General Description

OST80N65K2F-D uses advanced Oriental-Semi’s patented Trident-Gate Bipolar Transistor (TGBT^{TM}) technology to provide extremely low V_{CE}(sat), low gate charge, and excellent switching performance. This device is suitable for mid to high range switching frequency converters.

Features

- Advanced TGBT^{TM} technology
- Excellent conduction and switching loss
- Excellent stability and uniformity

Applications

- Induction converters
- Uninterruptible power supplies

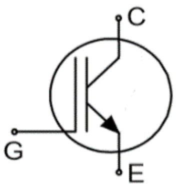
Key Performance Parameters

Parameter	Value	Unit
$V_{CES,\ min}$ @ 25°C	650	V
Maximum junction temperature	175	°C
$I_{C,\ pulse}$	320	A
$V_{CE(sat),\ typ}$ @ V_{GE}=15V	2.0	V
Q_g	92	nC

Marking Information

Product Name	Package	Marking
OST80N65K2F-D	TO263	OST80N65K2

Package & Pin Information



Absolute Maximum Ratings at T_{vj}=25°C unless otherwise noted

Parameter	Symbol	Value	Unit
Collector emitter voltage	V_{CES}	650	V
Gate emitter voltage	V_{GES}	±20	V
Transient gate emitter voltage, T_P≤10μs, D<0.01		±30	V
Continuous collector current¹⁾, T_C=25℃	I_C	96	A
Continuous collector current¹⁾, T_C=100℃		80	A
Pulsed collector current²⁾, T_C=25℃	$I_{C,\ pulse}$	320	A
Power dissipation³⁾, T_C=25℃	P_D	300	W
Power dissipation³⁾, T_C=100℃		150	W
Operation and storage temperature	T_{stg}, T_{vj}	-55 to 175	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
IGBT thermal resistance, junction-case	$R_{\theta JC}$	0.5	°C/W
Thermal resistance, junction-ambient⁴⁾	$R_{\theta JA}$	40	°C/W

Electrical Characteristics at T_{vj}=25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Collector-emitter breakdown voltage	$V_{(BR)CES}$	650			V	V_{GE}=0 V, I_C=0.5 mA
Collector-emitter saturation voltage	$V_{CE(sat)}$		2.0	2.4	V	V_{GE}=15 V, I_C=80 A T_{vj}=25°C
			2.54		V	V_{GE}=15 V, I_C=80 A, T_{vj} =125°C
			2.88		V	V_{GE}=15 V, I_C=80 A, T_{vj} =175°C
Gate-emitter threshold voltage	$V_{GE(th)}$	3.0	4.0	5.0	V	V_{CE}=V_{GE}, I_D=0.5 mA
Gate-emitter leakage current	I_{GES}			100	nA	V_{CE}=0 V, V_{GE}=20 V
Zero gate voltage collector current	I_{CES}			10	μA	V_{CE}=650 V, V_{GE}=0 V

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{ies}		5494		pF	V_{GE}=0 V, V_{CE}=25 V, f=100 kHz
Output capacitance	C_{oes}		80		pF	
Reverse transfer capacitance	C_{res}		4		pF	
Turn-on delay time	$t_{d(on)}$		35		ns	V_{GE}=15 V, V_{CC}=400 V, R_G=10 Ω, I_C=80 A
Rise time	t_r		57		ns	
Turn-off delay time	$t_{d(off)}$		88		ns	
Fall time	t_f		57		ns	
Turn-on energy	E_{on}		1.85		mJ	
Turn-off energy	E_{off}		1.02		mJ	
Turn-on delay time	$t_{d(on)}$		32		ns	V_{GE}=15 V, V_{CC}=400 V, R_G=10 Ω, I_C=40 A
Rise time	t_r		26		ns	
Turn-off delay time	$t_{d(off)}$		97		ns	
Fall time	t_f		16		ns	
Turn-on energy	E_{on}		0.53		mJ	
Turn-off energy	E_{off}		0.27		mJ	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		92		nC	V_{GE}=15 V, V_{CC}=520 V, I_C=80 A
Gate-emitter charge	Q_{ge}		42		nC	
Gate-collector charge	Q_{gc}		18		nC	

Note

1) Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) Pd is based on max. junction temperature, using junction-case thermal resistance.
4) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.

Electrical Characteristics Diagrams

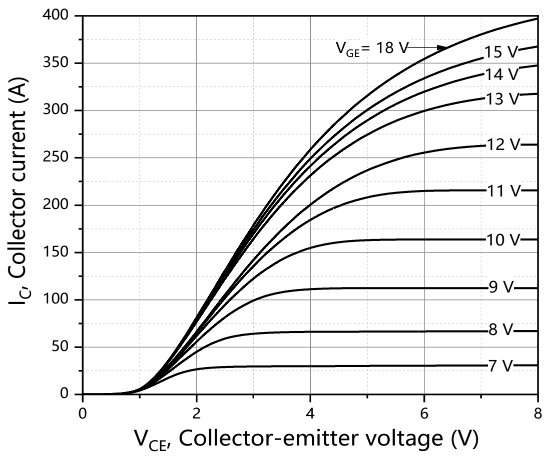


Figure 1. Typical output characteristics
(T_{vj}=25°C)

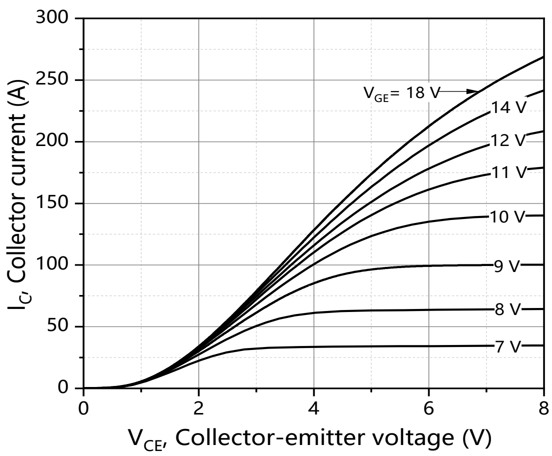


Figure 2. Typical output characteristics
(T_{vj}=150°C)

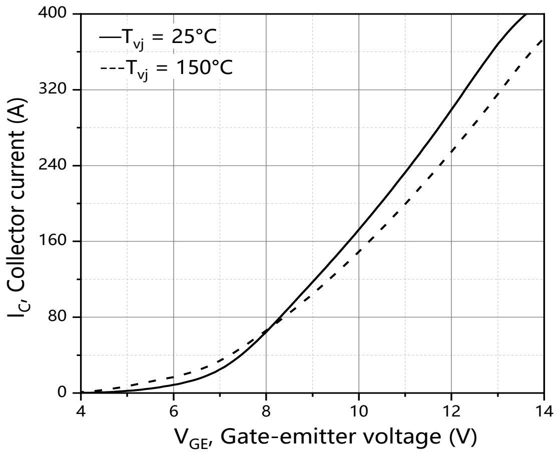


Figure 3. Typical transfer characteristics
(V_{CE}=20V)

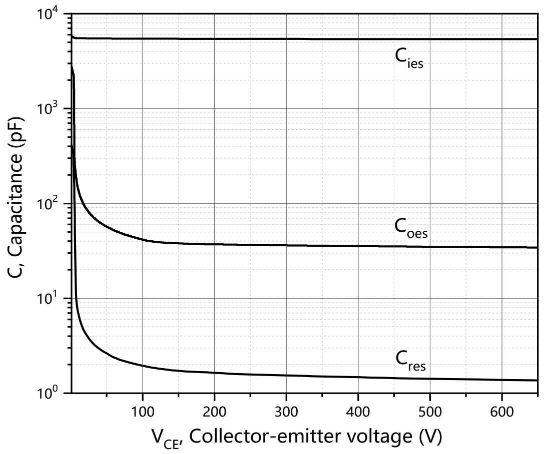


Figure 4. Typical capacitance
(V_{GE}=0V, f=100 kHz)

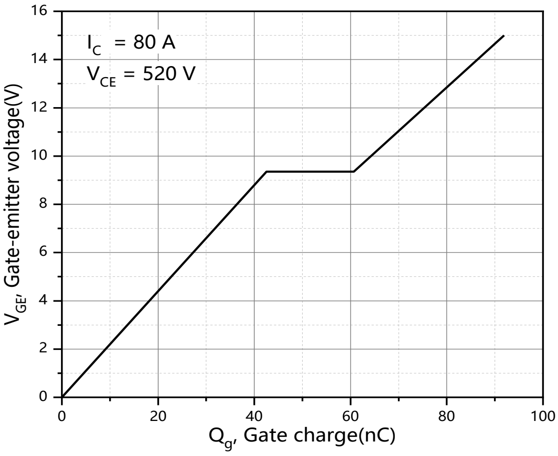


Figure 5. Typical gate charge

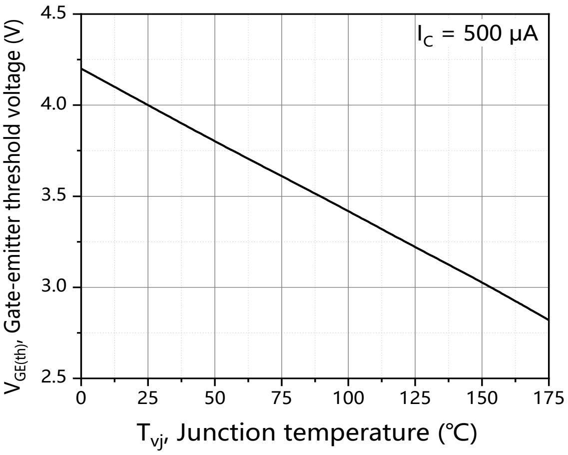


Figure 6. Gate-emitter threshold voltage

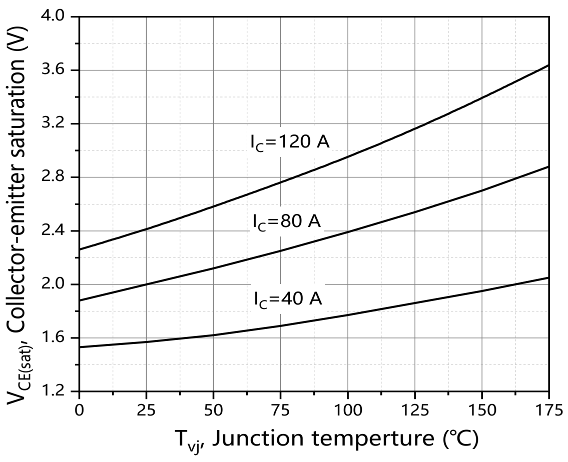


Figure 7. Typical collector-emitter voltage

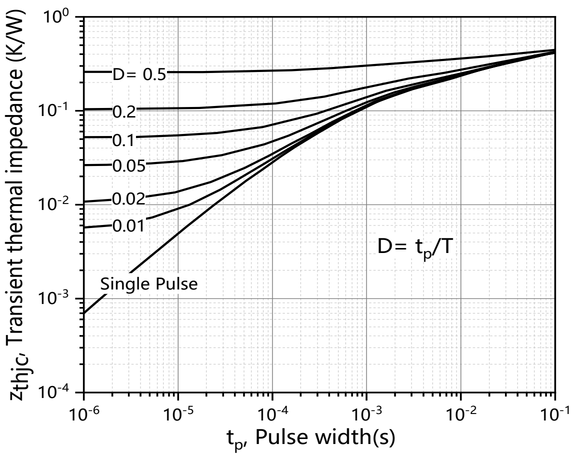


Figure 8. IGBT transient thermal impedance

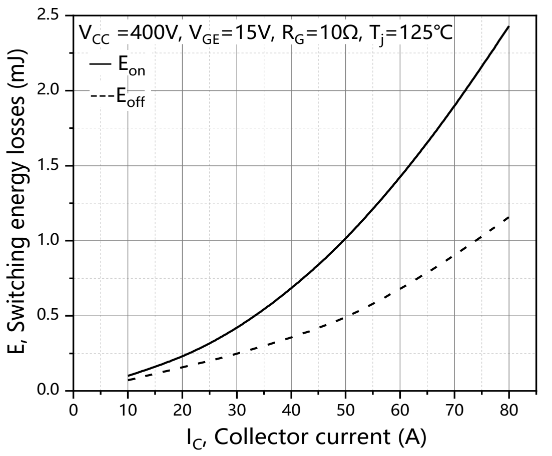
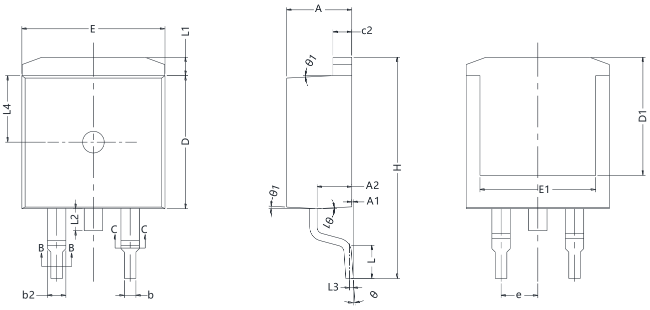
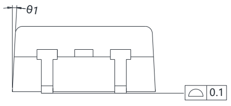


Figure 9. Switching energy vs. collector current

Package Information





Symbol	mm		
	Min	Nom	Max
A	4.40	4.50	4.60
A1	0.00	0.10	0.25
A2	2.20	2.40	2.60
b	0.76	-	0.89
b2	1.23	-	1.37
c	0.47	-	0.60
c1	0.46	0.51	0.56
c2	1.25	1.30	1.35
D	9.10	9.20	9.30
D1	8.00	-	-
E	9.80	9.90	10.00
E1	7.80	-	-
e	2.54BSC		
H	14.90	15.30	15.70
L	2.00	2.30	2.30
L1	1.17	1.27	1.40
L2	-	-	1.75
L3	0.25BSC		
L4	4.60 REF		
θ	0°	-	8°
θ1	1°	3°	5°

Version 1: TO263-J package outline dimension

Ordering Information

Package Type	Units/ Reel	Tubes/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO263-J	800	1	800	10	8000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
OST80N65K2F-D	TO263	yes	yes	yes

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