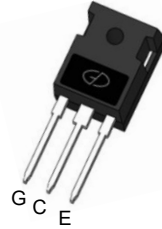


60A,1250V Insulated Gate Bipolar Transistor

Features

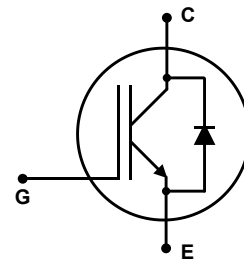
- Trench FS technology offering
- High speed switching
- Low gate charge and VCE(sat)
- High ruggedness, temperature stable behavior
- Maximum junction temperature 175°C



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Applications

- Solar Inverters
- Uninterruptible power supplies
- Motor drives
- Air condition



Absolute Maximum Ratings (@T _J =25°C unless otherwise noted)			
Parameter	Symbol	Ratings	Unit
Collector-Emitter Voltage	V _{CES}	1250	V
Gate- Emitter Voltage	V _{GES}	±30	V
Collector Current	I _C	120	A
Collector Current @TC = 100 °C		60	
Pulsed Collector Current, tp limited by Tjmax	I _{Cpuls}	240	A
Diode Continuous Forward Current @TC = 25 °C	I _F	120	A
Diode Continuous Forward Current @TC = 100 °C		60	
Power Dissipation @ TC = 25°C	P _D	394	W
Power Dissipation @ TC = 100°C		197	
Operating Junction	T _J	-55 to +175	°C
Storage Temperature Range	T _{STG}	-55 to +175	°C

Thermal Characteristics			
Parameter	Symbol	Max	Unit
Thermal Resistance ,Junction-to-Ambient	$R_{\theta JA}$	40	$^{\circ}\text{C}/\text{W}$
Thermal Resistance Junction-to-Case for IGBT	$R_{\theta JC}$	0.38	$^{\circ}\text{C}/\text{W}$
Thermal Resistance Junction-to-Case for Diode	$R_{\theta JC}$	0.69	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics (@T _J =25°C unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage	V _{(BR)CES}	V _{GE} =0V, I _{CE} =1mA	1250	--	--	V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _C =60A, V _{GE} =15V	--	1.7	2.0	V
Gate Threshold Voltage	V _{GE(th)}	I _C =1mA, V _{CE} =V _{GE}	4.5	--	6.5	V
Collector-Emitter Leakage Current	I _{CES}	V _{GE} =0V, V _{CE} =1200V	--	--	1	μA
Gate to Emitter Reverse Leakage	I _{GES}	V _{GE} =30V, V _{CE} =0V	--	--	100	nA
		V _{GE} =-30V, V _{CE} =0V	--	--	-100	
Input capacitance	C _{ies}	V _{GS} = 0V, V _{DS} = 25V f = 1MHz	--	8086	--	pF
Output capacitance	C _{oes}		--	241	--	
Reverse transfer capacitance	C _{res}		--	161	--	
Turn-on delay time	t _{d(on)}	V _{CC} =600V, I _C =60A, V _{GE} =0/15V, R _g =10Ω	--	64	--	ns
Rise time	t _r		--	33	--	
Turn-Off delay time	t _{d(off)}		--	579	--	
Fall time	t _f		--	54	--	
Turn-On Switching Loss	E _{on}		--	5.78	--	mJ
Turn-Off Switching Loss	E _{off}		--	3.84	--	
Total Switching Loss	E _{ts}		--	9.62	--	
Total Gate Charge	Q _g	V _{CC} =480V, I _C =60A, V _{GE} =15V	--	240	--	nC
Gate to Emitter Charge	Q _{ge}		--	65	--	
Gate to Collector Charge	Q _{gc}		--	95	--	
Short circuit collector current Max.1000 short circuits Time between short circuits: ≥1.0s	I _{C(SC)}	V _{GE} =15V, V _{CC} ≤600V, t _{sc} ≤10μs	--	620	--	A

Electrical Characteristics of the Diode (@T _J =25°C unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Diode Forward Voltage	V _{FM}	I _F =60A	--	2.44	3	V
Reverse Recovery Time	t _{rr}	I _F =60A, V _{GE} =0/15V, V _R =600V	--	138	--	ns
Reverse Recovery Charge	Q _{rr}		--	1.71	--	μC
Diode Peak Reverse Recovery Current	I _{RRM}		--	26.4	--	A

Ratings and Characteristics Curves

($T_A = 25^\circ\text{C}$ unless otherwise noted)

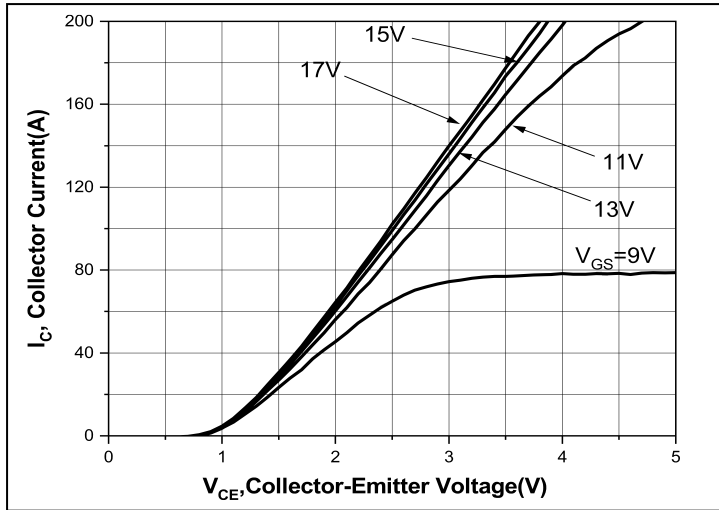


Figure1. Typical Output Characteristics

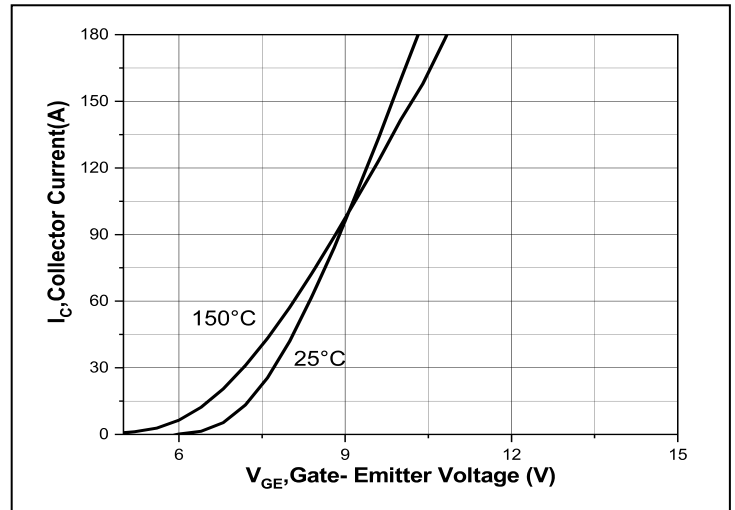


Figure2. Typical Transfer Characteristics

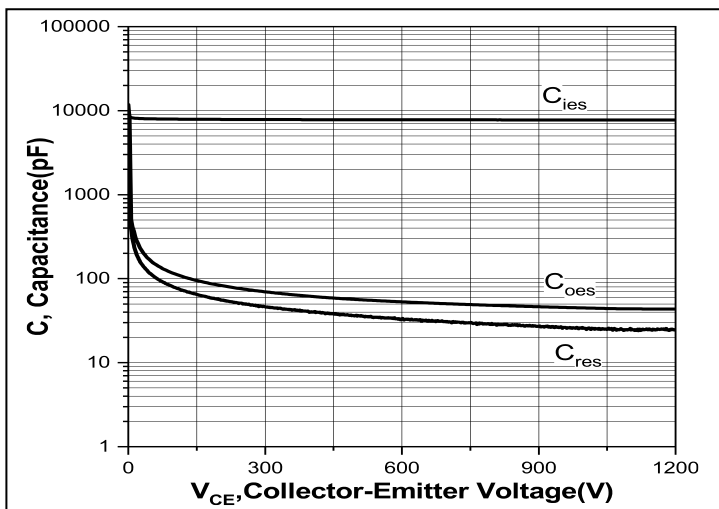


Figure3. Typical Capacitance

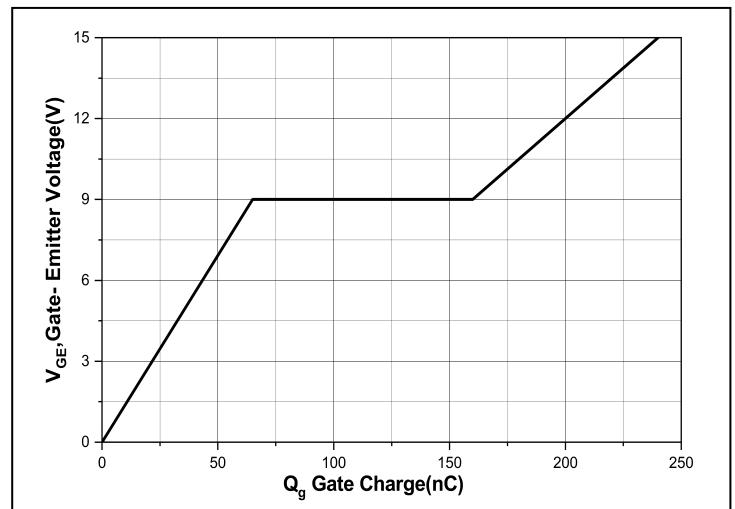


Figure4. Typical Gate Charge

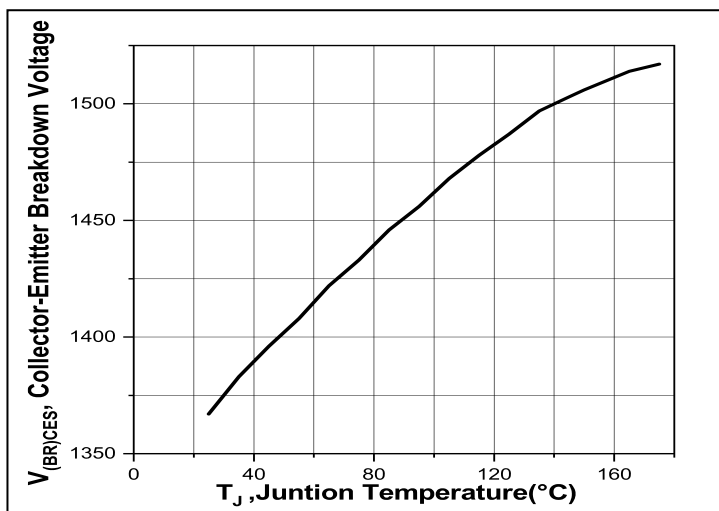


Figure5. Collector-Emmitter Breakdown Voltage vs. Temperature

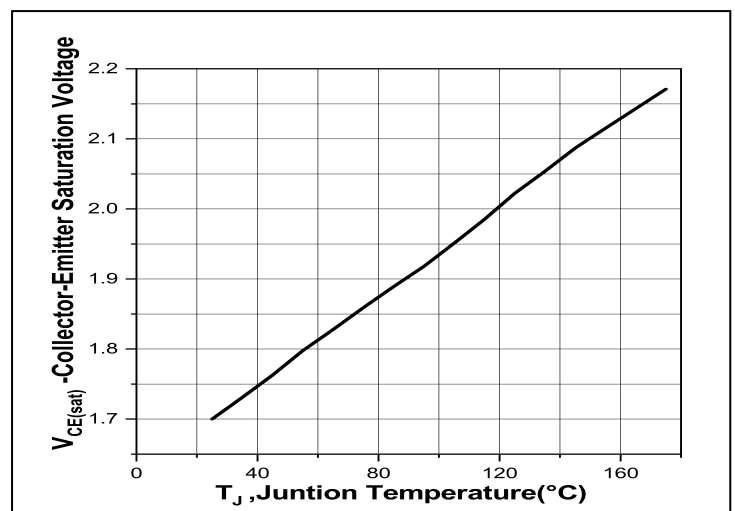


Figure6. Collector-Emmitter Saturation Voltage vs. Temperature

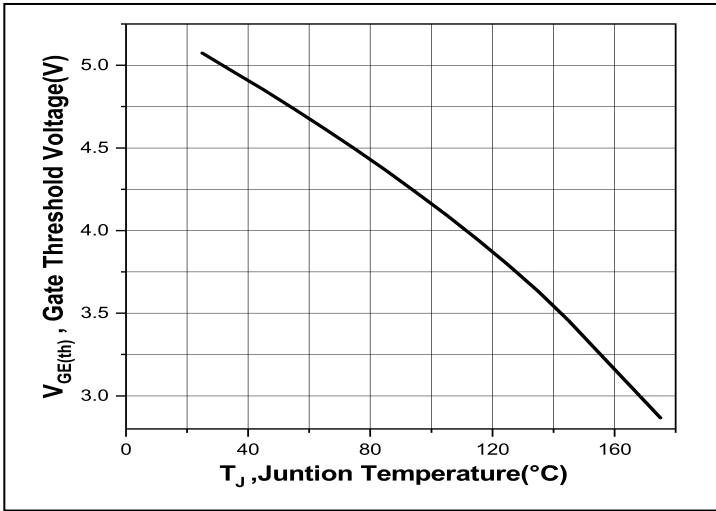


Figure7. Gate Threshold Voltage vs. Temperature

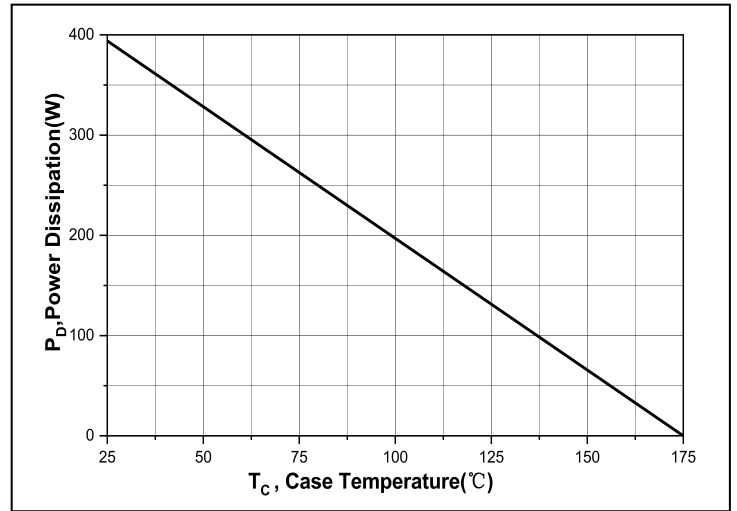


Figure8. Power Dissipation vs. Case Temperature

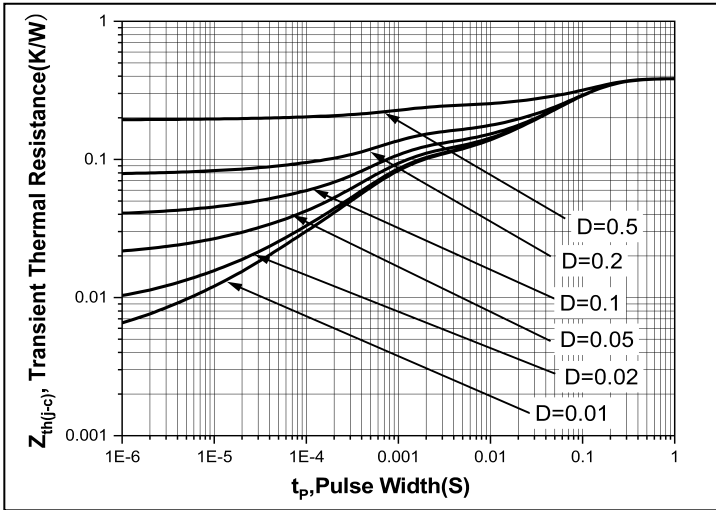


Figure9. IGBT transient thermal resistance ($D = t_p/T$)

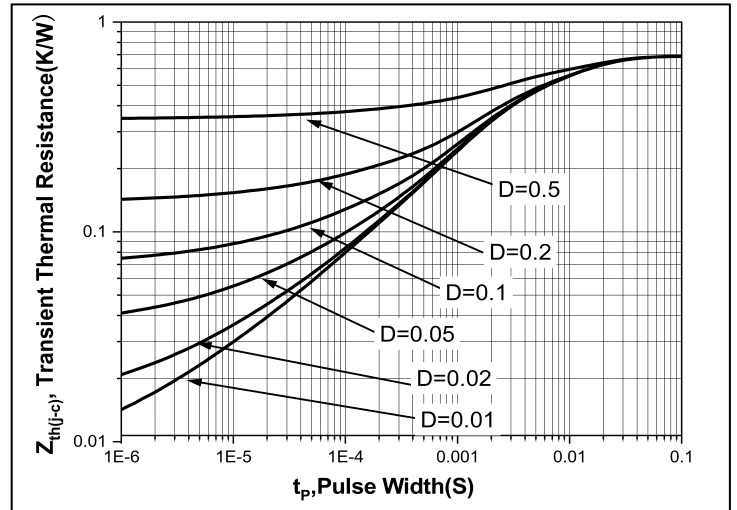
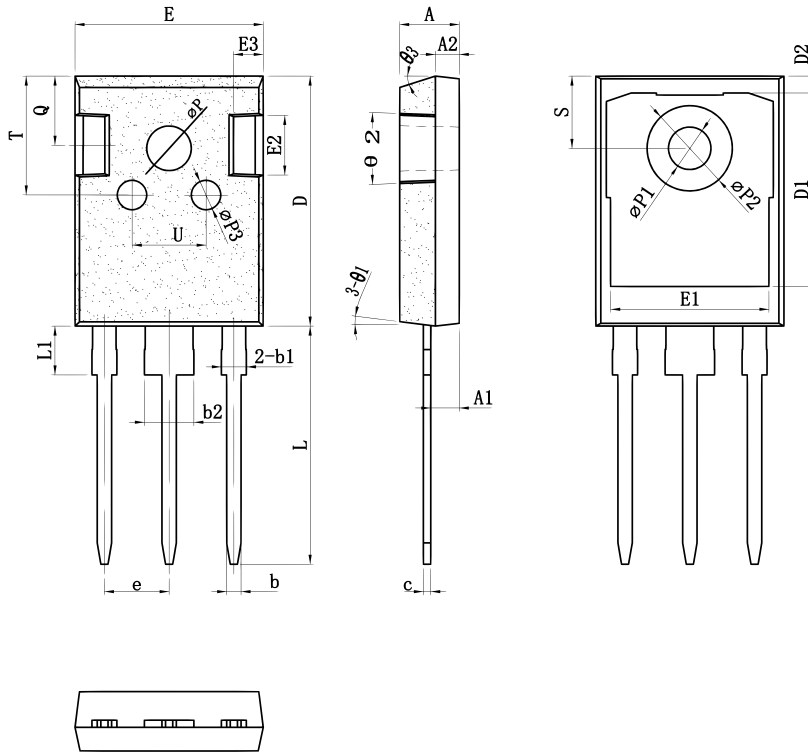


Figure10. Diode transient thermal impedance as a function of pulse width ($D = t_p/T$)

Package Outline Dimensions (Unit: millimeters)

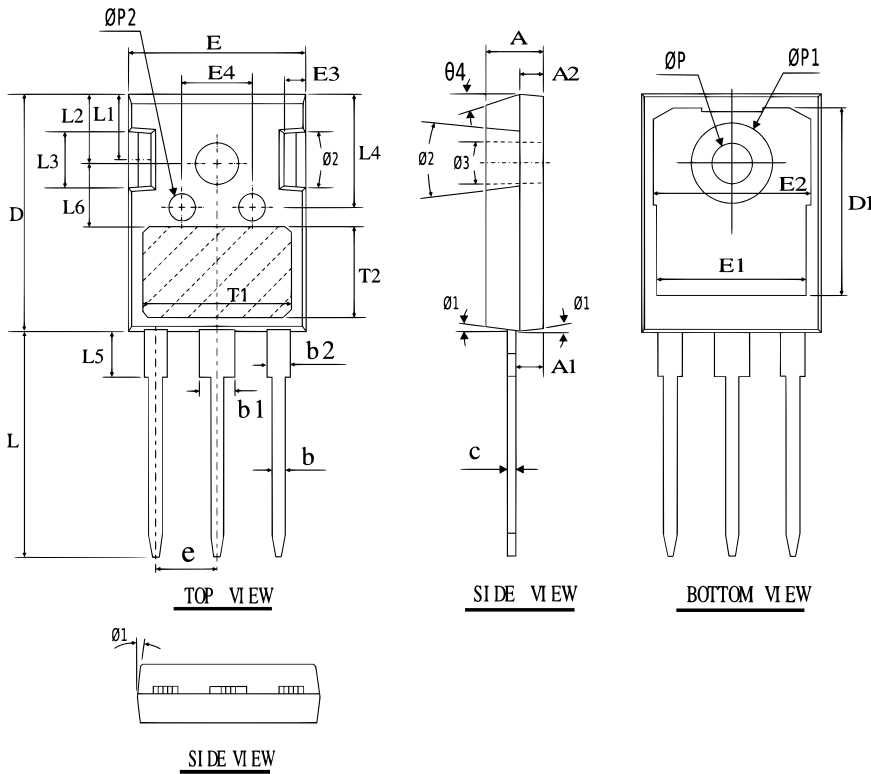
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Option B:



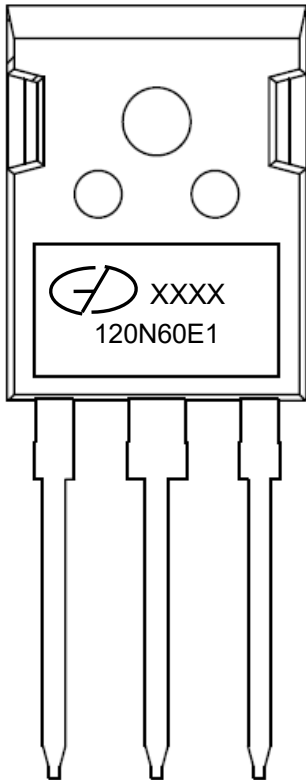
SYMBOL	mm		
	MIN	NOM	MAX
*A	4.90	5.00	5.10
*A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
*b	1.15	1.20	1.25
*b1	1.95	2.10	2.25
*b2	2.95	3.10	3.25
*c	0.55	0.60	0.65
*D	20.90	21.00	21.10
D1	16.35	16.55	16.75
D2	1.05	1.20	1.35
*E	15.70	15.80	15.90
E1	13.10	13.25	13.40
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
*e	5.40	5.44	5.48
*L	19.80	19.98	20.15
*L1	-	-	4.30
*ΦP	3.60	3.70	3.80
*ΦP1	3.45	3.55	3.65
ΦP2	7.03	7.18	7.33
ΦP3	2.40	2.50	2.60
Q	5.60	5.80	6.00
*S	6.05	6.15	6.25
T	9.80	10.00	10.20
U	6.00	6.20	6.40
θ1	5°	7°	9°
θ2	1°	3°	5°
θ3	13°	15°	17°

Option H:




SYMBOL	MN	NOM	MAX
A	4.80	5.00	5.20
A1	2.20	2.40	2.60
A2	1.85	2.00	2.15
b	1.10	1.20	1.30
b1	2.80	3.00	3.20
b2	1.80	2.00	2.20
C	0.52	0.62	0.72
D	20.35	20.65	20.95
D1	16.35	16.55	16.75
E	15.50	15.80	16.10
E1	13.10	13.30	13.50
E2	13.80	14.00	14.20
E3	1.45	1.60	1.75
E4	6.00	6.20	6.40
L	19.80	20.00	20.20
L1	5.88	5.98	6.08
L2	5.88	5.98	6.08
L3	4.90	5.00	5.10
L4	9.70	9.80	9.90
L5	4.10	4.30	4.50
theta 1	4°	7°	10°
theta 2	11°	14°	17°
theta 3	1°	--	2°
theta 4	10°	15°	20°
phi P	3.35	3.60	3.85
phi P1	--	--	7.30
phi P2	2.25	2.50	2.75
e		5.44BSC	
T1		12.80REF	
T2		7.80REF	
L6		5.50REF	

Marking Outline



Part Name: GIT120N60E1

1. Logo Mark: 
2. P/N Mark: 120N60E1
3. Date Code: XXXX

Revision History

Version	Date	Major Changes
Rev.A	2025.02.07	Official Release

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