuous Forward Current
R _{θJC}	Thermal Resistance Junction-Case
R _{θJC}	Thermal Resistance Junction-Case
R _{θJA}	Thermal Resistance Junction-Ambient
	°C/W

Note: * Repetitive

(Tc =25°C Unless Otherwise Noted)

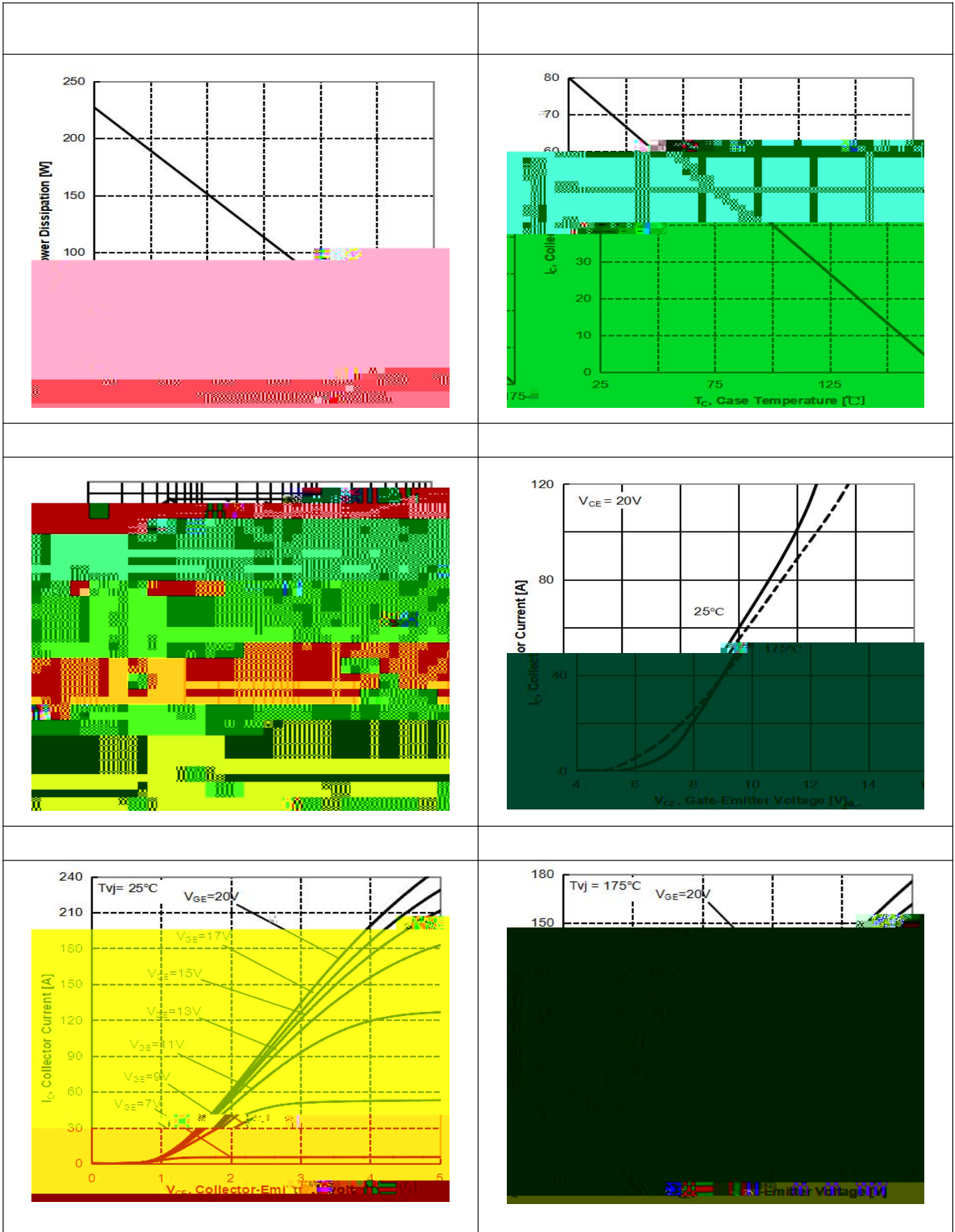

 BV_{CES} Collector-Emitter

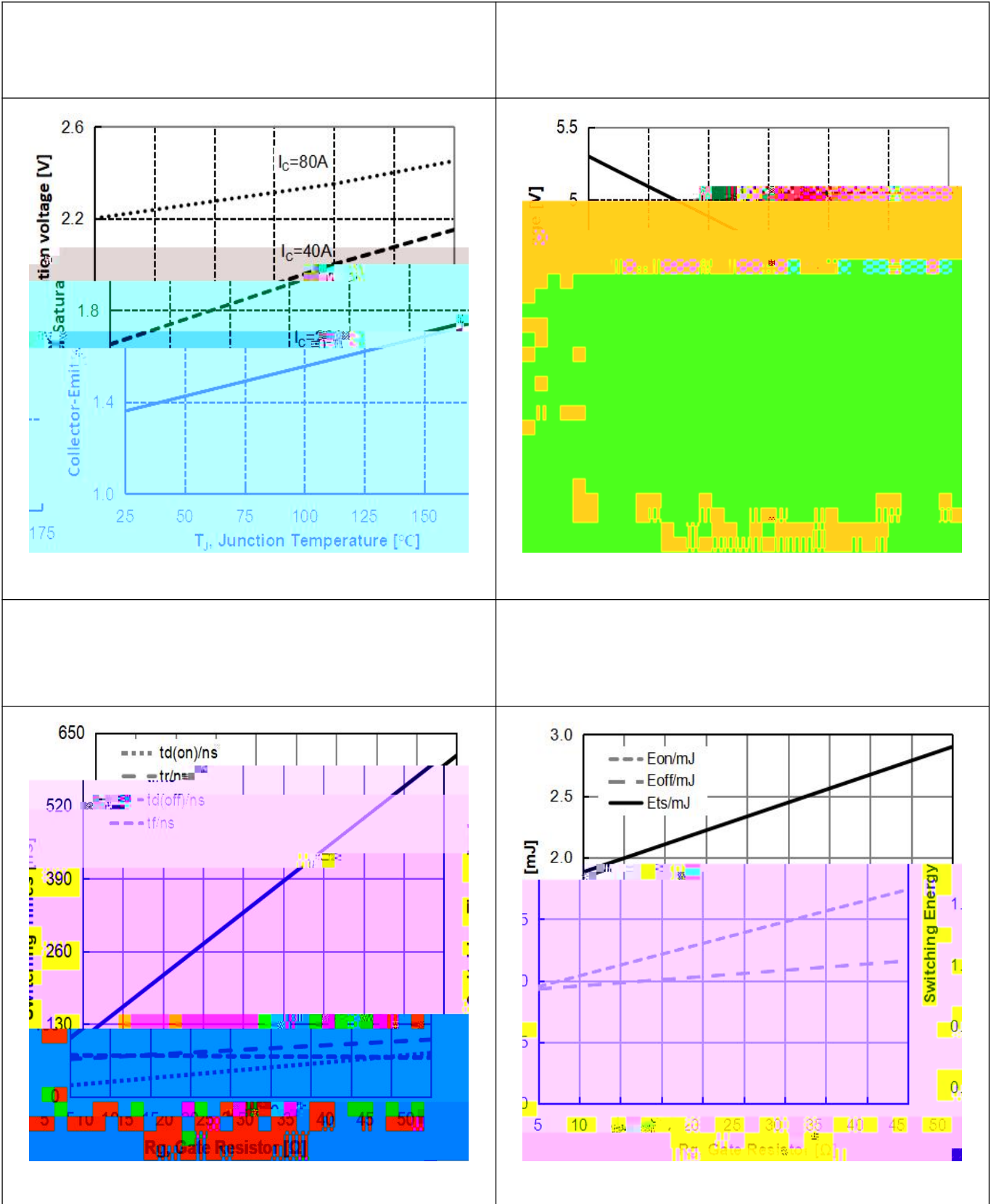


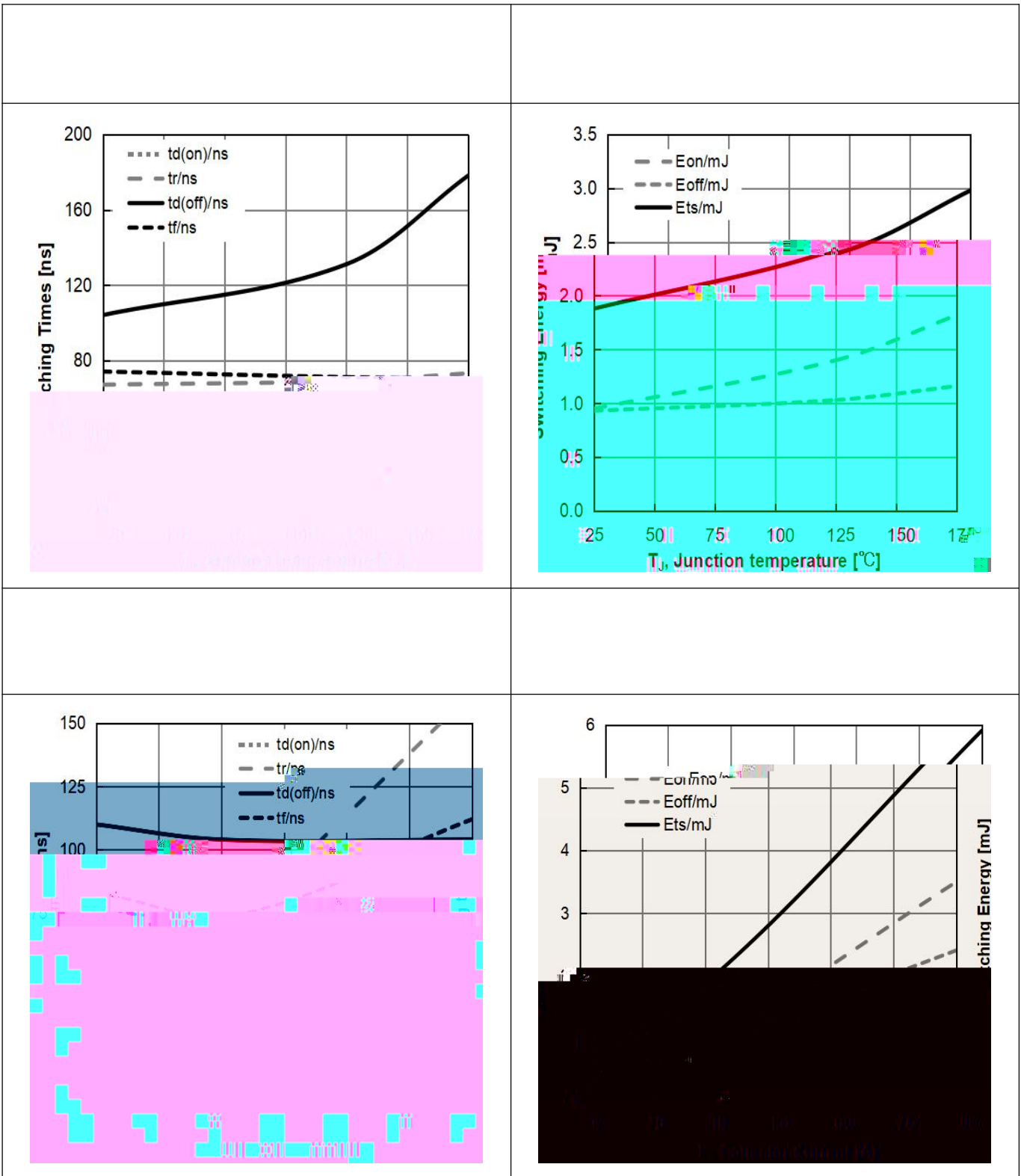
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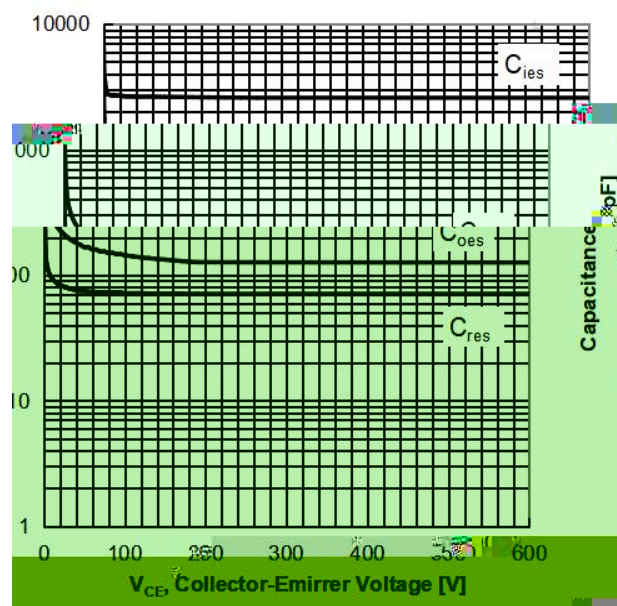
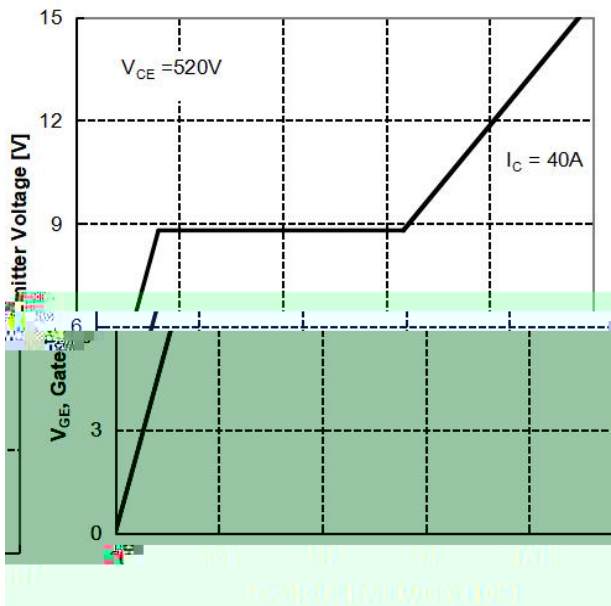
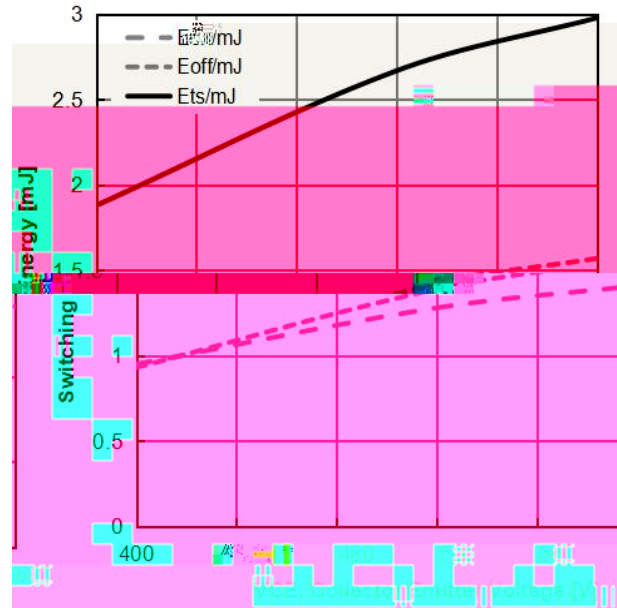
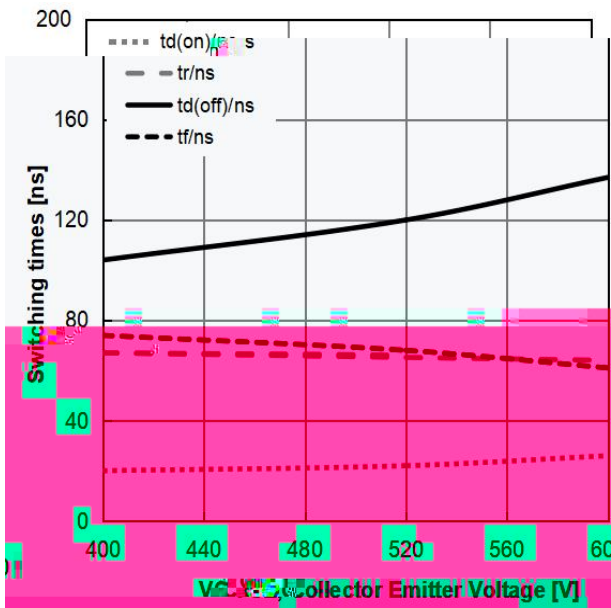
C_{ies}	Input Capacitance	$V_{GE}=0V$	-	2540	-	pF
C_{oes}	Output Capacitance	$V_{CE}=25V$	-	126	-	
C_{res}	Reverse Transfer Capacitance	Frequency=1MHz	-	67	-	
Q_g	Total Gate Charge	$V_{CC}=520V$	-	146	-	nC
Q_{ge}	Gate- Emitter Charge	$I_C=40A$	-	24	-	
Q_{gc}	Gate- Collector Charge	$V_{GE}=15V$	-	71	-	
$t_{(SC)}$	Short circuit collector current Max.1000 short circuits, times between short circuits: 1.0s	$V_{GE}=15V, V_{CC} 400V$ $T_J 175^{\circ}C$	-	8	-	μs
$t_{d(ON)}$	Turn-on Delay Time	$I_C=40A$ $V_{CC}=400V$ $V_{GE}=15V$ $R_g=5$	-	20	-	ns
t_r	Turn-on Rise Time		-	67	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	104	-	
t_f	Turn-off Fall Time		-	74	-	
E_{on}	Turn-On Switching Loss	$T_J=25^{\circ}C$	-	0.95	-	mJ
E_{off}	Turn-Off Switching Loss	Inductive Load	-	0.93	-	
E_{ts}	Total Switching Loss		-	1.88	-	
$t_{d(ON)}$	Turn-on Delay Time	$I_C=40A$ $V_{CC}=400V$ $V_{GE}=15V$ $R_g=5$	-	22	-	ns
t_r	Turn-on Rise Time		-	73	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	178	-	
t_f	Turn-off Fall Time		-	70	-	
E_{on}	Turn-On Switching Loss	$T_J=175^{\circ}C$	-	1.82	-	mJ
E_{off}	Turn-Off Switching Loss	Inductive Load	-	1.16	-	
E_{ts}	Total Switching Loss		-	2.98	-	
t_{rr}	Reverse Recovery Time	$I_F=40A$ $di/dt=200A/\mu s$	-	188	-	ns
Q_{rr}	Reverse Recovery Charge		-	243	-	nC
I_{rrm}	Reverse Recovery Current		-	6.8	-	A
t_{rr}	Reverse Recovery Time	$I_F=40A$ $di/dt=200A/\mu s$	-	215	-	ns
Q_{rr}	Reverse Recovery Charge		-	278	-	nC
I_{rrm}	Reverse Recovery Current		-	9.7	-	A

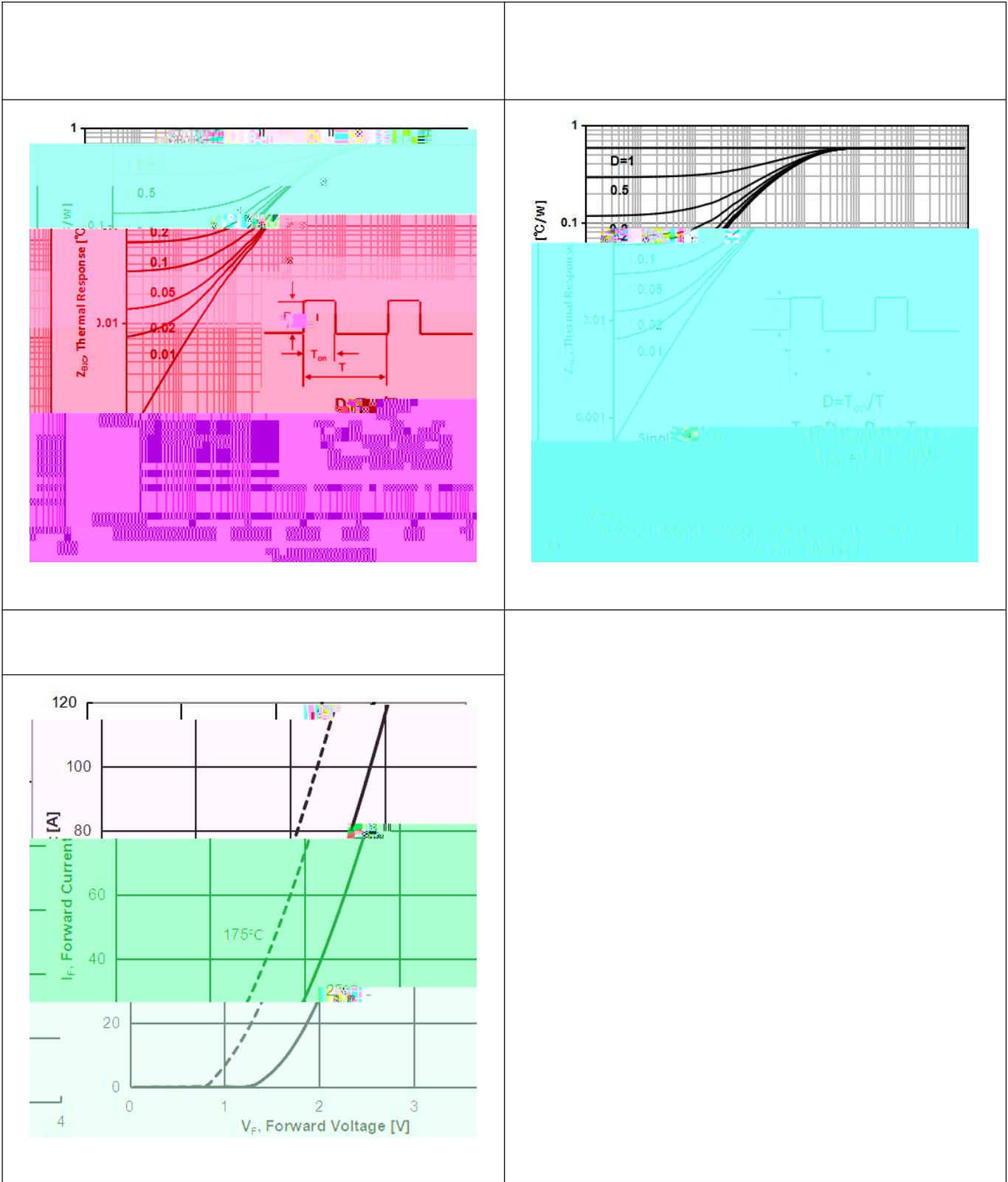
Note: *Pulse test pulse width 300us duty cycle 2%

















Temperature min (T_{smin})	100 °C	150 °C
Temperature max (T_{smax})	150 °C	200 °C
Time (T_{smin} to T_{smax}) (T_s)	60-120 seconds	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max.	3°C/second max.
Liquidous temperature (T_L)	183 °C	217 °C
Time at liquidous (t_L)	60-150 seconds	60-150 seconds

Peak package body temperature (T _p)*	See Classification Temp in table 1	See Classification Temp in table 2
Time (T _p)** within 5°C of the specified classification temperature (T _c)	20** seconds	30** seconds
Average ramp-down rate (T _p to T _{smax})	6 °C/second max.	6 °C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.
*Tolerance for peak profile Temperature (T _p) is defined as a supplier minimum and a user maximum.		
** Tolerance for time at peak profile temperature (t _p) is defined as a supplier minimum and a user maximum.		

Table 1.Sn-Pb Eutectic Process – Classification Temperatures (T_c)

2.5 mm	235 °C	220 °C
2.5 mm	220 °C	220 °C

Table 2.Pb-free Process – Classification Temperatures (T_c)

<1.6 mm	260 °C	260 °C	260 °C
1.6 mm – 2.5 mm	260 °C	250 °C	245 °C
2.5 mm	250 °C	245 °C	245 °C

HTRB	JESD-22, A108	168/500 Hrs, Bias @ 150°C
HTGB	JESD-22, A108	168 /500 Hrs, 100%V _{GE} @ 150°C
PCT	JESD-22, A102	96 Hrs, 100%RH, 2atm, 121°C
TCT	JESD-22, A104	250/500 Cycles, -55°C~150°C

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