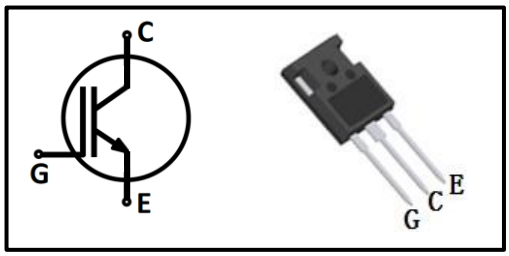
Features

- Easy parallel switching capability due to positive temperature coefficient in V_{CEsat}
- Low V_{CEsat}, fast switching
- High ruggedness, good thermal stability
- Very tight parameter distribution

Applications

- UPS
- PFC
- PTC Heater
- Climate Compressor

Type	Marking	Package Code
MPGW40N65E	MPG40N65E	TO-247-3



Maximum Rated Values [1]

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CE}	650	V
DC collector current[2]			A
T_C=25℃	I_C	80	
T_C=100℃		40	
Pulsed collector current[3]	I_{Cpuls}	160	
Gate-emitter voltage	V_{GE}	±20	V
Transient Gate-emitter voltage（t_p≤10us)		±30	
Power dissipation			W
T_C=25℃	P_{tot}	250	
T_C=100℃		125	
Operating junction temperature	T_j	-55~175	℃
Storage temperature	T_{stg}	-55~150	

1:Reference standard: JESD-022 2: limited by Tjmax 3: Tp limited by Tjmax ;

Thermal Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
IGBT thermal resistance, junction-case	R_{thJC}	-	-	0.6	K/W
Thermal Resistance, junction-ambient	R_{thJA}	-	-	40	

Electrical Characteristics（at Tj=25℃, unless otherwise specified）

Static Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-emitter breakdown voltage	$V_{(BR)CES}$	V_{GE}=0V, I_C=0.25mA	650	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	V_{GE}=15V, I_C=40A T_j=25℃	-	1.50		
		T_j=125℃	-	1.70	-	
		T_j=150℃	-	1.80	-	
G-E threshold voltage	$V_{GE(th)}$	I_C=0.8mA,V_{CE}=V_{GE}		5.5		
C-E leakage current	I_{CES}	V_{CE}=650V, V_{GE}=0V T_j=25℃	-	-	0.1	mA
		T_j=150℃	-	-	1	
G-E leakage current	I_{GES}	V_{CE}=0V, V_{GE}=20V	-	-	250	nA
Transconductance	g_{FS}	V_{CE}=20V, I_C=40A	-	-	-	S

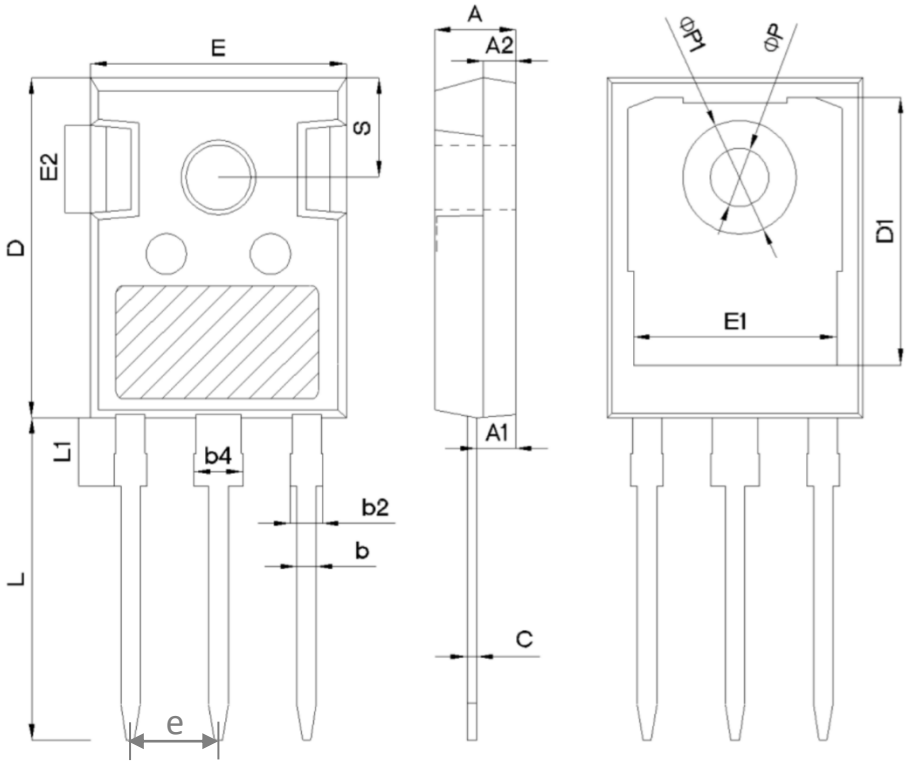
Dynamic Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input capacitance	C_{iss}	V_{CE}=25V, V_{GE}=0V, f=1MHz	-	2700	-	pF
Output capacitance	C_{oss}		-	150	-	
Reverse transfer capacitance	C_{rss}		-	40	-	
Gate charge	Q_G	V_{CC}=100V, I_C=40A, V_{GE}=15V	-	110	-	nC

IGBT Switching Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Turn-on delay time	$t_{d(on)}$	T_j=25℃, V_{CC}=400V, I_C=40A, V_{GE}=0/15V, R_G=10Ω, Inductive load (Test with MPBW40N65E)	-	85	-	ns
Rise time	t_r		-	55	-	
Turn-off delay time	$t_{d(off)}$		-	190	-	
Fall time	t_f		-	40	-	
Turn-on energy	E_{on}		-	0.94	-	mJ
Turn-off energy	E_{off}		-	0.85	-	
Total switching energy	E_{ts}		-	1.79	-	
Turn-on delay time	$t_{d(on)}$	T_j=150℃, V_{CC}=400V, I_C=40A, V_{GE}=0/15V, R_G=10Ω, Inductive load (Test with MPBW40N65E)	-	85	-	ns
Rise time	t_r		-	70	-	
Turn-off delay time	$t_{d(off)}$		-	210	-	
Fall time	t_f		-	80	-	
Turn-on energy	E_{on}		-	1.94	-	mJ
Turn-off energy	E_{off}		-	1.12	-	
Total switching energy	E_{ts}		-	3.06	-	

TO-247-3



SYMBOL	mm		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44BSC		
L	19.62	19.92	20.22
L1	-	-	4.30
ΦP	3.40	3.60	3.80
ΦP1	-	-	7.30
S	6.15BSC		

Revision History：

Revision	Date	Subjects (major changes since last revision)
1.0	2022-09	Initial Version

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