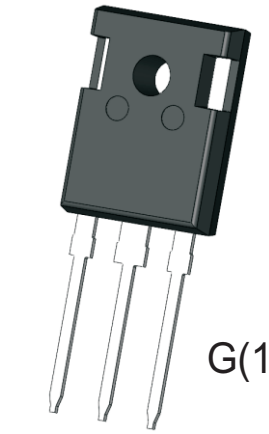
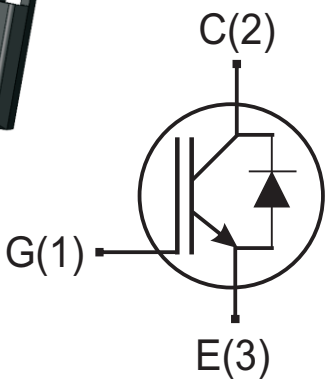
1200V,40A,Trench field-stop , IGBT

TO-247-3L (*Prefix :W)

V_{CES}	1200V
I_C (Tc 100℃)	40A
$V_{CE(sat)(typ)}$	1.7V



RoHS COMPLIANT



SYMBOL

DESCRIPTION
- Positive temperature coefficient
- Low VCEsat
- Low saturation voltage
- High switching frequency
- Easy paralleling
- Rohs Compliant

APPLICATIONS
- Motor drives
- Inverters
- Uninterruptible Power Supplies
- Converters

ABSOLUTE MAXIMUM RATINGS (TA=25°C, unless otherwise specified)

PARAMETER		Symbols	RATINGS	Units
Collector-emitter voltage		V_{CES}	1200	V
Gate-emitter voltage		V_{GES}	±20	V
Continuous Drain Current	Tc=25°C	I_C	80	A
	Tc=100°C		40	
Pulsed Drain Current		I_{CM}	160	A
Diode Forward Current	Tc=25°C	I_F	40	A
Power Dissipation (Tc = 25°C)		P_D	416	W
Operating junction temperature		T_j	-55 ~ +150	°C
storage temperature		T_{stg}	-55 ~ +150	°C

Thermal Resistance

PARAMETER	Symbols	RATINGS	Units
Thermal resistance IGBT junction – case.	R_{thJC}	0.3	°C/W
Thermal resistance Diode junction – case.	R_{thJC}	0.4	°C/W
Thermal resistance, junction – ambient	R_{thJA}	40	°C/W

Electrical Characteristics of the IGBT（Tj= 25℃unless otherwise specified)

PARAMETER	Symbols	TEST CONDITIONS	Min	Typ	Max	Units
Static						
Collector-emitter breakdown voltage	$V_{(BR)CES}$	V_{GE}=0V,I_{CE}=0.25mA	1200			V
Zero gate voltage collector current	I_{CES}	V_{CE}=1200V,V_{GE}=0V			100	uA
Gater-emitter leakage currentt	I_{GES}	V_{GE}=±20V,V_{CE}=0V			±100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	V_{GE}=15V,IC=40A		1.7	2.0	V
Gate-emitter threshold voltage	$V_{GE(TH)}$	V_{GE}=V_{CE},IC=1mA	5.4	5.7	6.0	V
Dynamic						
Input Capacitance	Cies	V_{CE}=30V,		3230		pF
Output Capacitance	Coes	V_{GE}=0V,		198		pF
Reverse Transfer Capacitance	Cres	f=1.0MHz		29		pF
Gate resistance	RG	VDS=0V,F_{REQ}=1.00MHz		2.6		Ω

Electrical Characteristics of the Diode（Tj= 25℃unless otherwise specified)

PARAMETER	Symbols	TEST CONDITIONS	Min	Typ	Max	Units
Static						
Diode Forward Voltage	VF	V_{GE}=0V,IF=40A		1.7	2.05	V
Dynamic						
Diode reverse recovery time	TRR	IF=0.5A,IR=1.0A Irr=0.25A			85	ns

Switching Characteristic, Inductive Load

PARAMETER	Symbols	TEST CONDITIONS	Min	Typ	Max	Units
Dynamic						
Turn-on Delay Time	td(on)	VCC= 600V, IC=40A,		40		ns
Rise Time	tr	VGE=15V,Rg=10Ω		89		ns
Turn-on Energy	Eon	Tj=25℃		4.0		mJ
Turn-off Delay Time	td(off)			380		ns
Fall Time	tf			47		ns
Turn-off Energy	Eoff			1.8		mJ

Typical Characteristics

Fig.1 Typical output characteristic

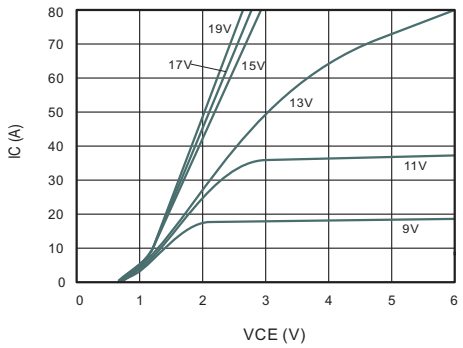


Fig.2 Capacitance Characteristics

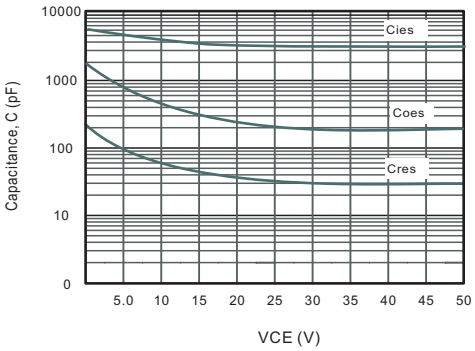


Fig.3 Power Dissipation

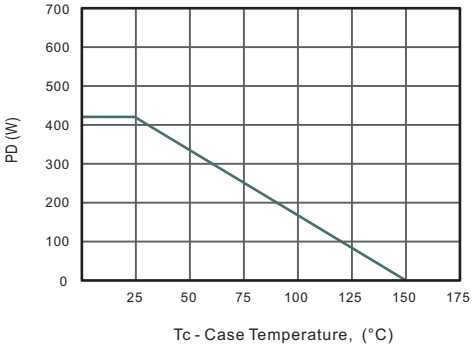


Fig.4 Collector Current Derating

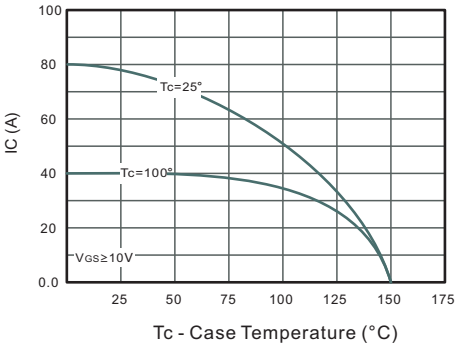


Fig.5 Typical VGE(th) as a function of TJ

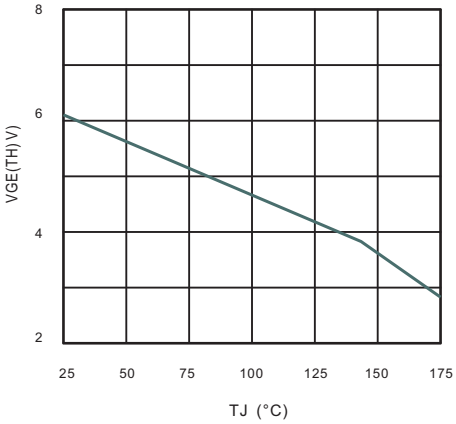


Fig.6 Drain-Source On-Resistance vs. Drain Current

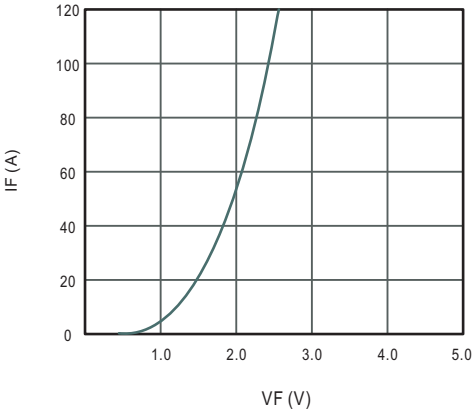


Fig.7 Safe Operating Area

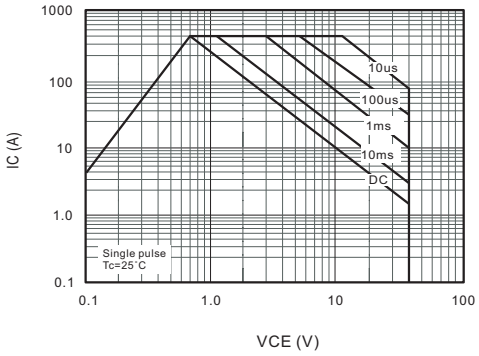


Fig.8 Max. Transient Thermal Impedance-IGBT

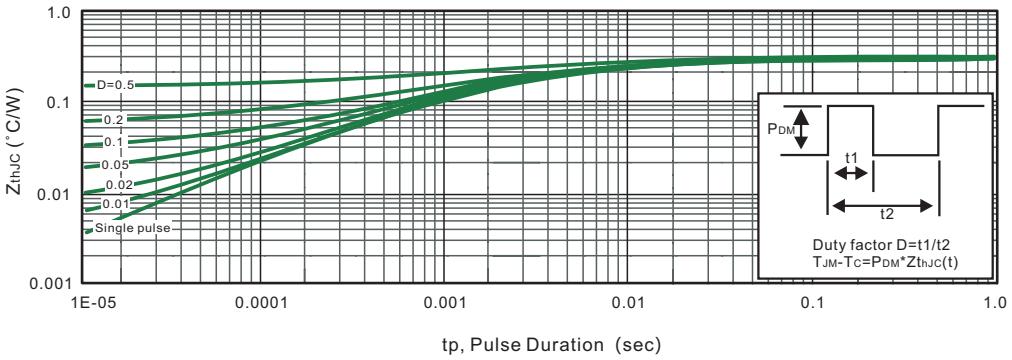
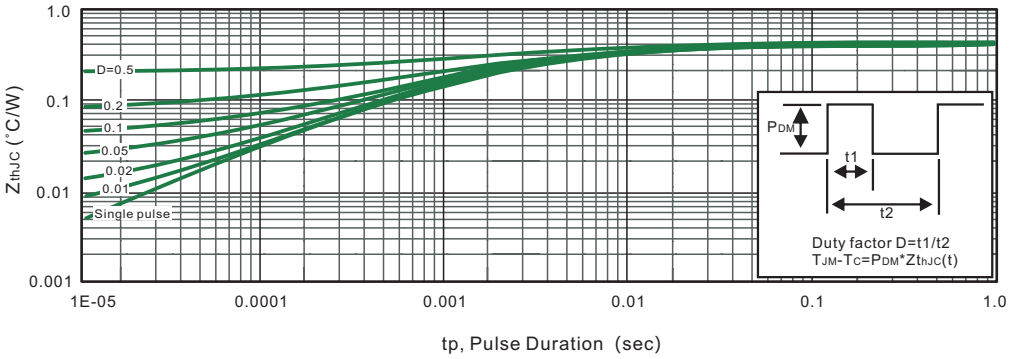
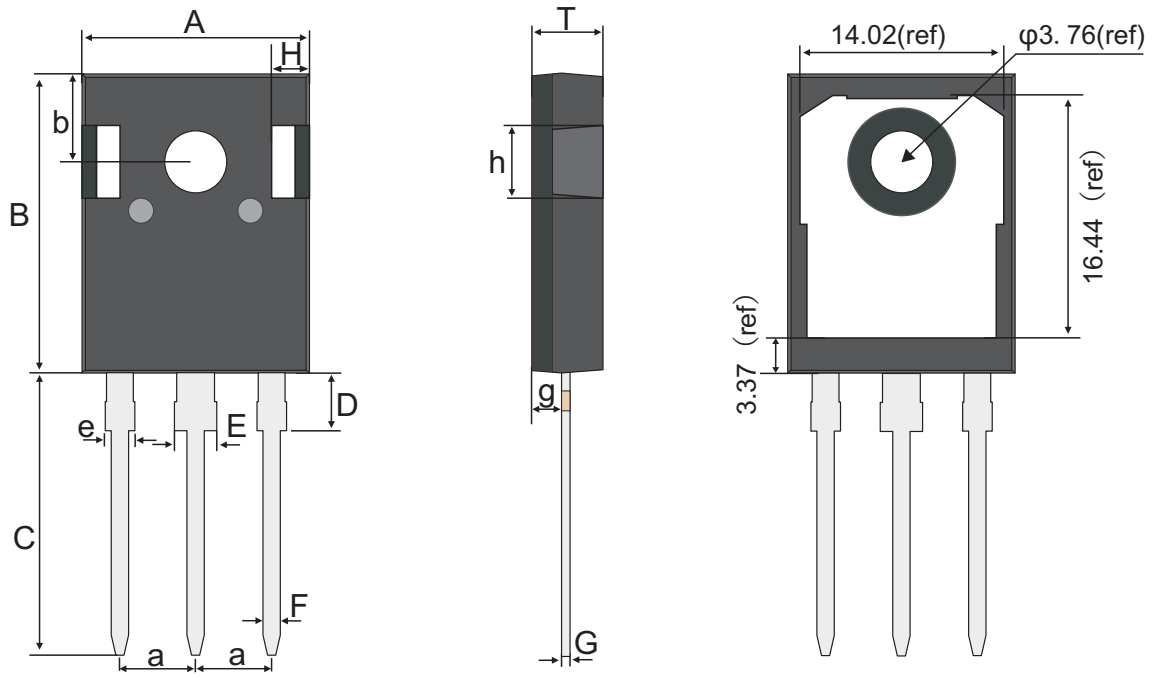


Fig.9 Max. Transient Thermal Impedance-Diode



Package Outline
Through Hole Package ; 3 leads

TO-247-3L



TO-247-3L mechanical data

UNIT		A	a	B	b	C	D	E	e	F	G	g	H	h	T
mm	max	16.01	5.54	21.18	6.26	20.2	4.25	3.25	2.2	1.3	0.7	2.49	2.71	5.37	5.2
	typ	15.81	5.44	20.98	6.16	20.0	4.15	3.10	2.05	1.2	0.6	2.39	2.51	5.17	5.0
	min	15.61	5.34	20.78	6.06	19.8	4.05	2.95	1.9	1.1	0.5	2.29	2.31	4.97	4.8
mil	max	630	218	834	246	795	167	128	87	51	28	98	107	211	205
	typ	622	214	826	243	787	163	122	81	47	24	94	99	204	197
	min	615	210	818	239	780	159	116	75	43	20	90	91	196	189

Marking

Type number	Marking code
GW40NPD120SN1	GW40NPD120SN1

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