

650V 6A T c a d F d S IGBT

JJT6N65ST

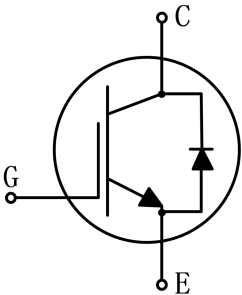
- $V_{CE}=650V$
- $I_C=6A@ V_{CE}=100$
- $V_{CE(sat)}=1.7 V$

TO-252

- High ruggedness performance
- Very tight parameter distribution
- Positive $V_{CE(sat)}$ temperature coefficient
- High efficiency for motor control
- Excellent current sharing in parallel operation
- RoHS compliant



- Home appliances
- Motor drives
- Fan, Pumps, Vacuum cleaner



Type	Marking	Package	Packaging method
JJT6N65ST	T0665ST	TO-252	Tape and reel





CES	Collector-emitter voltage	650	V
GES	Gate-emitter voltage	±20	V
C	Continuous collector current ($T_C=25^\circ\text{C}$)	12	A
	Continuous collector current ($T_C=100^\circ\text{C}$)	6	A
CM	Pulsed collector current, I_P limited by T_{vjmax}	24	A
F	Diode continuous forward current ($T_C=100^\circ\text{C}$)	6	A
FM	Diode maximum current, I_P limited by T_{vjmax}	24	A
sc	Short circuit withstand time	10	µs
P_{tot}	Power dissipation ($T_C=25^\circ\text{C}$)	60	W
	Power dissipation ($T_C=100^\circ\text{C}$)	30	W
T_{vj}	Operating junction temperature range	-40 to +175	
STG	Storage temperature range	-55 to +150	

$\theta_{th(j-c)}$	Thermal resistance, junction to case for IGBT	-	2.5	K/ W
$\theta_{th(j-c)}$	Thermal resistance, junction to case for Diode	-	4.6	K/ W
$\theta_{th(j-a)}$	Thermal resistance, junction to ambient	-	50	K/ W



($v_j=25$ unless otherwise specified)

Static characteristics

C_{ES}	Collector-emitter breakdown voltage	$V_{GE}=0V, I_C=250\mu A$	650	-	-	V
C_{ES}	Collector-emitter leakage current	$V_{CE}=650V, V_{GE}=0V$	-	-	10	μA
G_{ES}	Gate leakage current, forward	$V_{GE}=20V, V_{CE}=0V$	-	-	100	nA
	Gate leakage current, reverse	$V_{GE}=-20V, V_{CE}=0V$	-	-	-100	nA
$V_{GE(th)}$	Gate-emitter threshold voltage	$V_{GE}=V_{CE}, I_C=1mA$	5.7	6.2	6.7	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	$V_{GE}=15V, I_C=6A$	-	1.7	-	V
		$V_{GE}=15V, I_C=6A, v_j=175$	-	2.2	-	V

Dynamic characteristics

t_{ies}	Input capacitance	$V_{CE}=30V$ $V_{GE}=0V$ $f=1MHz$	-	480	-	pF
t_{oes}	Output capacitance		-	22	-	pF
t_{res}	Reverse transfer capacitance		-	8	-	pF
Q_g	Total gate charge	$V_{CC}=520V$ $V_{GE}=15V$ $I_C=6A$	-	19	-	nC





($v_j=25$ unless otherwise specified)

F	Diode forward voltage	$I_F=6A$	-	1.6	-	V
		$I_F=6A, v_j=175$	-	1.4	-	V
t_{rr}	Diode reverse recovery time	$V_R=400V$ $I_F=6A$ $dI_F/dt = -500A/\mu s$	-	55	-	ns
I_{rrm}	Diode peak reverse recovery current		-	10	-	A
Q_{rr}	Diode reverse recovery charge		-	306	-	nC
t_{rr}	Diode reverse recovery time	$V_R=400V$ $I_F=6A$ $dI_F/dt = -500A/\mu s$ $v_j=175$	-	98	-	ns
I_{rrm}	Diode peak reverse recovery current		-	12	-	A
Q_{rr}	Diode reverse recovery charge		-	529	-	nC



Fig 1. Typical output characteristic ($v_j=25$)

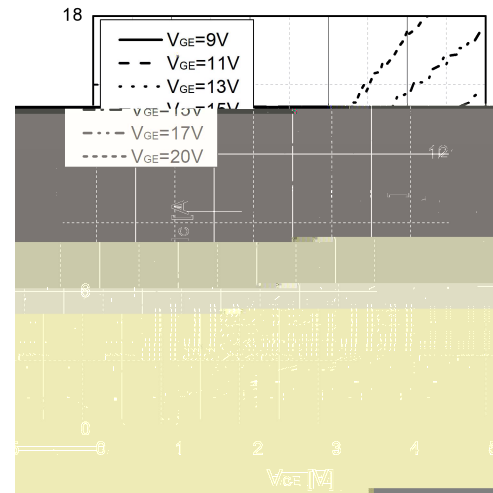


Fig 2. Typical output characteristic($v_j=175$)

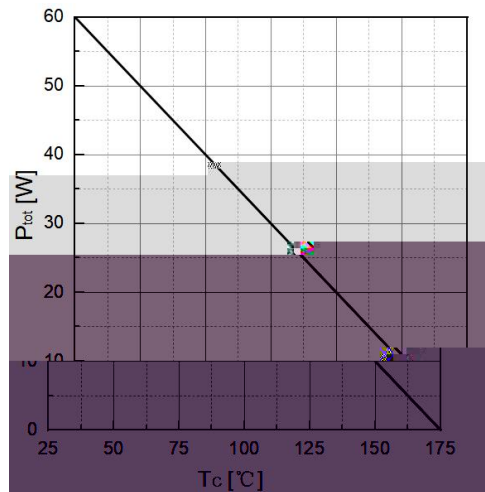


Fig 3. Power dissipation as a function of

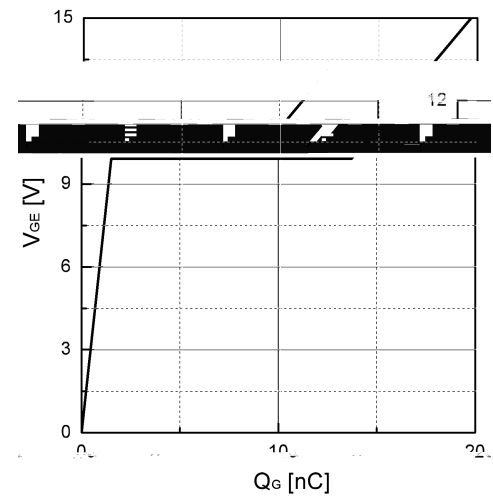


Fig 4. Typical Gate charge

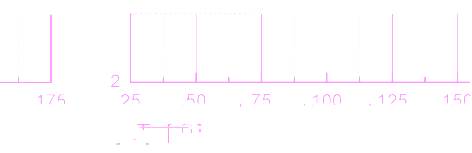
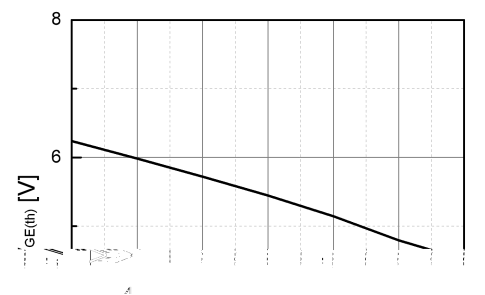


Fig 5. Typical $V_{GE(th)}$ as a function of v_j
($c=1mA$)



Fig 6. Typical F as a function of v_j

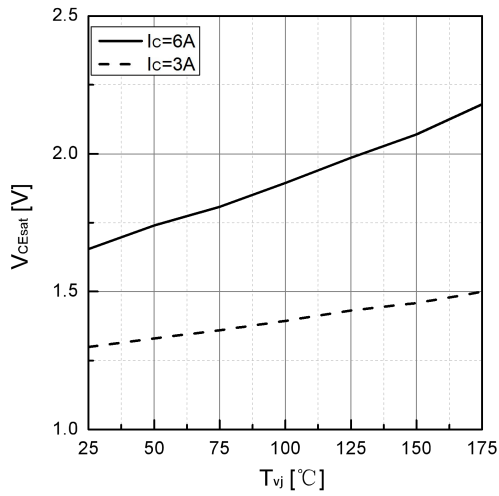


Fig 7. Typical V_{CEsat} as a function of T_{vj}

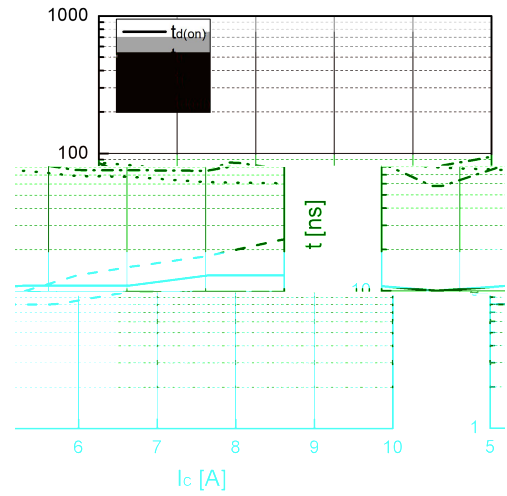


Fig 8. Typical switching time as a function of I_c

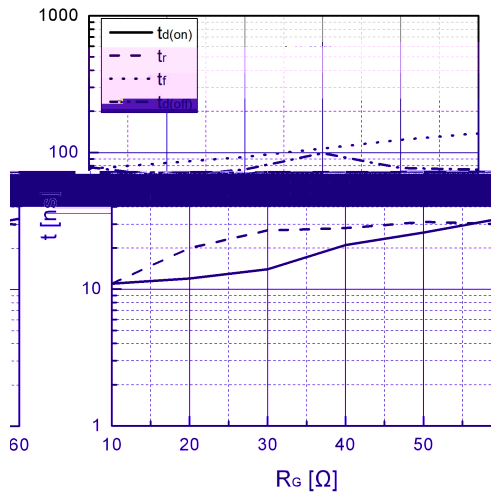


Fig 9. Typical switching times as a function of R_g

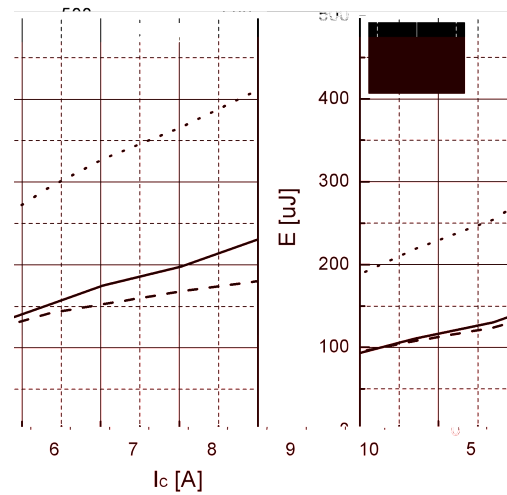


Fig 10. Typical switching energy losses as a function of I_c

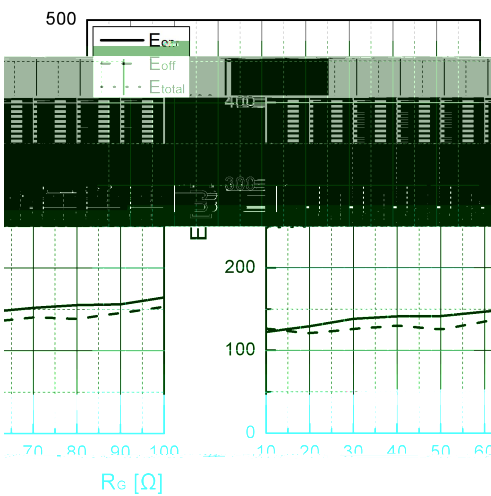


Fig 11. Typical switching energy losses as a function of R_g

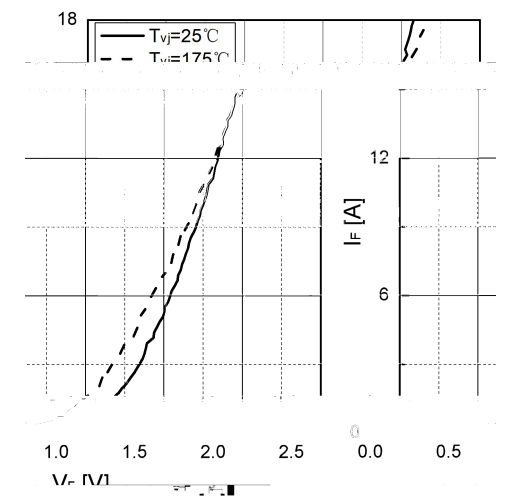


Fig 12. Typical I_F as a function of V_F

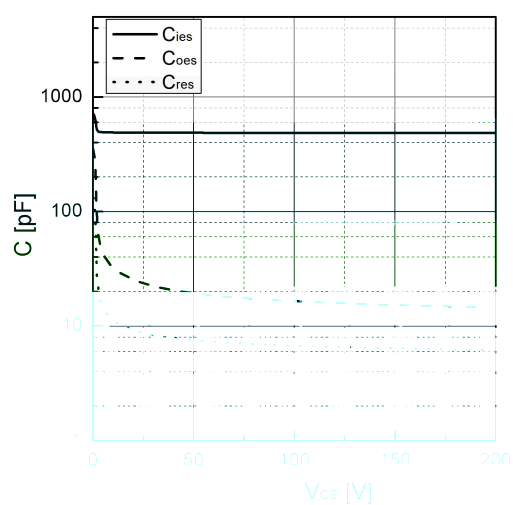


Fig 13. Typical capacitance as a function of V_{CE}
($f=1\text{MHz}$, $V_{GE}=0\text{V}$)

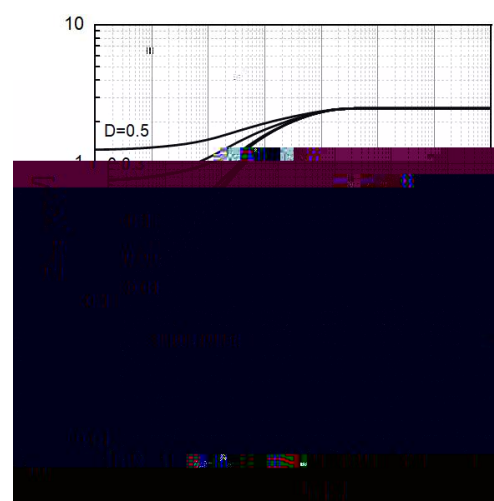
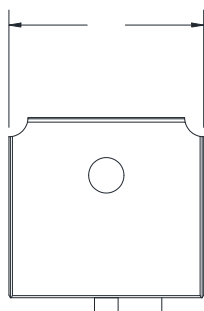


Fig 14. Transient thermal impedance of IGBT





Date	Revision	Changes
2024-04-17	Rev 1.1	Update
2025-01-13	Rev 1.2	Update
2025-04-08	Rev 1.3	Character Update
2025-12-23	Rev 1.4	Add marking specification
2026-06-23	Rev 1.5	Update Thermal

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