

# 8jgWfYhY' = ; 6H'fl<][ \!GdYYX' K' gYf]Ygk

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%&\$\$J'#' (\$5

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%&\$\$J'#' (\$5

**■ : YUhi fYg**

- Low power loss
- Low switching surge and noise
- High reliability, high ruggedness (RBSOA, SCSOA etc.)

**■ 5dd`JWUh]cbg**

- Uninterruptible power supply
- PV Power conditioner
- Inverter welding machine



**■ 9e i] jU'Ybh'W]fw i]h**

**■ AU]a i a'FUh]b [g'UbX'7 \UfUWhYf]gh]Wg**

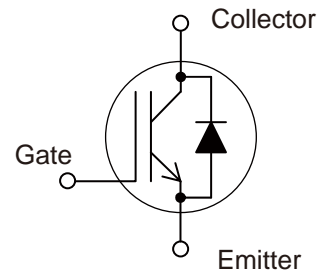
● 5Vgc' i hY'AU]a i a'FUh]b [g'fUh'H.1&)s7' i b'Ygg'ch \Yf k]gY'gdYW]U'YXt

hYag	Gma Vc'g	7 \UfUWhYf]gh]Wg	I b]h	FY aUf'g
7c''YWhcf!9 a]hhYf'jc'hU[Y	V <sub>GES</sub>	1200	V	
; UhY!9 a]hhYf'jc'hU[Y	V <sub>GES</sub>	±20	V	
87'7c''YWhcf'7 iffYbh	I <sub>C@25</sub>	65	A	T <sub>C</sub> =25°C, T <sub>J</sub> =150°C
	I <sub>C@100</sub>	40	A	T <sub>C</sub> =100°C, T <sub>J</sub> =150°C
Di'gYX'7c''YWhcf'7 iffYbh	I <sub>CP</sub>	160	A	Note *1
Hifb!CZ'GUZY'CdYfU]b [ '5fYU	-	160	A	V <sub>CE</sub> 1200V, T <sub>J</sub> 175°C
8]cXY' : cfkUfX'7 iffYbh	I <sub>F@25</sub>	36	A	
	I <sub>F@100</sub>	20	A	
8]cXY'Di'gYX'7 iffYbh	I <sub>FP</sub>	160	A	Note *1
G\cfh'7]fW i]h'K]h\ghUbX'H]aY	t <sub>SC</sub>	5	μs	V <sub>CC</sub> 600V, V <sub>GE</sub> =15V T <sub>J</sub> 150°C
= ; 6H'AU]'DckYf'8]gg]dU]h]cb	P <sub>D,IGBT</sub>	430	W	T <sub>C</sub> =25°C
: K'8'AU]'DckYf'8]gg]dU]h]cb	P <sub>D,FWD</sub>	125	W	T <sub>C</sub> =25°C
CdYfU]b [ '> i bWh]cb'HY a dYfUhi fY	T <sub>J</sub>	-40~+175	°C	
GhcfU[Y'HY a dYfUhi fY	T <sub>sig</sub>	-55~+175	°C	

Note \*1 : Pulse width limited by T<sub>Jmax</sub>.

● 9'Ywhf]WU'W \UfUWhYf]gh]Wg'fUh'H.1&)s7' i b'Ygg'ch \Yf k]gY'gdYW]U'YXt

8YgWf]dh]cb	Gma Vc'g	7cbX]h]cbg	7 \UfUWhYf]gh]Wg			I b]h	
			a]b'	hmd'	aU1'		
NYfc' ; UhY'Jc'hU[Y'7c''YWhcf'7 iffYbh	I <sub>CES</sub>	V <sub>CE</sub> = 1200V, V <sub>GE</sub> = 0V	T <sub>J</sub> =25°C	-	250	μA	
			T <sub>J</sub> =175°C	-	2	mA	
; UhY!9 a]hhYf'@YU_U[Y'7 iffYbh	I <sub>GES</sub>	V <sub>CE</sub> = 0V, V <sub>GE</sub> = ±20V	-	-	200	nA	
			5.0	6.0	7.0	V	
; UhY!9 a]hhYf'H\Yfg\c'X'Jc'hU[Y	V <sub>GE(TH)</sub>	V <sub>CE</sub> = 20V, I <sub>C</sub> = 40mA	-	2.0	2.6	V	
			T <sub>J</sub> =25°C	-	2.6	-	
7c''YWhcf!9 a]hhYf'GUh i fU]h]cb'Jc'hU[Y	V <sub>CE(sat)</sub>	V <sub>GE</sub> = 15V, I <sub>C</sub> = 40A	T <sub>J</sub> =25°C	-	2.6	-	
			T <sub>J</sub> =175°C	-	2.6	-	
-bd i h'7UdUW]hUbWY	C <sub>ies</sub>	V <sub>CE</sub> =25V	-	2500	-	pF	
			C <sub>oes</sub>	V <sub>GE</sub> =0V	-		110
C i h d i h'7UdUW]hUbWY	C <sub>res</sub>	f=1MHz	-	34	-	pF	
			-	34	-		
; UhY'7 \Uf [Y	Q <sub>G</sub>	V <sub>CC</sub> = 400V I <sub>C</sub> = 40A V <sub>GE</sub> = 15V	-	120	-	nC	
			-	120	-		
Hifb!Cb'8Y'Um'H]aY	t <sub>d(on)</sub>	T <sub>J</sub> = 25°C	-	32	-	ns	
			-	54	-		
F]gY'H]aY	t <sub>r</sub>	V <sub>CC</sub> = 600V	-	178	-	ns	
			-	178	-		
Hifb!CZ'8Y'Um'H]aY	t <sub>d(off)</sub>	I <sub>C</sub> = 40A	-	40	-	ns	
			-	40	-		
:U''H]aY	t <sub>r</sub>	V <sub>GE</sub> = 15V	-	56	-	ns	
			-	56	-		
Hifb!Cb'9bYf [m	E <sub>on</sub>	R <sub>G</sub> = 10	-	2.8	-	mJ	
			-	2.8	-		
Hifb!CZ'9bYf [m	E <sub>off</sub>	L = 500μH Energy loss include "tail" and FWD (FDRW20S120J) reverse recovery.	-	1.6	-	mJ	
			-	1.6	-		
Hifb!Cb'8Y'Um'H]aY	t <sub>d(on)</sub>	T <sub>J</sub> = 150°C	-	32	-	ns	
			-	48	-		
F]gY'H]aY	t <sub>r</sub>	V <sub>CC</sub> = 600V	-	220	-	ns	
			-	220	-		
Hifb!CZ'8Y'Um'H]aY	t <sub>d(off)</sub>	I <sub>C</sub> = 40A	-	56	-	ns	
			-	56	-		
:U''H]aY	t <sub>r</sub>	V <sub>GE</sub> = 15V	-	4.6	-	ns	
			-	4.6	-		
Hifb!Cb'9bYf [m	E <sub>on</sub>	R <sub>G</sub> = 10	-	4.6	-	mJ	
			-	4.6	-		
Hifb!CZ'9bYf [m	E <sub>off</sub>	L = 500μH Energy loss include "tail" and FWD (FDRW20S120J) reverse recovery.	-	2.4	-	mJ	
			-	2.4	-		
: cfkUfX'Jc'hU[Y'8fcd	V <sub>F</sub>	I <sub>F</sub> =20A	T <sub>J</sub> =25°C	-	2.2	2.8	V
			T <sub>J</sub> =175°C	-	1.8	-	V
8]cXY'FYjYfgY'FYWc jYfm'H]aY	t <sub>rr1</sub>	V <sub>CC</sub> =30V I <sub>F</sub> = 3.0A -di/dt=200A/μs	-	42	-	ns	
			-	42	-		
8]cXY'FYjYfgY'FYWc jYfm'H]aY	t <sub>rr2</sub>	V <sub>CC</sub> =600V I <sub>F</sub> =20A	-	0.38	-	μs	
			-	0.38	-		
8]cXY'FYjYfgY'FYWc jYfm'7 \Uf [Y	Q <sub>rr</sub>	-di <sub>r</sub> /dt=200A/μs T <sub>J</sub> =25°C	-	0.95	-	μC	
			-	0.95	-		



8YgWf]dh]cb	GmaVc`g	7cbX]h]cbg	7\UfUWhYf]gh]Wg			Ib]h
			a]b"	hmd"	aUI"	
8]cXY'FYjYfgY'FYWc jYfm'H]a Y	$t_{rr2}$	$V_{cc}=600V$ $I_F=20A$	-	0.66	-	$\mu s$
8]cXY'FYjYfgY'FYWc jYfm'7\Uf[Y	$Q_{rr}$	$-di_F/dt=200A/\mu s$ $T_j=175^\circ C$	-	4.5	-	$\mu C$

●H\YfaU`fYg]ghUbWY

hYag	GmaVc`g	7\UfUWhYf]gh]Wg			Ib]h
		a]b"	hmd"	aUI"	
H\YfaU`FYg]ghUbWYi>i bWh]cb!5aV]Ybh	$R_{th(j-a)}$	-	-	50	$^\circ C/W$
H\YfaU`FYg]ghUbWYi'; 6H>i bWh]cb'hc'7UgY	$R_{th(j-c)}_{IGBT}$	-	-	0.347	
H\YfaU`FYg]ghUbWYi': K8>i bWh]cb'hc'7UgY	$R_{th(j-c)}_{FWD}$	-	-	1.191	

■ 7 \UfUWhYf]gh]Wg'flFYdfYgYbhUh]jYl

Graph.1  
DC Collector Current vs T<sub>c</sub>  
V<sub>GE</sub> ≥ +15V, T<sub>i</sub> ≤ 175°C

Graph.2  
Collector

Collector current I<sub>c</sub> [A]

Switching frequency f<sub>s</sub> [kHz]

Case Temperature [°C]

Collector- Emitter current : I<sub>CE</sub> [A]

I<sub>c</sub> [A]

I<sub>c</sub> [A]

V<sub>CE</sub> [V]

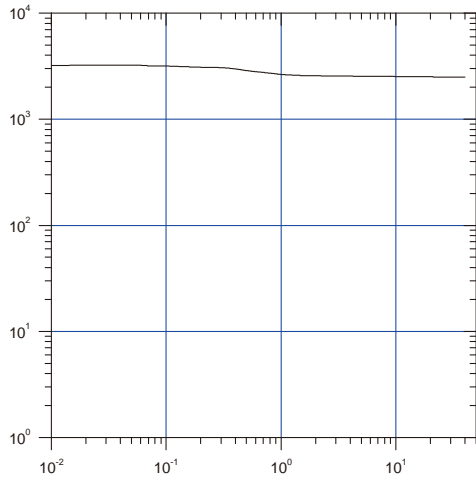
V<sub>CE</sub> [V]

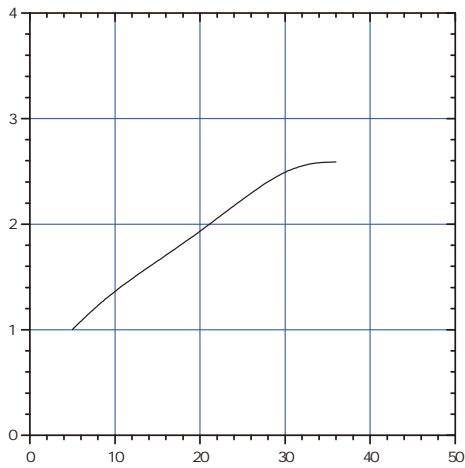
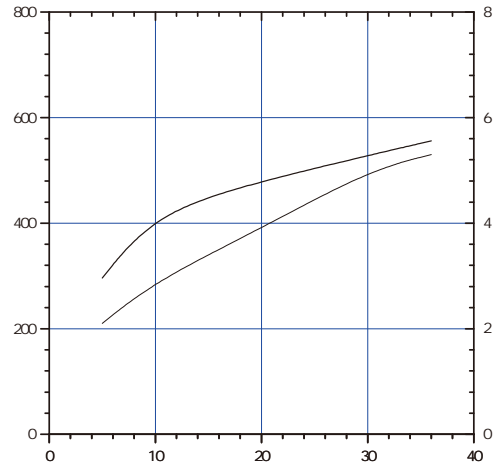
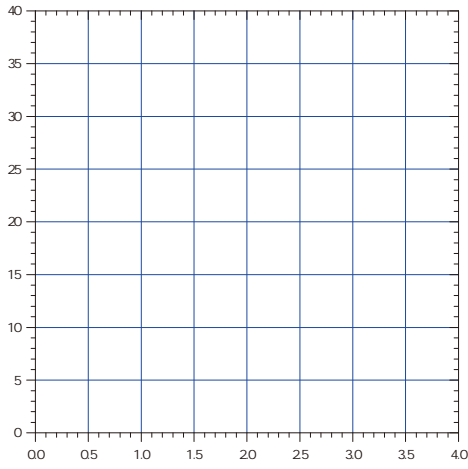
I<sub>c</sub> [A]

Gate Threshold Voltage V<sub>GE(th)</sub> [V]

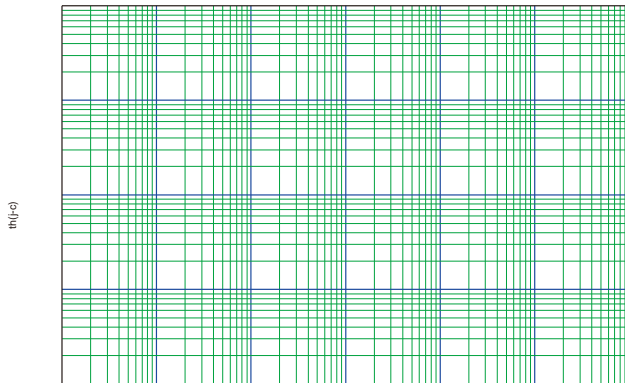
V<sub>GE</sub> [V]

T<sub>i</sub> [ °C ]

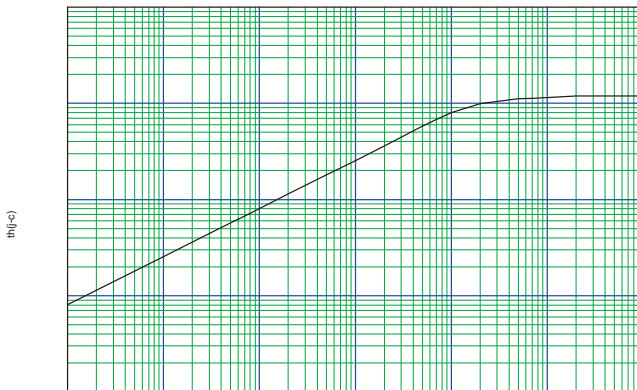




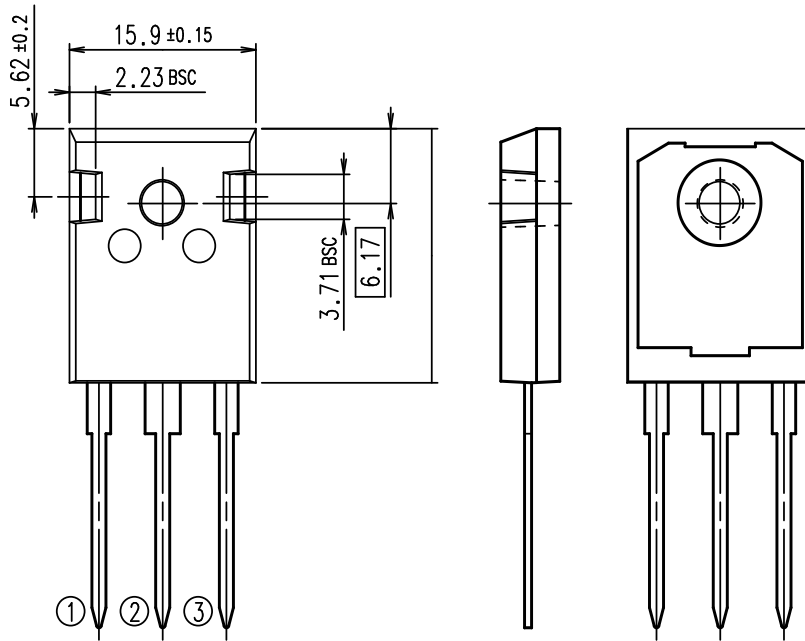
Graph.17  
Transient thermal resistance of IGBT



Graph.18  
Transient thermal resistance of FWD



■ C i h`]bY' 8fUk]b[ g`i a a



**K5FB-B ;**

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