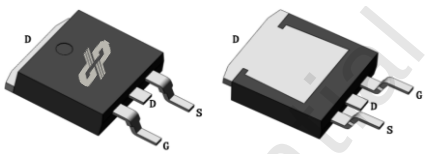
DP10N65DBDSI

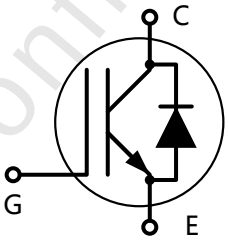
650V, 10A Power IGBT with Diode

Product Summary

Part #	V_{CE}	I_C	V_{CEsat}, T_{vj}=25℃
DP10N65DBDSI	650V	10A	1.5V

TO-252





Features

- Uses advanced FS IGBT technology
- Excellent conduction and switching loss
- Excellent stability and uniformity
- Fast and soft antiparallel diode

Applications

- Induction converters
- Uninterruptible power supplies
- Home Appliances

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP10N65DBDSI	10N65DBDSI	TO-252	Tape/Reel

Halogen-Free

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emmiter voltage	V_{CE}	650	V
Continuous collector current T_C = 25°C T_C = 100°C	I_C	 20 10	A
Pulsed collector current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	40	A
Turn off safe operating area $V_{CE} \le 650V$, $T_{vj} \le 175°C$	-	40	A
Diode forward current T_C = 25°C T_C = 100°C	I_F	 20 10	A
Diode pulsed current (T_C = 25°C, t_p limited by T_{jmax})	$I_{F\ pulse}$	40	A
Gate-emitter voltage	V_{GE}	±30	V
Power dissipation (T_C = 25°C)	P_{tot}	100	W
Operating junction temperature	T_j , T_{stg}	-40...+175	°C
Storage temperature	T_j , T_{stg}	-55...+150	°C

Thermal Resistance

Parameter	Symbol	Max	Unit
IGBT thermal resistance,junction case. Max	R_{thJC}	2	°C/W
Diode thermal resistance,junction case. Max	R_{thJC}	2.8	
Thermal resistance, junction – ambient. Max	R_{thJA}	65	

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Collector-emitter breakdown voltage	$V_{(BR)CES}$	650	-	-	V	V_{GE}=0V, I_C=250uA
Collector-emitter saturation voltage	V_{CEsat}	-	1.5	1.8	V	V_{GE} = 15V, I_C = 10A T_{vj}=25°C
			1.9			T_{vj}=150°C
		-	2	-		T_{vj}=175°C
Diode forward voltage	V_F	-	1.8	2.4	V	V_{GE} = 0V, I_F = 10A T_{vj}=25°C
			1.9			T_{vj}=150°C
		-	2	-		T_{vj}=175°C
Gate-emitter threshold voltage	$V_{GE(th)}$	4.2	4.8	5.5	V	V_{GE} =V_{CE}, I_C = 1mA
Zero gate voltage collector current	I_{CES}	-	-	1	μA	V_{CE}=650V,V_{GS}=0V T_{vj}=25°C
		-	100	-		T_{vj}=150°C
Gate-emitter leakage current	I_{GES}	-	-	100	nA	V_{CE} = 0V, V_{GE} =±30V
Transconductance	g_{fs}	-	14	-	S	V_{CE} = 20V, I_{CE} = 10A

Dynamic Characteristic

Input Capacitance	C_{ies}	-	720	-	pF	V_{CE} = 25V, V_{GE} = 0V, f = 100KHz
Output Capacitance	C_{oes}	-	31	-		
Reverse Transfer Capacitance	C_{res}	-	6	-		
Gate Total Charge	Q_g	-	24.5	-	nC	V_{CC} = 520V, I_C =10A, V_{GE} = 15V
Gate-Source charge	Q_{ge}	-	8.6	-		
Gate-Drain charge	Q_{gc}	-	7.7	-		
Turn-on delay time	$t_{d(on)}$	-	2	-	ns	T_{vj} = 25°C, V_{CC}=400V, I_C=10A, V_{GE}=15.0V, R_G=10.0Ω
Rise time	t_r	-	20	-		
Turn-off delay time	$t_{d(off)}$	-	42	-		
Fall time	t_f	-	112	-		
Turn-on energy	E_{on}	-	0.10	-	mJ	
Turn-off energy	E_{off}	-	0.18	-		
Turn-on delay time	$t_{d(on)}$	-	4	-	ns	T_{vj} = 175°C, V_{CC}=400V, I_C=10A, V_{GE}=15.0V, R_G=10.0Ω
Rise time	t_r	-	20	-		
Turn-off delay time	$t_{d(off)}$	-	40	-		
Fall time	t_f	-	116	-		
Turn-on energy	E_{on}	-	0.12	-	mJ	
Turn-off energy	E_{off}	-	0.25	-		

Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Diode peak reverse recovery curren	I_{rrm}	-	-2.1	-	A	T_{vj} = 25°C, V_R = 400V, IF = 10.0A, diF /dt = 200A/μs
Body Diode Reverse Recovery Time	t_{rr}	-	44	-	ns	
Body Diode Reverse Recovery Charge	Q_{rr}	-	50	-	nC	

Typical Performance Characteristics

Fig 1: Output Characteristics

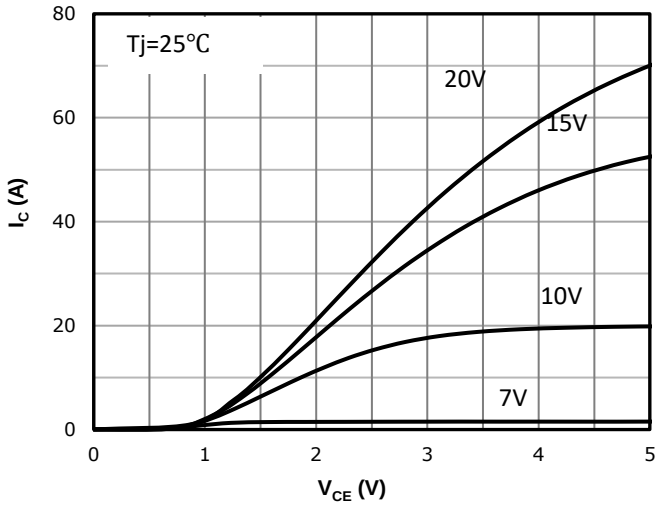


Fig 2: Output Characteristics

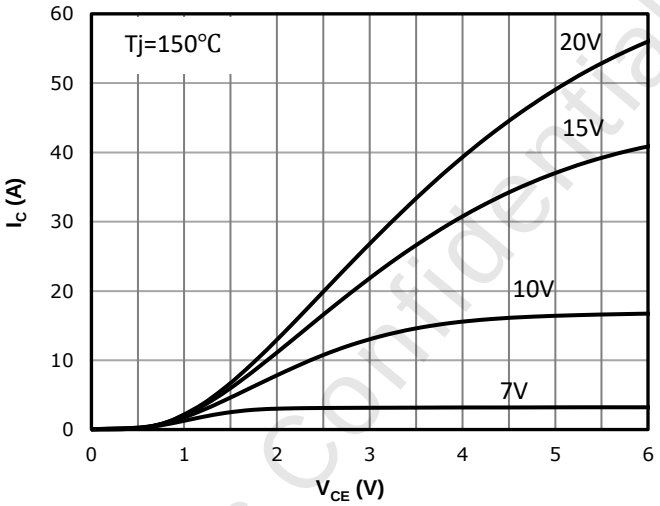


Fig 3: Transfer Characteristics

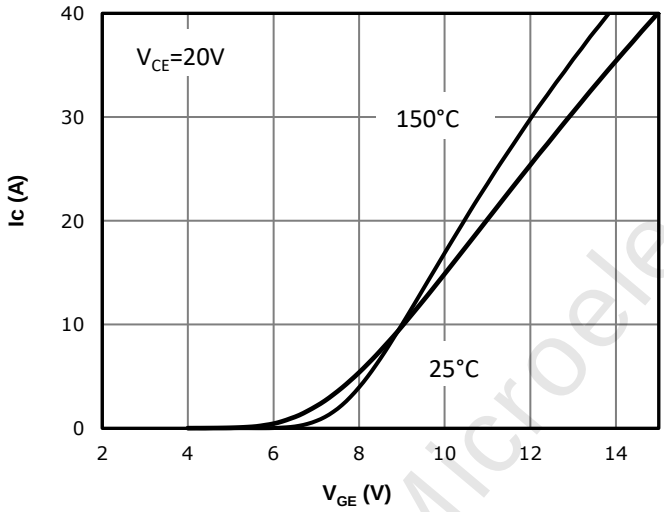


Fig 4: Typical collector-emitter voltage

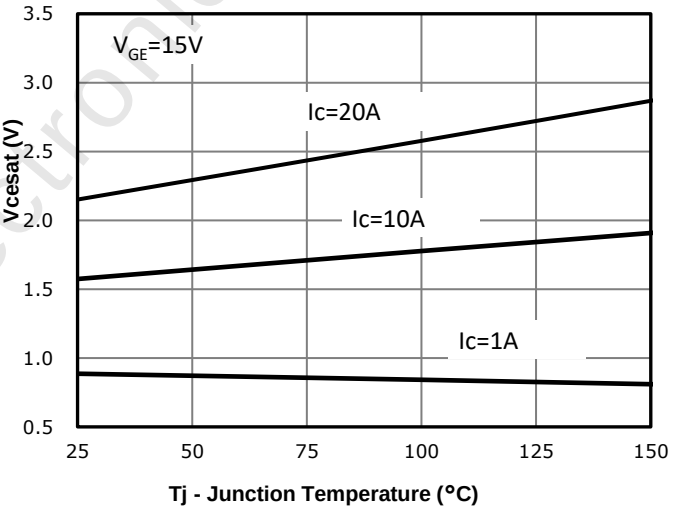


Fig 5: Gate Charge Characteristics

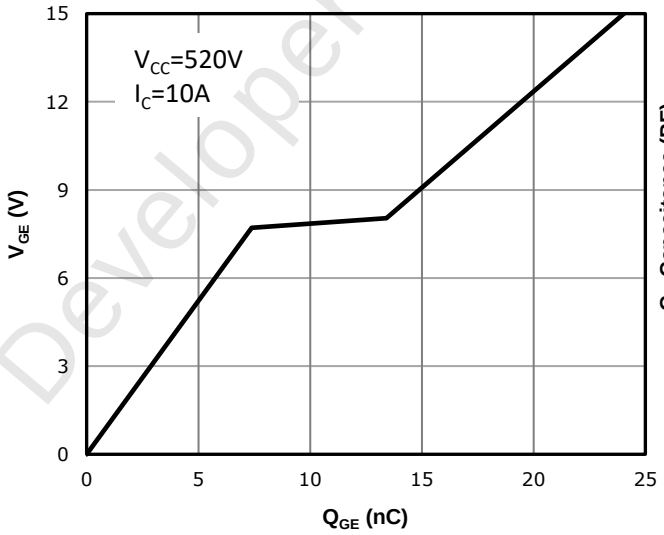


Fig 6: Capacitance Characteristics

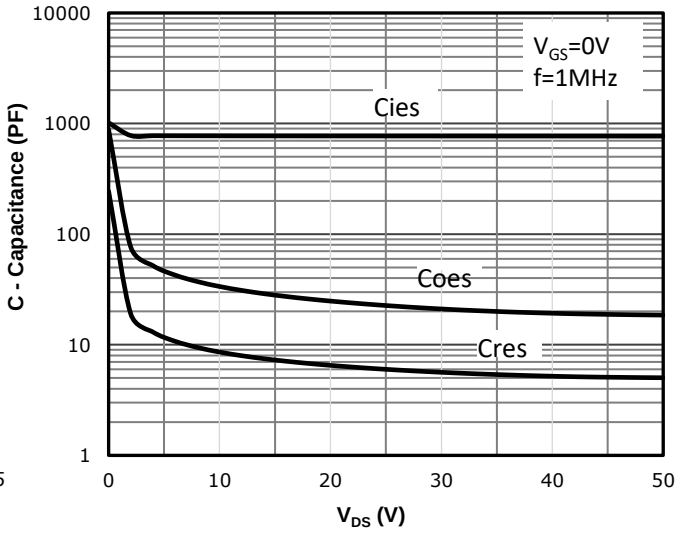


Fig 7: Typical switching energy losses

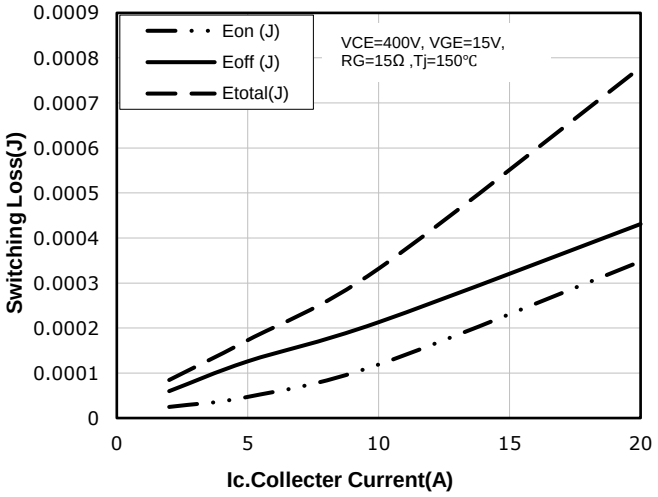


Fig 8: Typical switching times as a function of gate resistor

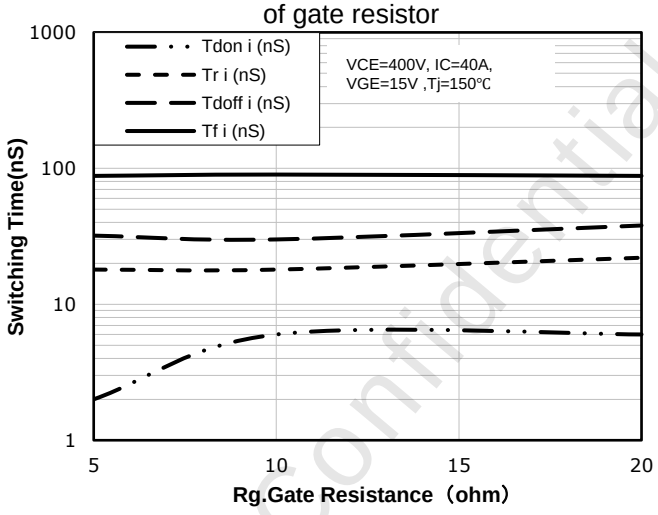


Fig 9: Typical switching energy losses as a function of gate resistor

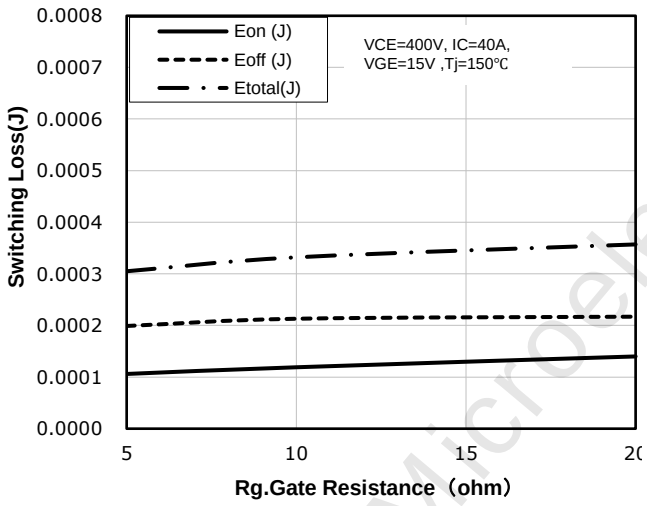


Fig 10: Typical switching energy losses as a function of collector emitter voltage

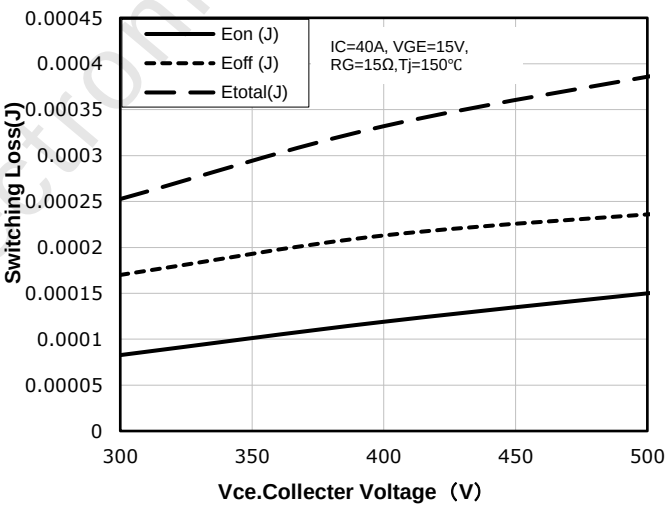


Fig 11: Typical switching times as a function of junction temperature

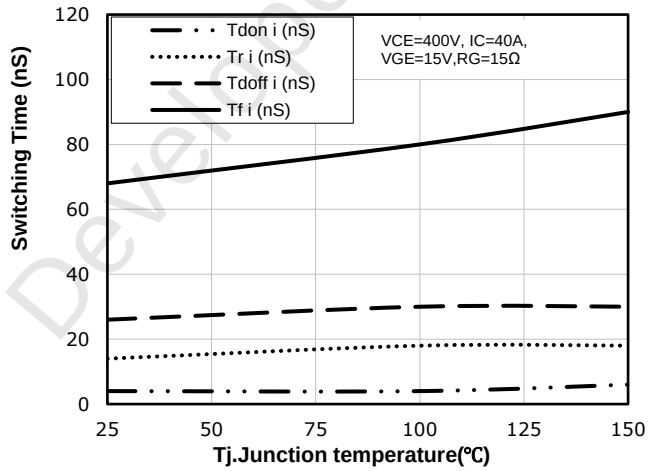


Fig 12: Typical switching energy losses as a function of junction temperature

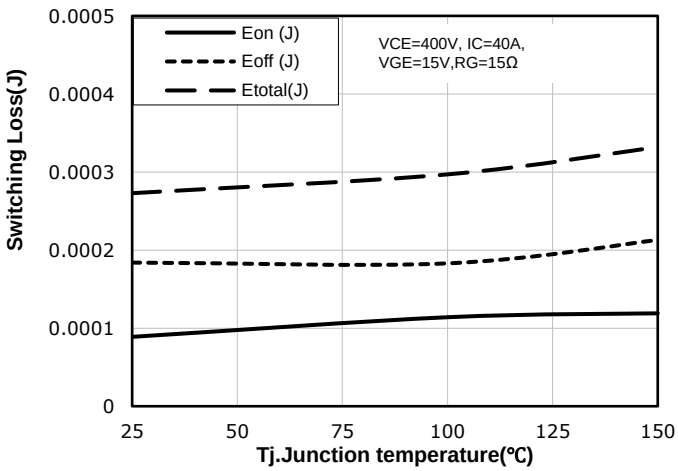
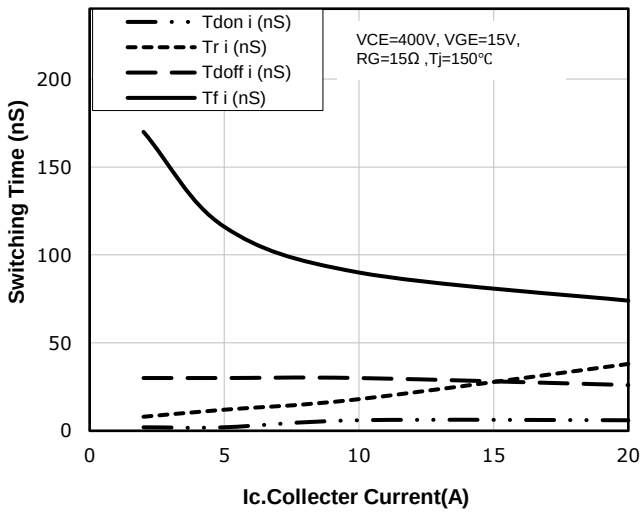
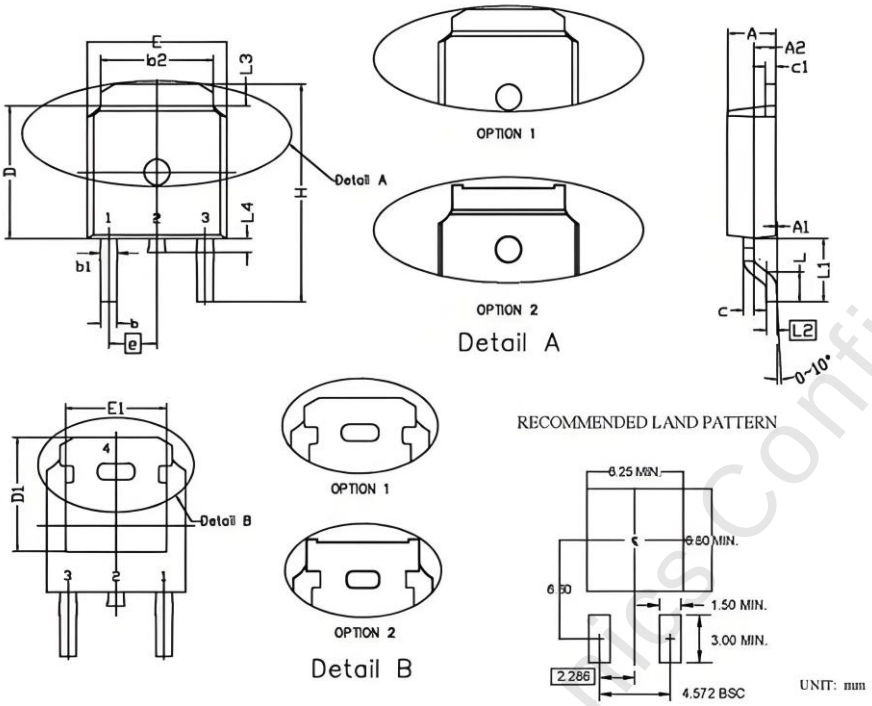


Fig 13: Typical switching times



Package Outline: TO252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.45	0.085	0.096
A1	0.00	0.15	0.000	0.006
A2	0.76	1.36	0.030	0.054
b	0.60	0.91	0.024	0.036
b1	0.65	1.15	0.026	0.045
b2	5.00	5.64	0.197	0.222
c	0.45	0.61	0.018	0.024
c1	0.36	0.66	0.014	0.026
D	5.80	6.30	0.228	0.248
D1	5.00	6.00	0.197	0.236
e	2.29 BSC.		0.090 BSC.	
E	6.30	6.90	0.248	0.272
E1	4.55	5.30	0.179	0.209
H	9.40	10.48	0.370	0.413
L	1.18	1.70	0.046	0.067
L1	2.92 REF		0.115 REF	
L2	0.36	0.66	0.014	0.026
L3	0.72	1.35	0.028	0.053
L4	0.60	1.20	0.024	0.047

Revision History

Revison	Major changes
0.5	Release for initial version

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