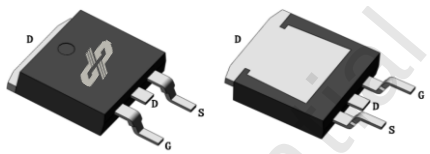
DP10N65KBDSI

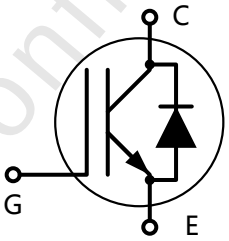
650V, 10A Power IGBT with Diode

Product Summary

Part #	V_{CE}	I_C	V_{CEsat}, T_{vj}=25℃
DP10N65KBDSI	650V	10A	1.5V

TO-263





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
DP10N65KBDSI	10N65DBDSI	TO-263	Tube

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} ≤ 650V, T_{vj} ≤ 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}	150	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}	1	°C/W
Diode thermal resistance,junction case. Max	R_{thJC}	3.3	
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

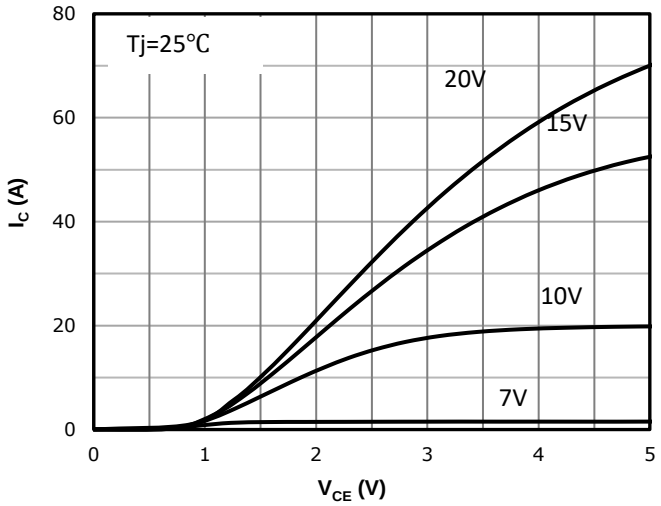


Fig 2: Output Characteristics

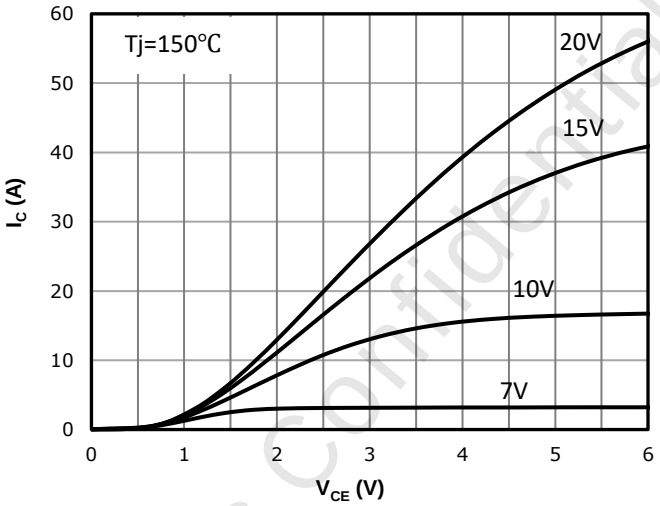


Fig 3: Transfer Characteristics

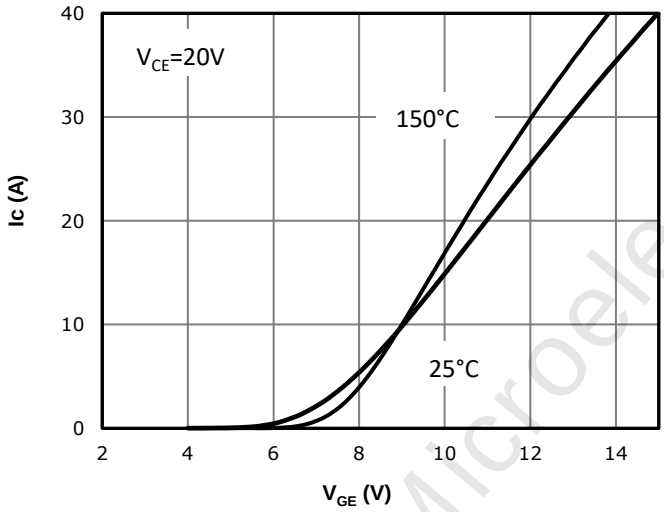


Fig 4: Typical collector-emitter voltage

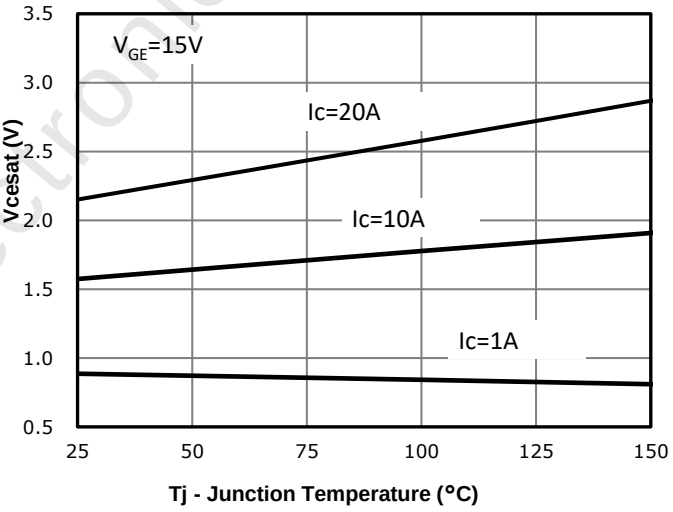


Fig 5: Gate Charge Characteristics

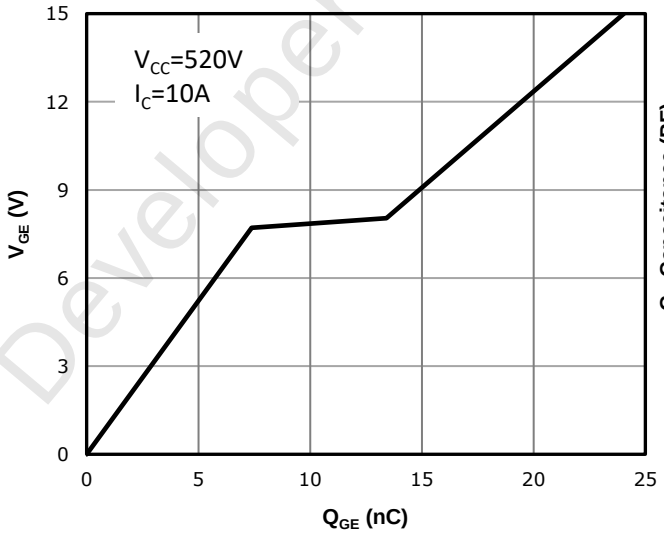


Fig 6: Capacitance Characteristics

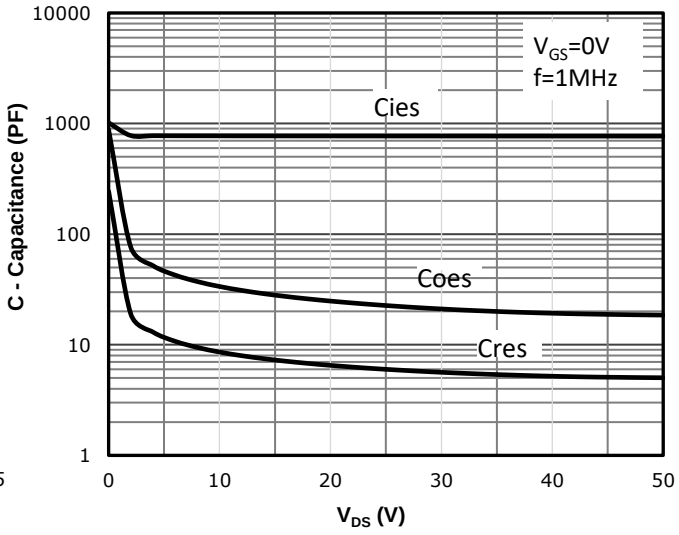


Fig 7: Typical switching energy losses

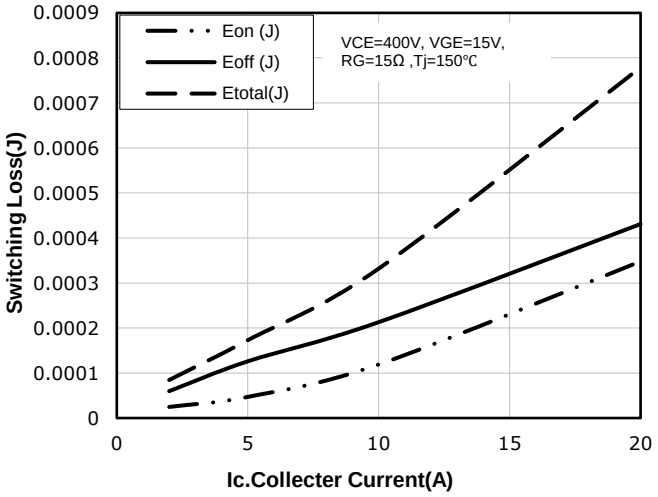


Fig 8: Typical switching times as a function of gate resistor

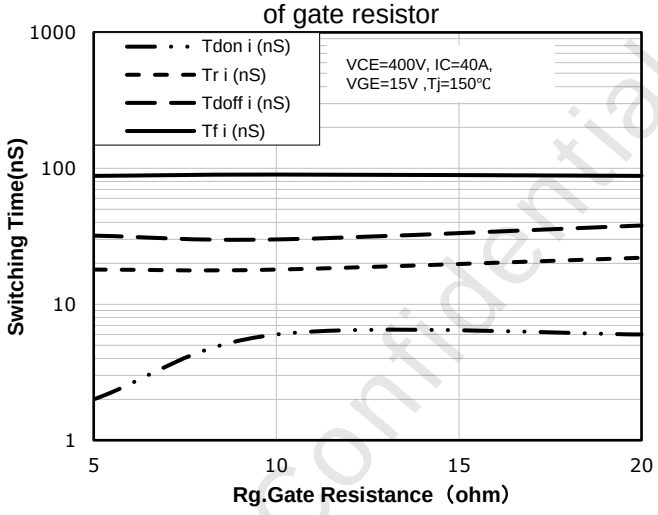


Fig 9: Typical switching energy losses as a function of gate resistor

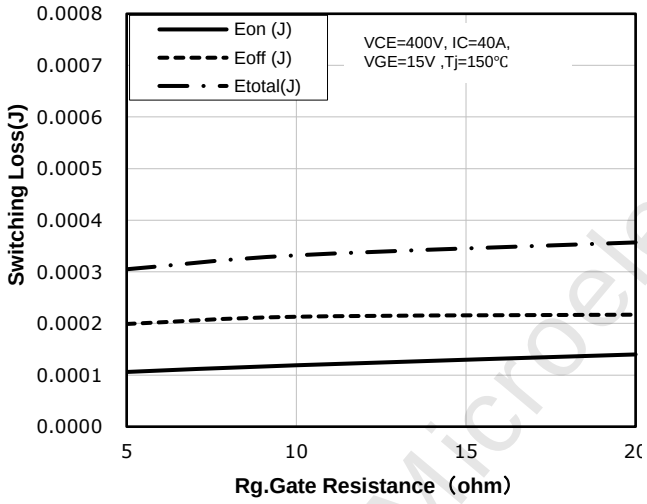


Fig 10: Typical switching energy losses as a function of collector emitter voltage

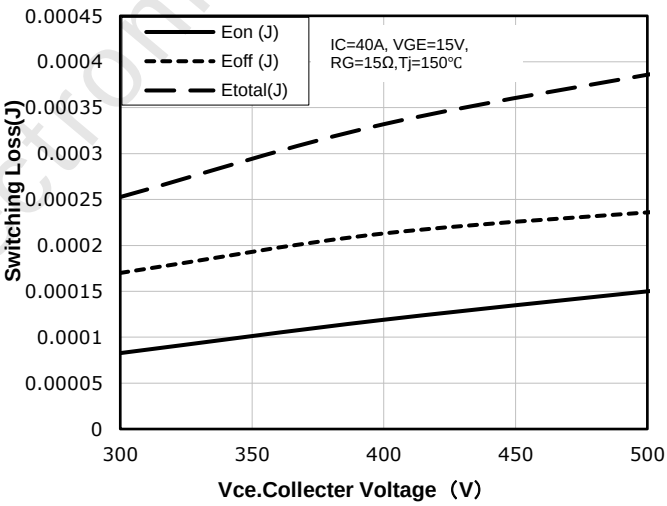


Fig 11: Typical switching times as a function of junction temperature

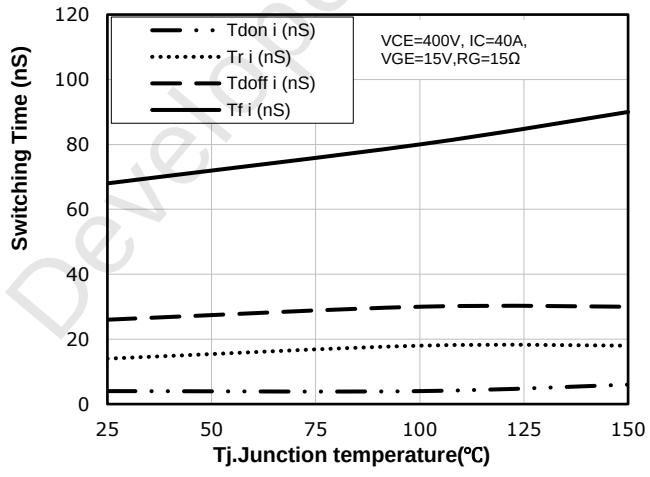


Fig 12: Typical switching energy losses as a function of junction temperature

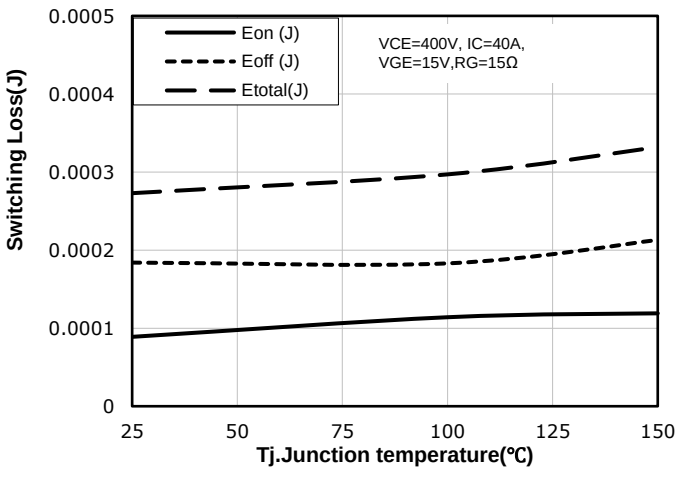
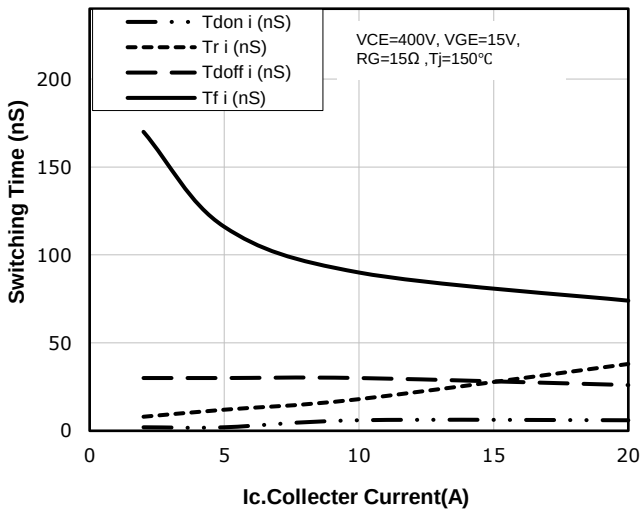
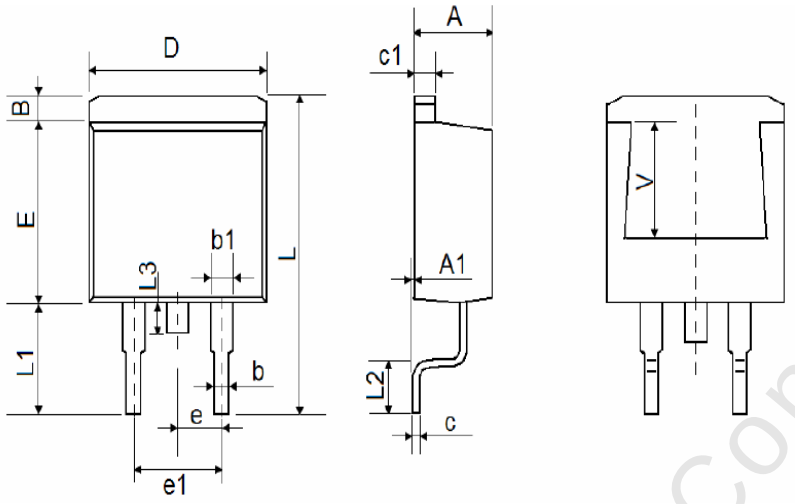


Fig 13: Typical switching times

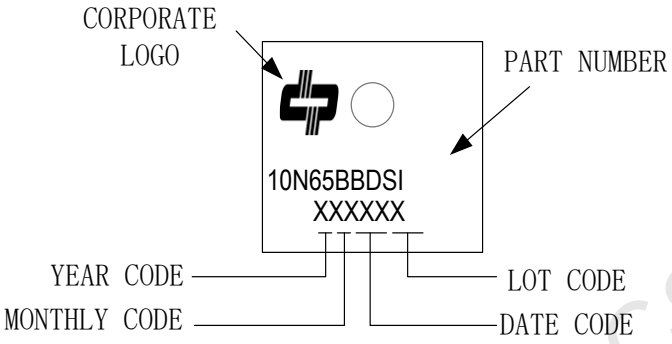


Package Outline: TO263



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.80	0.173	0.189
A1	0.00	0.15	0.000	0.006
B	1.17	1.37	0.046	0.054
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
c	0.31	0.53	0.012	0.021
c1	1.17	1.37	0.046	0.054
D	10.01	10.31	0.394	0.406
E	8.50	8.90	0.335	0.350
e	2.54 BSC.		0.100 BSC.	
e1	4.98	5.18	0.196	0.204
L	15.05	15.45	0.593	0.608
L1	5.08	5.48	0.200	0.216
L2	2.34	2.74	0.092	0.108
L3	1.30	1.70	0.051	0.067
V	5.600 Ref.		0.220 Ref.	

Part Marking Information



Revision History

Revison	Major changes
1.0	Release for initial version

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