



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

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

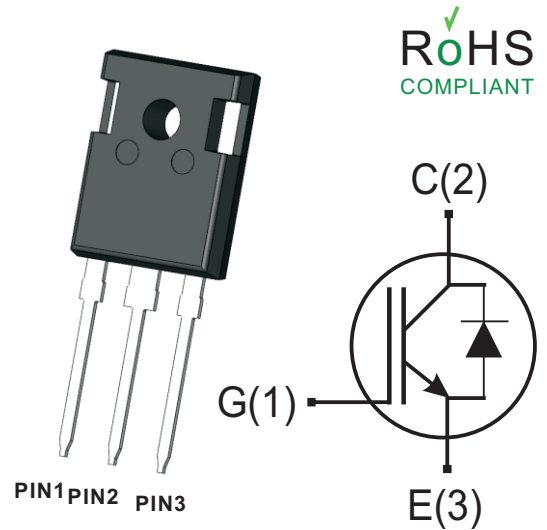
V _{CES}	1200V
I _c (T _c 100°C)	40A
V _{CE(sat)} (typ)	1.9V

DESCRIPTION

- Positive temperature coefficient
- Low V_{CEsat}
- Low saturation voltage
- High switching frequency
- Easy paralleling
- Rohs Compliant

APPLICATIONS

- Motor drives
- Inverters
- Uninterruptible Power Supplies
- Converters



ROHS
COMPLIANT

SYMBOL

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	I _c	T _c =25°C	80
		T _c =100°C	40
Pulsed Drain Current	I _{CM}	160	A
Diode Forward Current	I _F	40	A
Power Dissipation (T _c = 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°C 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	μA
Gate-emitter leakage current	I_{GES}	$V_{GE}=\pm 20V, V_{CE}=0V$			± 100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=40A$		1.9	2.2	V
Gate-emitter threshold voltage	$V_{GE(TH)}$	$V_{GE}=V_{CE}, I_C=1mA$	5.4	5.7	6.0	V
Dynamic						
Input Capacitance	C_{ies}	$V_{CE}=30V,$		9900		μF
Output Capacitance	C_{oes}	$V_{GE}=0V,$		189		pF
Reverse Transfer Capacitance	C_{res}	$f=1.0MHz$		40		pF
Gate resistance	R_G	$V_{DS}=0V, F_{REQ}=1.00MHz$		2.0		Ω

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

PARAMETER	Symbols	TEST CONDITIONS	Min	Typ	Max	Units
Static						
Diode Forward Voltage	V_F	$V_{GE}=0V, I_F=40A$		2.0	2.4	V
Dynamic						
Diode reverse recovery time	TRR	$I_F=0.5A, I_R=1.0A$ $I_{rr}=0.25A$			75	ns

Switching Characteristic, Inductive Load

PARAMETER	Symbols	TEST CONDITIONS	Min	Typ	Max	Units
Dynamic						
Turn-on Delay Time	$t_{d(on)}$	$V_{CC}=600V, I_C=40A,$		85		ns
Rise Time	t_r	$V_{GE}=15V, R_g=10\Omega$		76		ns
Turn-on Energy	E_{on}	$T_j=25^\circ C$		2.5		mJ
Turn-off Delay Time	$t_{d(off)}$			307		ns
Fall Time	t_f			69		ns
Turn-off Energy	E_{off}			1.4		mJ



Typical Characteristics

Fig.1 Typical output characteristic

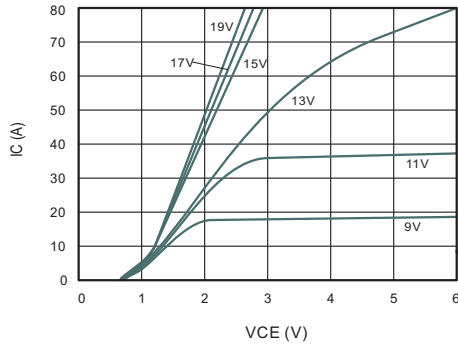


Fig.2 Capacitance Characteristics

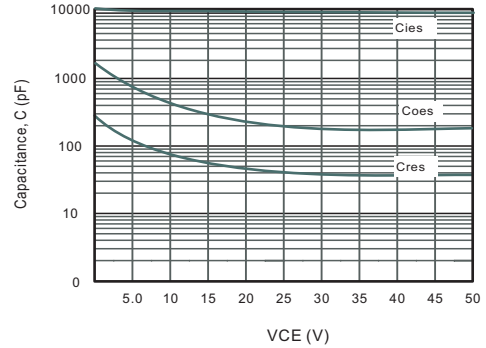


Fig.3 Power Dissipation

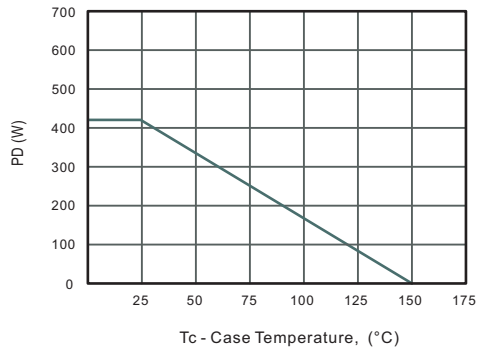


Fig.4 Collector Current Derating

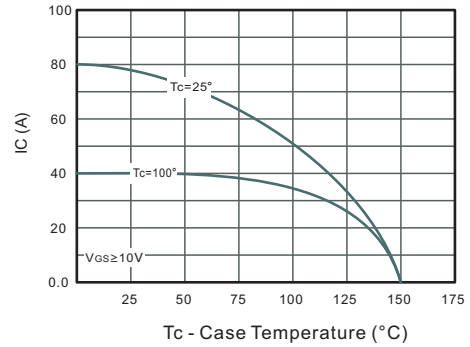


Fig.5 Typical $V_{GE(th)}$ as a function of T_J

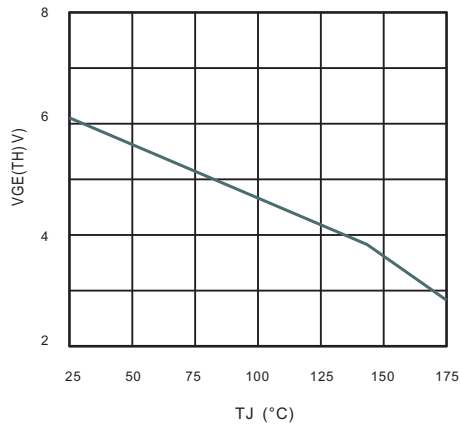


Fig.6 Drain-Source On-Resistance vs. Drain Current

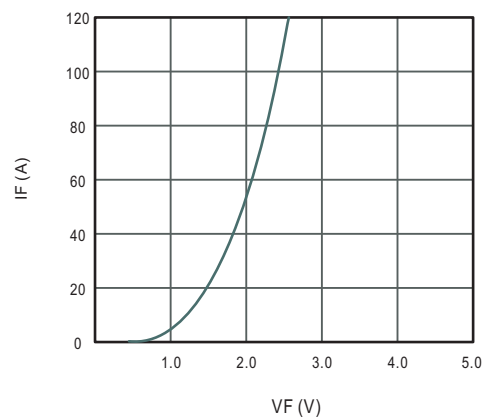




Fig.7 Safe Operating Area

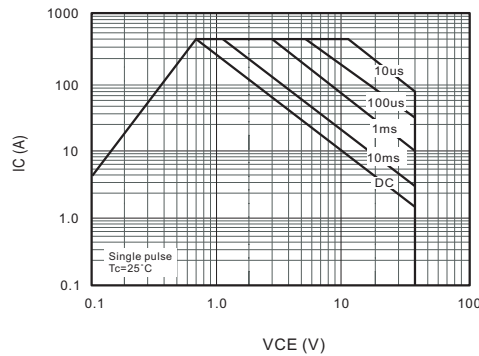


Fig.8 Max. Transient Thermal Impedance-IGBT

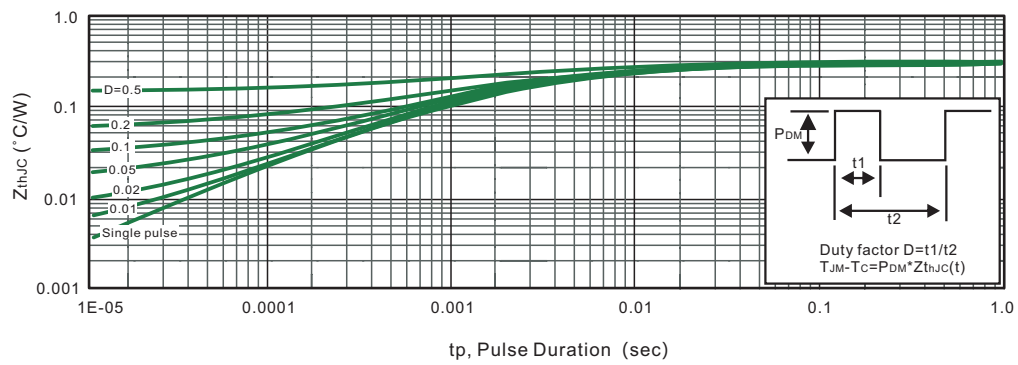
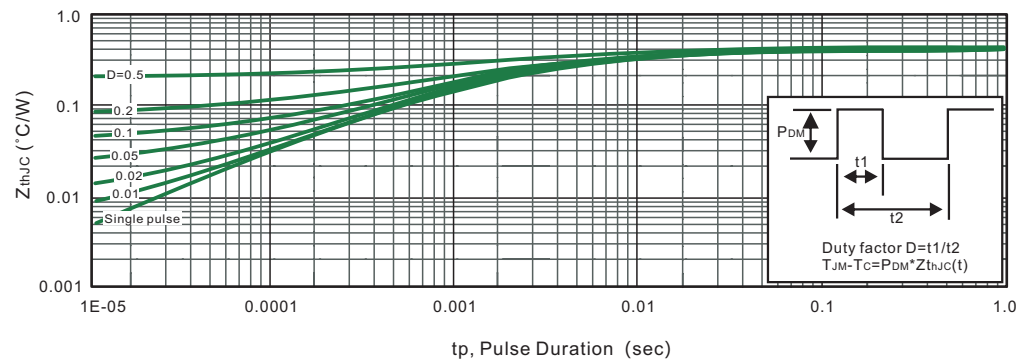


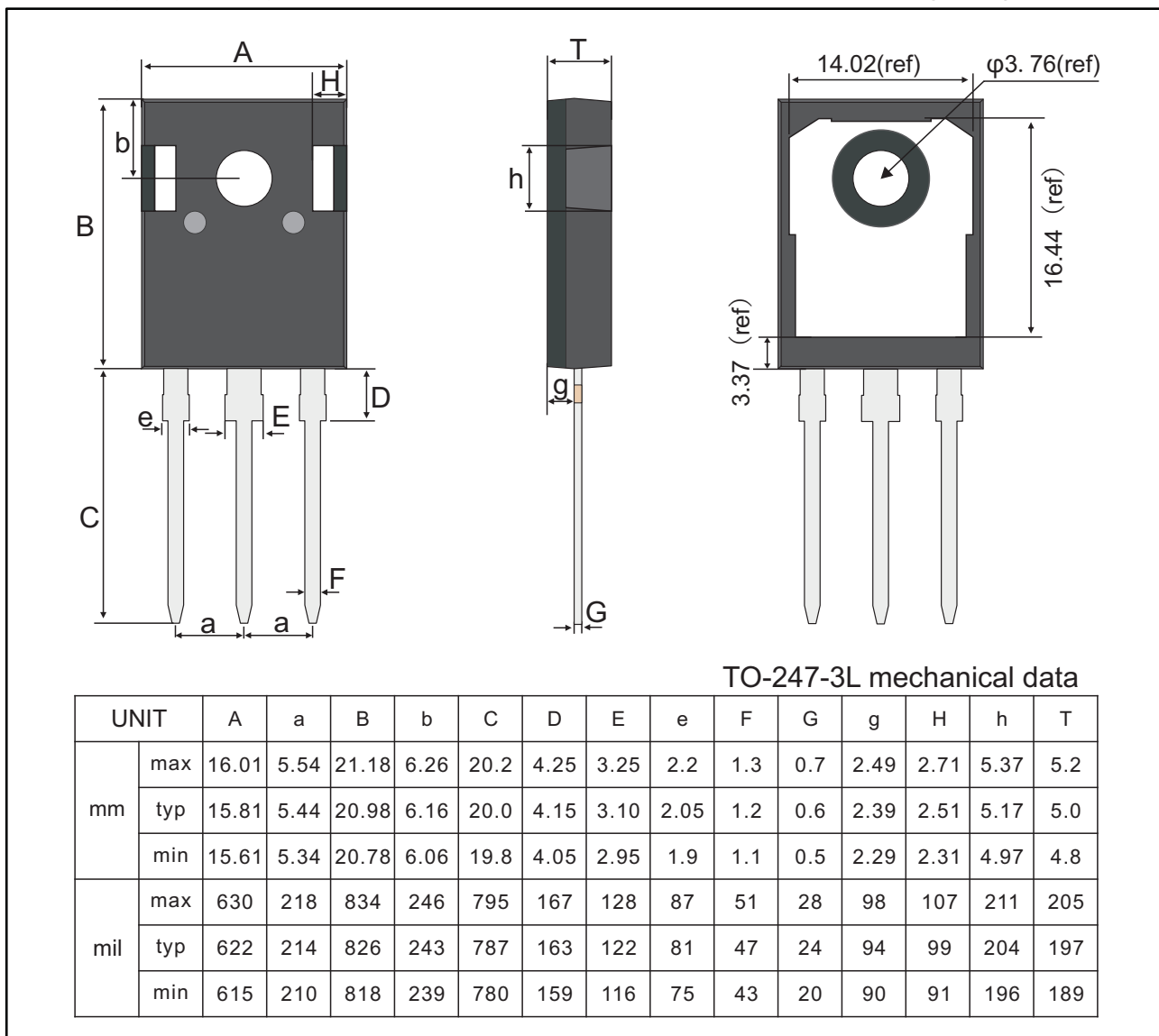
Fig.9 Max. Transient Thermal Impedance-Diode





Package Outline
Through Hole Package ; 3 leads

TO-247-3L



Marking

Type number	Marking code
GW40NPD120SN2	GW40NPD120SN2



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