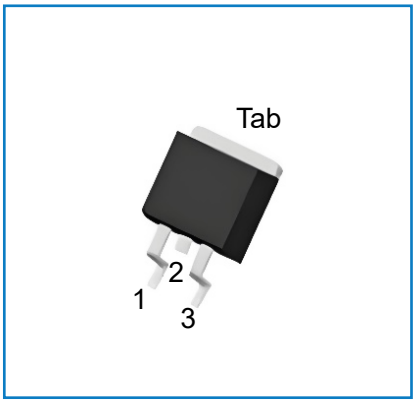
WGS75M65FT3

IGBT with Trench and Field-Stop Technology

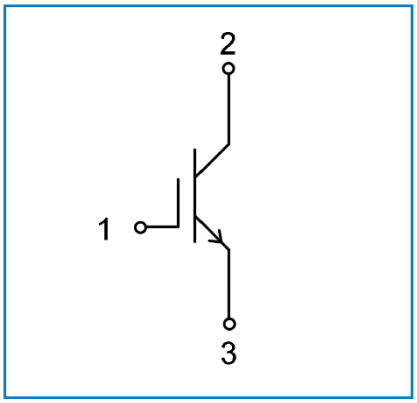
Features

- V_{CES}=650V
- I_C=75A@T_C=100℃
- Very low V_{CEsat}
- High speed switching
- High ruggedness
- RoHS compliant
- Halogen free



Applications

- PFC
- Discharge switch



Package pin definition	1	2/Tab	3
	Gate	Collector	Emitter

Part	Package	Marking	Packing method	MPQ
WGS75M65FT3	TO-263	WGS75M65FT3	Tape and reel	800/Reel

1 Maximum Ratings

Table 1 Maximum rated Values(T_C=25℃ unless otherwise specified)

Parameter	Symbol	Condition	Values	Unit
Collector to Emitter Voltage	V_{CES}		650	V
Gate to Emitter Voltage	V_{GES}		±20	V
Continuous Collector Current [1]	I_C	T_C=25℃	150	A
		T_C=100℃	75	A
Pulsed Collector Current [2]	I_{CM}		300	A
Maximum Power Dissipation	P_D	T_C=25℃	333	W
		T_C=100℃	167	W
Operating Junction Temperature Range	T_J		-55~+175	℃
Storage Temperature Range	T_{STG}		-55~+150	℃
Thermal Resistance, Junction to case for IGBT	$R_{th(J-C)}$		0.45	K/W

Notes:

1. The collector DC current is limited by the maximum junction temperature.
2. Pulse width limited by maximum junction temperature.

2 Electrical Characteristics, IGBT

Table 2 Characteristics Values(T_C=25℃ unless otherwise specified)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Collector to Emitter Breakdown Voltage	BV_{CES}	I_C=250μA, V_{GE}=0V	650	-	-	V
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=75A, V_{GE}=15V	-	1.9	2.4	V
		I_C=75A, V_{GE}=15V, T_J=150℃	-	2.3	-	V
Gate Threshold Voltage	$V_{GE(th)}$	I_C=1mA, V_{GE}= V_{CE}	4.2	5.2	6.2	V
Zero Gate Voltage Collector current	I_{CES}	V_{CE}=650V, V_{GE}=0V	-	-	50	μA
Gate to Emitter Leakage Current	I_{GES}	V_{GE}=±20V, V_{CE}=0V	-	-	±100	nA
Internal Gate Resistor	R_{Gint}	f=1MHz, V_{AC}=25mV	-	3.4	-	Ω
Input Capacitance	C_{ies}	f=1MHz, V_{CE}=30V, V_{GE}=0V	-	3900	-	pF
Output Capacitance	C_{oes}		-	274	-	pF
Reverse Transfer Capacitance	C_{res}		-	27	-	pF
Total Gate charge	Q_G	V_{CC}=520V, I_C=75A, V_{GE}=15V	-	180	-	nc
Gate to Emiter charge	Q_{GE}		-	64	-	nc
Gate to Collector charge	Q_{GC}		-	40	-	nc
Turn-on Delay Time	$t_{d(on)}$	V_{CC}=400V, I_C=75A, V_{GE}=0/15V, R_G=10Ω, T_J=25℃ Inductive load	-	64	-	ns
Rising Time	t_r		-	76	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	86	-	ns
Falling Time	t_f		-	47	-	ns
Turn-on Switching Loss Energy [1]	E_{on}		-	2.5	-	mJ
Turn-off Switching Loss Energy	E_{off}		-	1.1	-	mJ
Turn-on Delay Time	$t_{d(on)}$	V_{CC}=400V, I_C=75A, V_{GE}=0/15V, R_G=10Ω, T_J=150℃ Inductive load	-	70	-	ns
Rising Time	t_r		-	82	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	108	-	ns
Falling Time	t_f		-	75	-	ns
Turn-on Switching Loss Energy [1]	E_{on}		-	4.6	-	mJ
Turn-off Switching Loss Energy	E_{off}		-	1.6	-	mJ

Notes：

1. This value is tested with the FRD of WGD75J65FTFB3

3 Typical Characteristics diagrams

Fig.1 Typical output characteristic
$I_C=f(V_{CE})$, $T_{vj}=25℃$

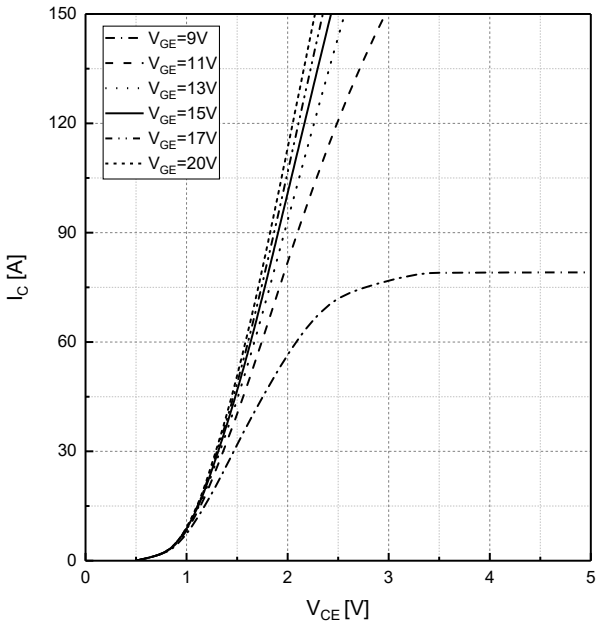


Fig.2 Typical output characteristic
$I_C=f(V_{CE})$, $T_{vj}=150℃$

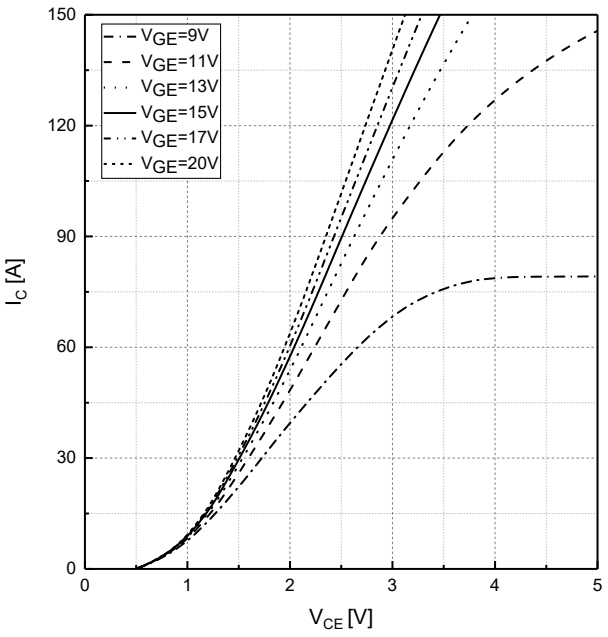


Fig.3 Typical transfer characteristic
$I_C=f(V_{GE})$, $V_{CE}=20V$

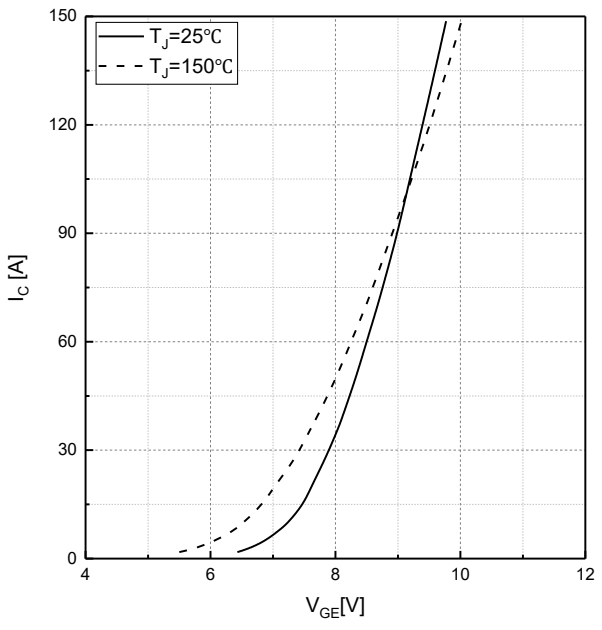


Fig.4 Typical $V_{GE(th)}$ as a function of T_{vj}
$V_{GEth}=f(T_{vj})$, $I_C=1mA$

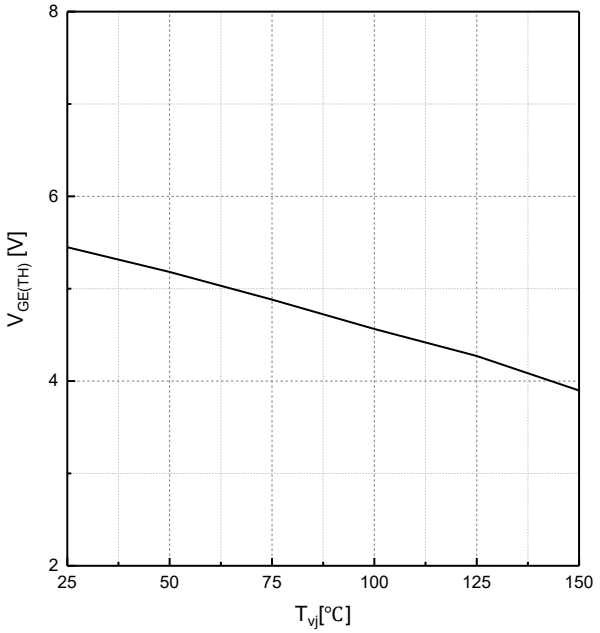


Fig.5 Typical V_{CEsat} as a function of T_{vj}
$V_{CEsat}=f(T_{vj})$, $V_{GE}=15V$

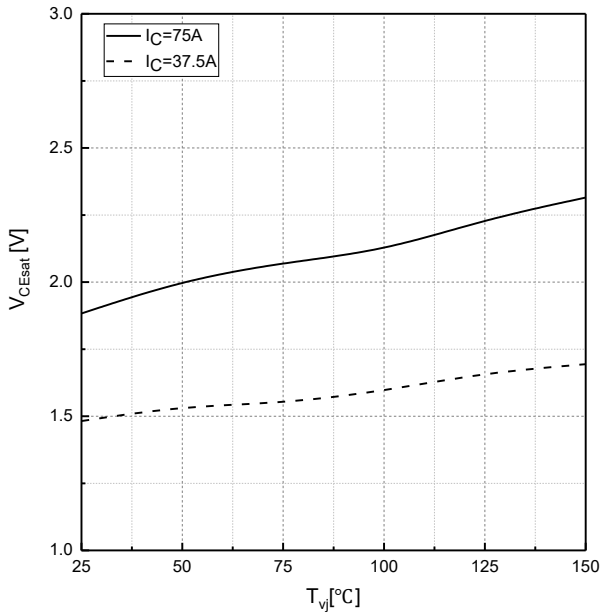


Fig.6 Typical switching loss energy as a function of R_G
$E=f(R_G)$, V_{CC}=400V, I_C=75A, V_{GE}=0/15V, T_J=150℃

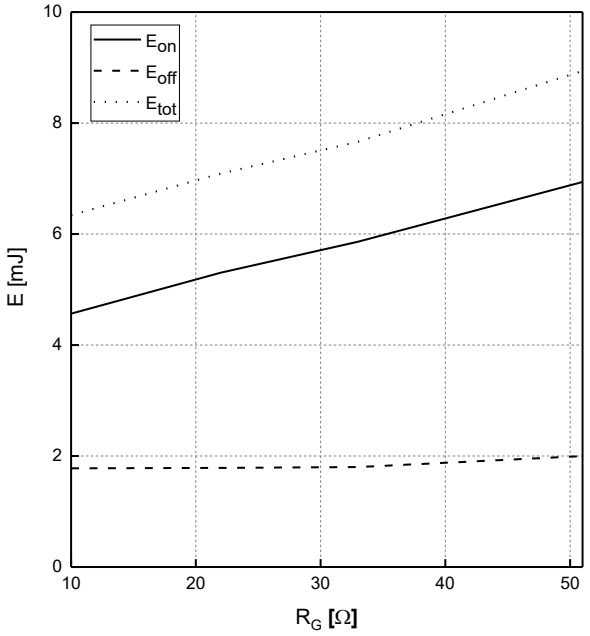


Fig.7 Typical switching loss energy as a function of I_C
$E=f(I_C)$, V_{CC}=400V, R_G=10Ω, V_{GE}=0/15V, T_J=150℃

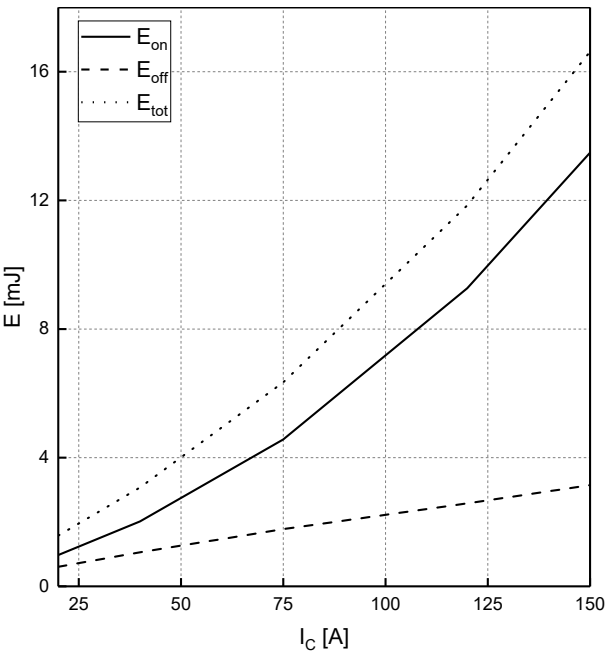


Fig.8 Typical Gate charge
$V_{GE}=f(Q_G)$, I_C=75A

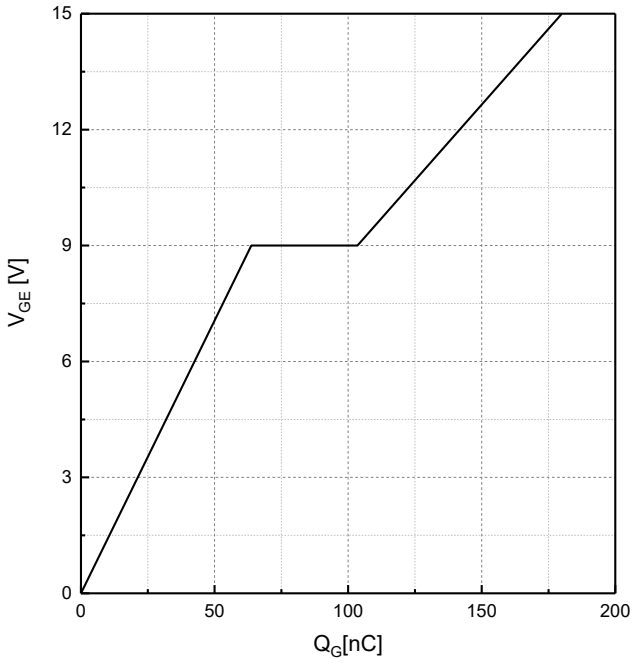


Fig.9 Typical capacitance as a function of V_{CE}
$C=f(V_{CE})$, f=1MHz, V_{GE}=0V

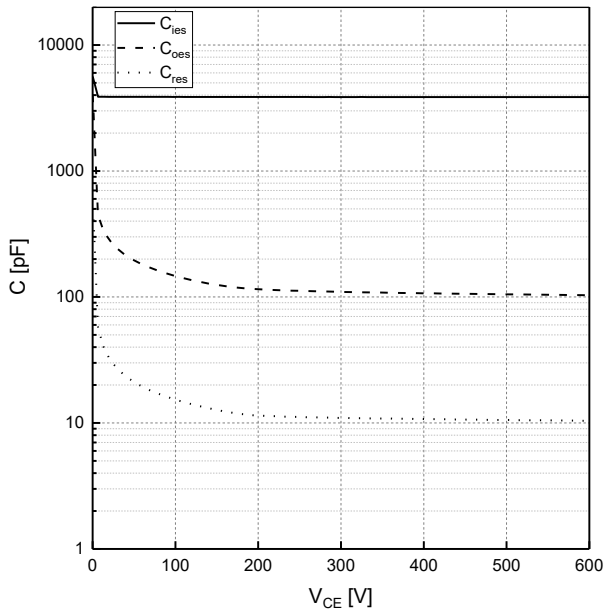


Fig.10 Power dissipation as a function of T_C
$P_{tot}=f(T_C)$, $T_{vj}\leq 175℃$

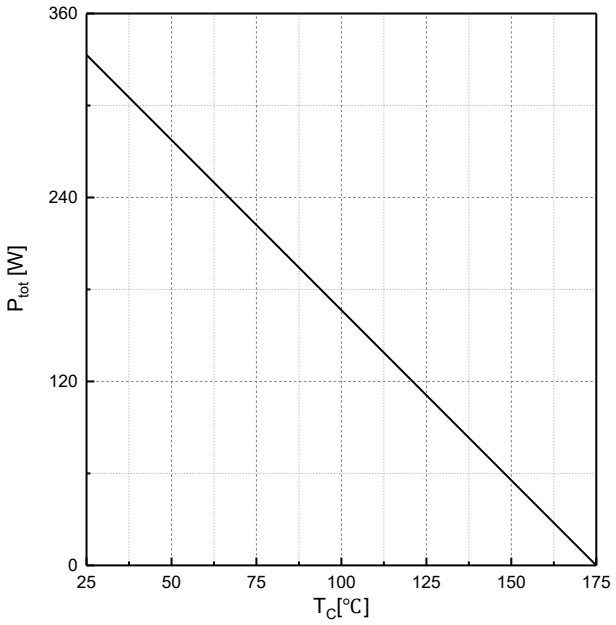
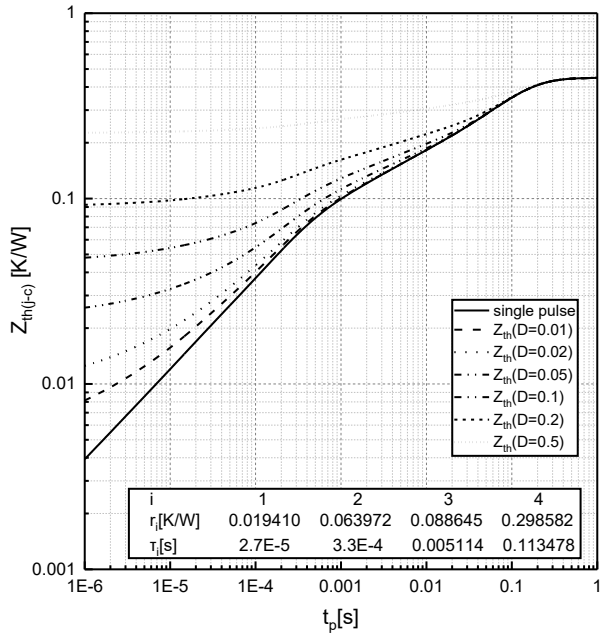
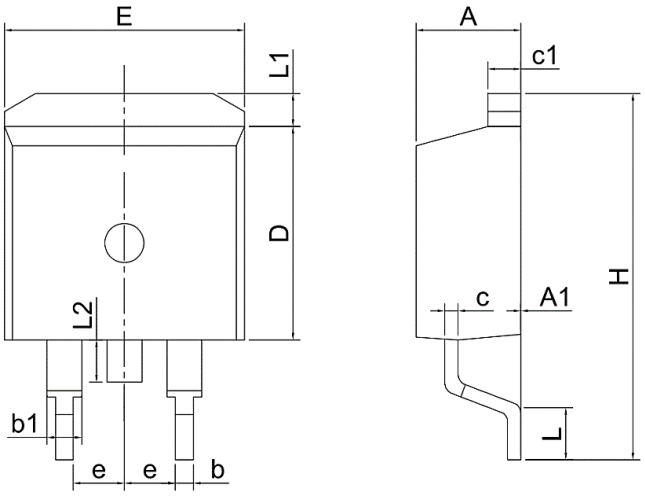


Fig.11 Transient thermal impedance of IGBT
$Z_{th(j-c)}=f(t_p)$, $D=t_p/T$



4 Package Outlines



SYMBOL	mm		
	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	0.00	0.13	0.25
b	0.70	0.80	0.90
b1	1.21	1.27	1.40
c	0.30	-	0.60
c1	1.20	1.30	1.40
D	9.10	9.20	9.30
E	9.70	9.90	10.20
e	2.54BSC		
H	14.80	15.10	15.40
L	2.10	2.30	2.50
L1	1.00	1.20	1.40
L2	1.10	1.30	1.50

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Product Specification Statement

1. The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

2. The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. WAYON shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and WAYON assumes no responsibility for the application of the product.

3. WAYON strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, WAYON cannot guarantee that the information provided in the product specification is entirely accurate and error-free. WAYON shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications. WAYON reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with WAYON to ensure that the product specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult WAYON in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.

4. Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

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