

/ Absolute Maximum Ratings($T_a=25^\circ\text{C}$)

Parameter		Symbol	Rating	Unit
Collector-Emitter Voltage		V_{CES}	650	V
Gate-Emitter Voltage		V_{GES}	± 30	V
Continuous Collector Current	$T_C=25$	I_C	80	A
	$T_C=100$		40	A
Pulsed Collector Current , Limited by T_{Jmax}		I_{CM}	160	A
Continuous Diode Forward Current	$T_C=25$	I_F	80	A
	$T_C=100$		40	A
Diode Repetitive Peak Forward Current		I_{FRM}	160	A
Short circuit withstand time		t_{sc}	9	μs
Power Dissipation	$T_C=25$	P_D	395	W
Storage Temperature Range		T_{STG}	-55 to +175	
Maximum Temperature for Soldering		T_L	260	
Maximum Junction-to-Ambient		$R_{\theta JA}$	40	$^{\circ}\text{C}/\text{W}$
Maximum IGBT Junction-to-Case		$R_{\theta JC}$	0.31	$^{\circ}\text{C}/\text{W}$
Maximum Diode Junction-to-Case		$R_{\theta JC}$	0.55	$^{\circ}\text{C}/\text{W}$

/ Electrical Characteristics($T_c=25^\circ\text{C}$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage	BV_{CES}	$I_C=1\text{mA}$ $V_{GE}=0\text{V}$	650			V
Zero Gate Voltage Collector current	I_{CES}	$V_{CE}=650\text{V}$, $V_{GE}=0\text{V}$			10	μA
Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0\text{V}$, $V_{GE}=\pm 20\text{V}$			± 200	nA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=0\text{V}$, $I_C=1\text{mA}$	4.3	5.3	6.3	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15\text{V}$, $I_C=40\text{A}$	$T_J=25$	1.30	1.60	V
			$T_J=125$	1.50		
			$T_J=175$	1.68		
Total Gate Charge	Q_g	$V_{GE}=15\text{V}$, $V_{CC}=520\text{V}$ $I_C=40\text{A}$		320		nC
Gate to Emitter Charge	Q_{ge}			30		
Gate to Collector Charge	Q_{gc}			35		

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Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Turn-On Delay Time	t _{d(on)}	V _{GE} =15V, V _{CE} =400V I _C =40A, R _G =5Ω Inductive Load	T _C =25		32		ns
			T _C =175		30		
Turn-On Rise Time	t _r		T _C =25		25		ns
			T _C =175		27		
Turn-Off Delay Time	t _{d(off)}		T _C =25		187		ns
			T _C =175		202		
Turn-Off Fall Time	t _f		T _C =25		15		ns
			T _C =175		18		
Turn-On Energy	E _{on}		T _C =25		0.95		mJ
			T _C =175		1.45		
Turn-Off Energy	E _{off}		T _C =25		0.65		mJ
			T _C =175		1.20		
Total Switching Energy	E _{ts}		T _C =25		1.60		mJ
			T _C =175		2.65		
Input Capacitance	C _{ies}	V _{GE} =0V, V _{CE} =25V f=1MHz			5660		pF
Output Capacitance	C _{oes}				260		pF
Reverse Transfer Capacitance	C _{res}				154		pF
			T _J =25		1.30	1.60	
Diode Forward Voltage	V _F	I _F =40A	T _J =150		1.18		V

/ Electrical Characteristic Curve

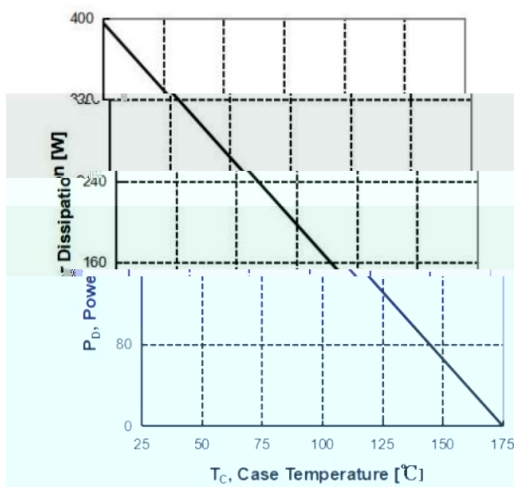


Fig. 1 TYP. Power Dissipation

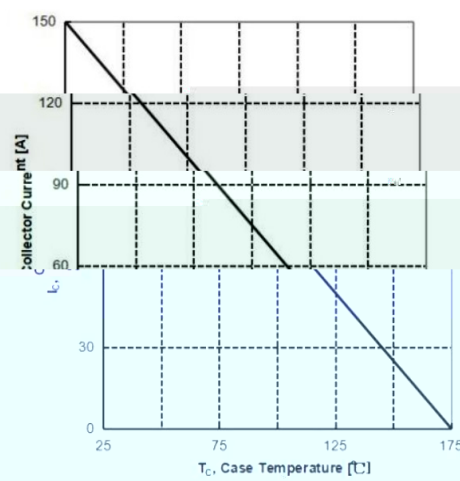


Fig. 2 Collector Current vs. Case Temperature

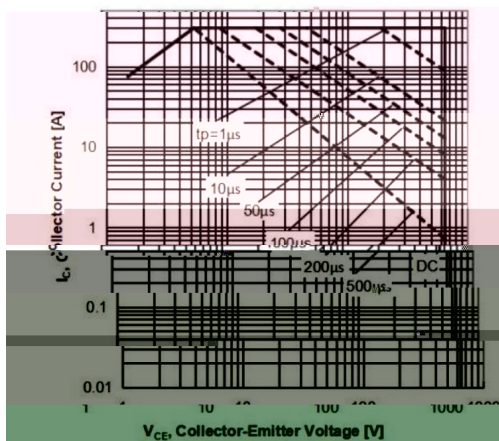


Fig. 3 Safe Operating Area

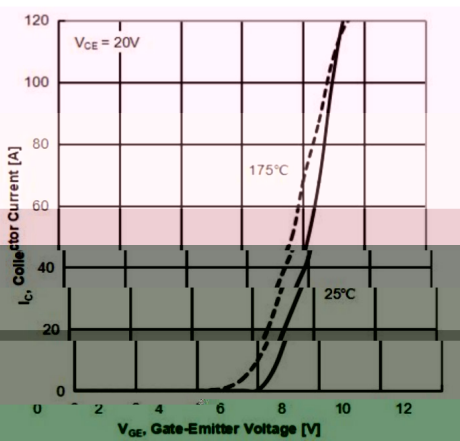


Fig. 4 TYP. Transfer Characteristics

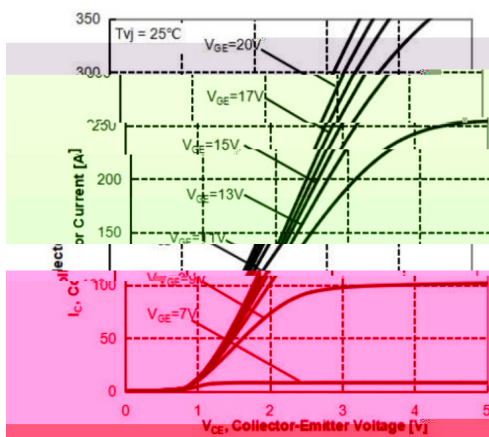


Fig. 5 TYP. Output Characteristics

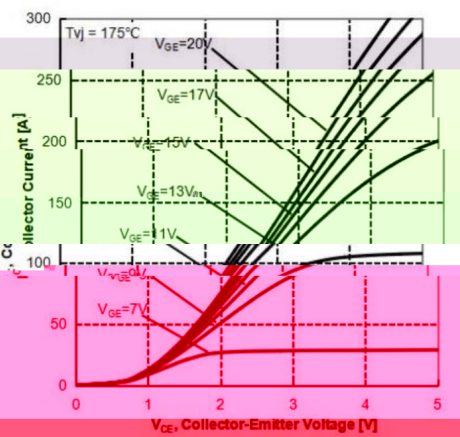


Fig. 6 Output Characteristics

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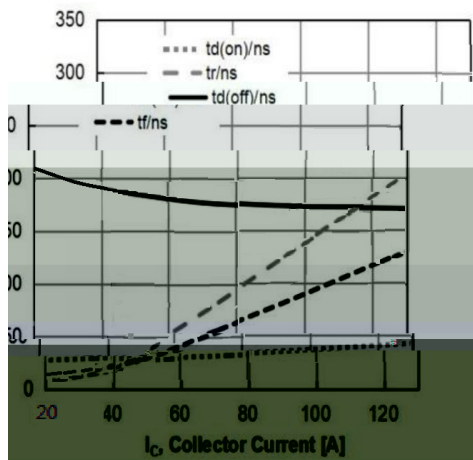


Fig. 13 TYP. Switching Times vs. Collector Current

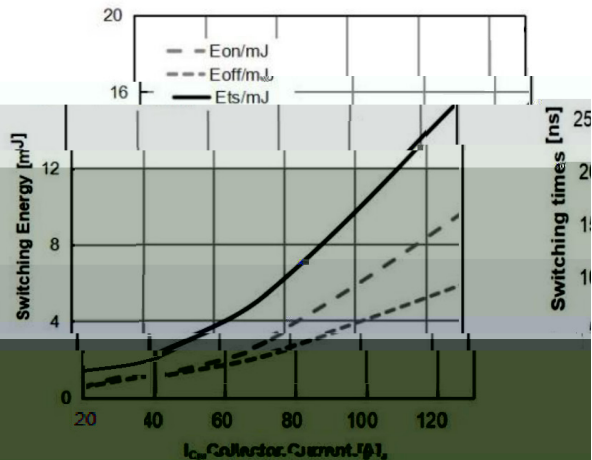


Fig. 14 TYP. Switching Energy vs. Collector Current

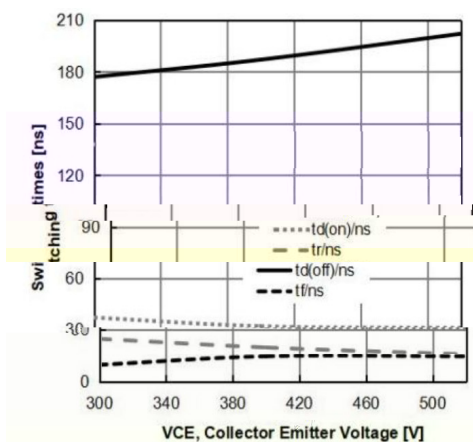
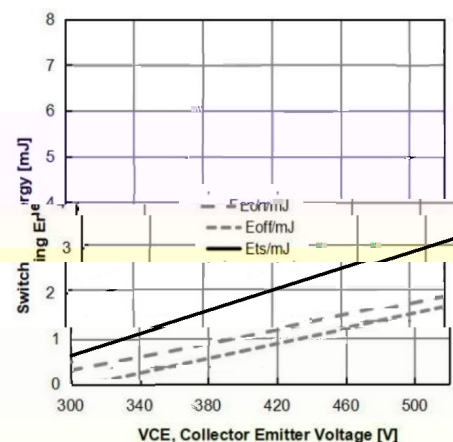
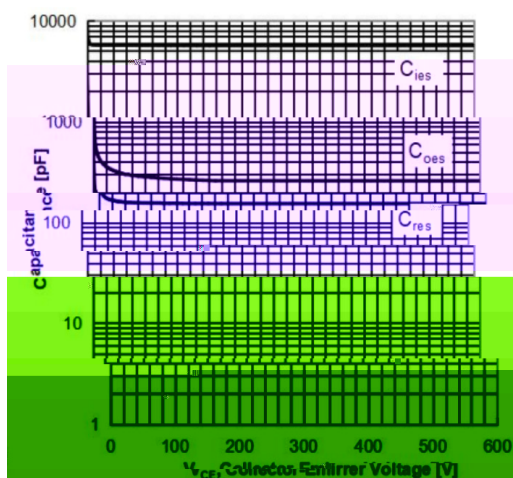
Fig. 15 TYP. Switching Times vs. VCE
($T_J=25^{\circ}\text{C}$, $I_C=40\text{A}$, $V_{GE}=15\text{V}$, $R_G=5\Omega$)Fig. 16 TYP. Switching Energy vs. VCE
($T_J=25^{\circ}\text{C}$, $I_C=40\text{A}$, $V_{GE}=15\text{V}$, $R_G=5\Omega$)

Fig. 17 TYP. Capacitance

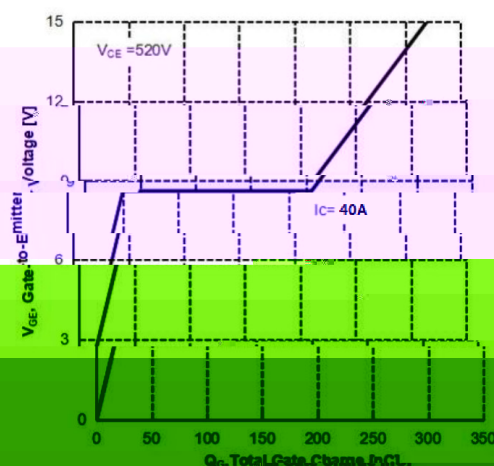
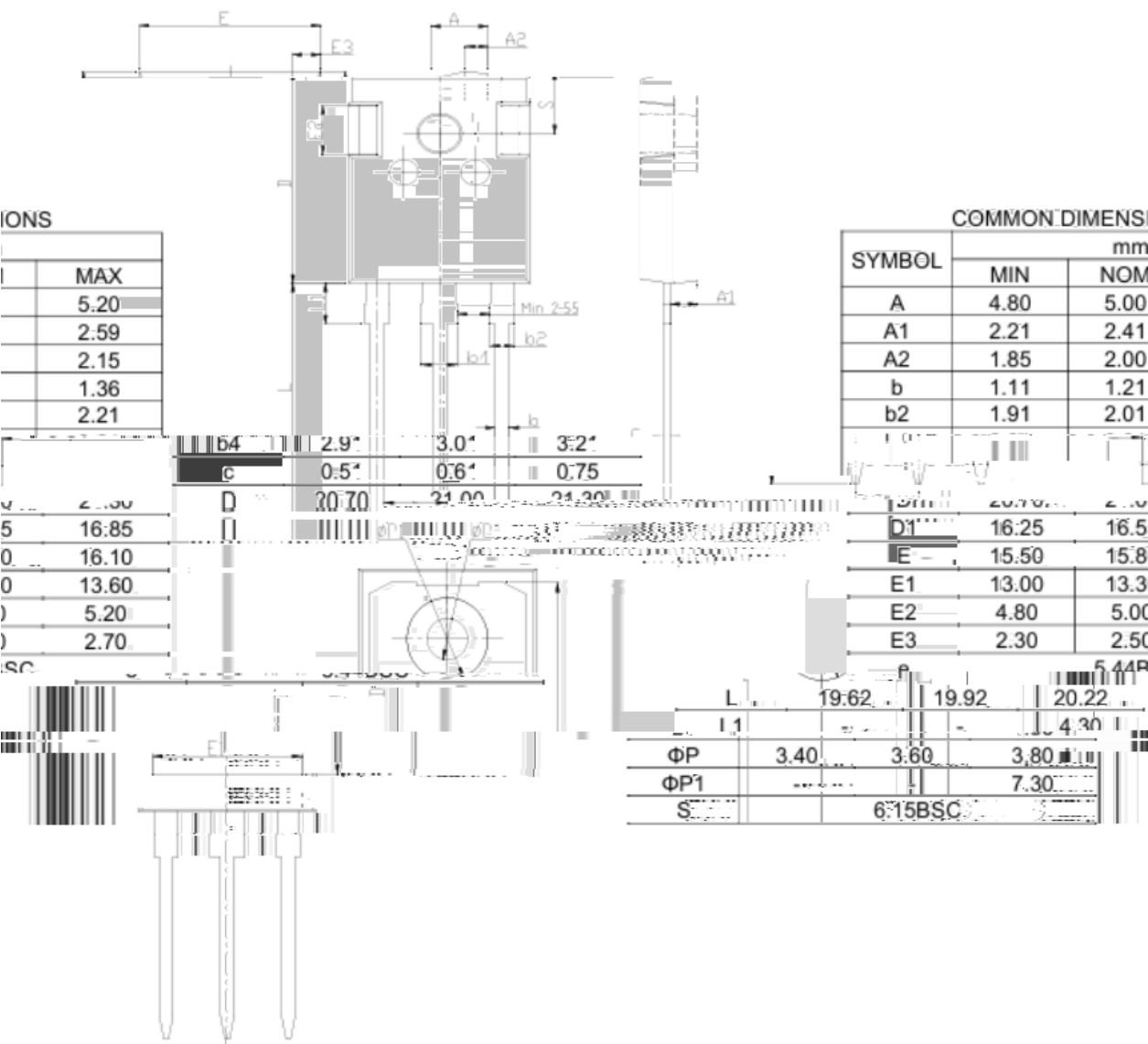


Fig. 18 TYP. VGE vs. QG

/ Electrical Characteristic Curve



/ Package Dimensions



/ Marking Instructions



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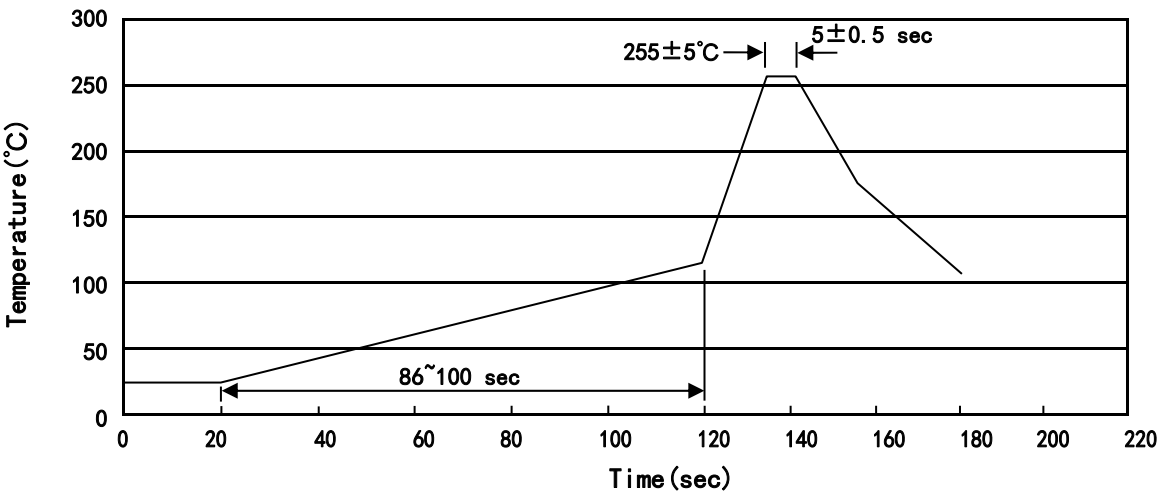
Note:

BR: Company Code

GB40N65AHA: Product Type Code

****: Lot No. Code, code change with Lot No.

() / Temperature Profile for Dip Soldering(Pb-Free)



Note:

- 1

25 150

60 90sec;

1.Preheating:25~150 , Time:60~90sec.
- 2

255±5

5±0.5sec;

2.Peak Temp.:255±5 , Duration:5±0.5sec.
- 3

2 10 /sec.

3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

270±5 10±1 sec. Temp.:270±5 Time:10±1 sec

/ Packaging SPEC.

/ TUBE

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm³)		
	Units/Tube 只/套管	Tubes/Inner Box 套管/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Tube 套管	Inner Box 盒	Outer Box 箱
TO-247	30	15	450	5	2250	520×44×6	580×158×55	595×300×178

/ Notices

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