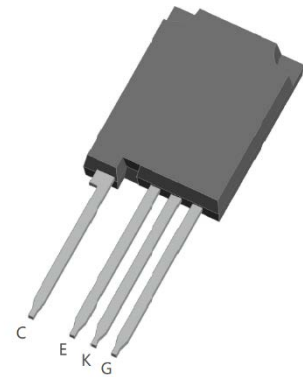
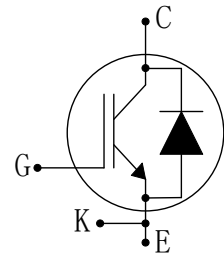


TGY140H12T

Features/产品特性

- 1200V Trench-FS Technology
1200V 沟槽栅-电场终止技术
- High speed switching, Low switching losses
高速开关, 低开关损耗
- Low saturation voltage $V_{CEsat}=1.7V$ at $T_{vj}=25^{\circ}C$
低饱和压降, $V_{CEsat}=1.7V$ @ $T_{vj}=25^{\circ}C$
- Maximum junction temperature $T_{vjmax}=175^{\circ}C$
最大结温 $T_{vjmax}=175^{\circ}C$



Typical applications

- UPS / 不间断电源
- EV-Charging / 电动汽车充电
- Inverters / 逆变器
- Welding / 焊机

Type	V_{CE}	I_C	$V_{CEsat}, T_{vj}=25^{\circ}C$	T_{vjmax}	Package
TGY140H12T	1200V	140A	1.7V	175 $^{\circ}C$	TO-247PLUS-4L

Package Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Storage temperature	T_{stg}		-55		150	$^{\circ}C$
Soldering temperature	T_{sold}	wave soldering 1.6mm(0.063 in.)form case for 10s		260		$^{\circ}C$
Thermal resistance, junction-ambient	$R_{th(j-a)}$			40		K/W
IGBT thermal resistance, junction-case	$R_{th(j-c)}$			0.12		K/W
Diode thermal resistance, junction-case	$R_{th(j-c)}$			0.19		K/W

IGBT ($T_c=25^\circ\text{C}$, unless otherwise specified.)

Parameter	Symbol	Note or test condition	Values	Unit	
Collector-emitter voltage	V_{CE}	$T_{vj} \geq 25^\circ\text{C}$	1200	V	
DC collector current, limited by T_{vjmax}	I_c	limited by bondwire	$T_c=25^\circ\text{C}$	220	A
			$T_c=100^\circ\text{C}$	180	A
Pulsed collector current, t_p limited by T_{vjmax}	I_{cpulse}		560	A	
Turn-off safe operating area		$V_{CC} \leq 800\text{V}, V_{CEpeak} < 1200\text{V}, V_{GE} = 0/15\text{V}, R_{Goff} \geq 23\Omega, T_{vj} \leq 175^\circ\text{C}$	560	A	
Gate-emitter voltage	V_{GE}		± 20	V	
Transient gate-emitter voltage	V_{GE}	$t_p \leq 0.5\mu\text{s}, D < 0.001$	± 25	V	
Power dissipation	P_{tot}		$T_c=25^\circ\text{C}$	938	W
			$T_c=100^\circ\text{C}$	469	

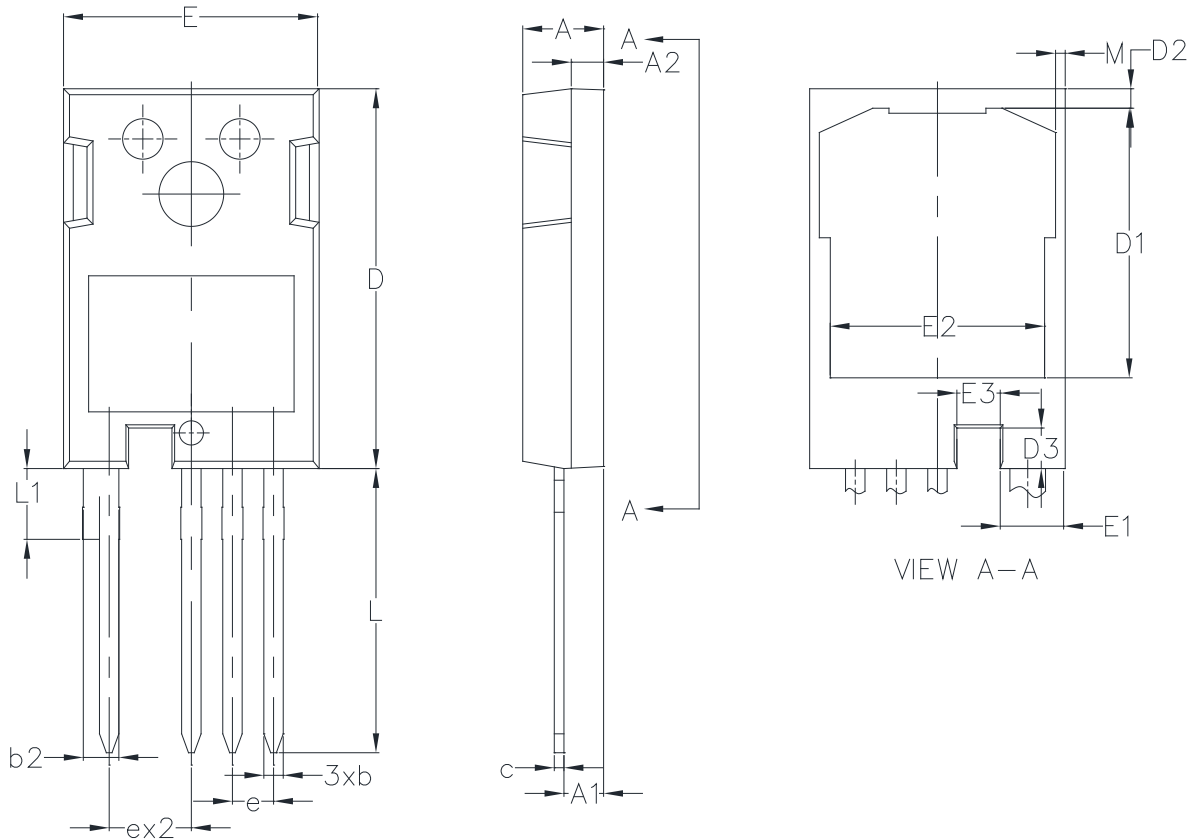
Parameter	Symbol	Note or test condition	Values			Unit	
			Min.	Typ.	Max.		
Collector-emitter saturation voltage	V_{CEsat}	$I_c=140\text{A}, V_{GE}=15\text{V}$	$T_{vj}=25^\circ\text{C}$		1.7	2.15	V
			$T_{vj}=175^\circ\text{C}$		2.15		
Gate-emitter threshold voltage	V_{Geth}	$I_c=2\text{mA}, V_{CE}=V_{GE}$	4.7	5.5	6.2	V	
Zero gate-voltage collector current	I_{CES}	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}$			40	μA	
Gate-emitter leakage current	I_{GES}	$V_{CE}=0\text{V}, V_{GE}=20\text{V}$			100	nA	
Input capacitance	C_{ies}	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=100\text{kHz}$		29.5		nF	
Output capacitance	C_{oes}	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=100\text{kHz}$		380		pF	
Reverse transfer capacitance	C_{res}	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=100\text{kHz}$		120		pF	
Gate charge	Q_G	$V_{CC}=960\text{V}, I_c=140\text{A}, V_{GE}=15\text{V}$		TBD		nC	
Turn-on delay time	$t_{d(on)}$		$T_{vj}=25^\circ\text{C}$		65	ns	
			$T_{vj}=175^\circ\text{C}$		60		
Rise time	t_r	$I_c=140\text{A}, V_{CC}=600\text{V}, V_{GE}=-1/15\text{V},$	$T_{vj}=25^\circ\text{C}$		23	ns	
			$T_{vj}=175^\circ\text{C}$		28		
Turn-off delay time	$t_{d(off)}$	$R_{G(on)}=2\Omega,$	$T_{vj}=25^\circ\text{C}$		295	ns	
			$T_{vj}=175^\circ\text{C}$		335		
Fall time(inductive load)	t_f	$di/dt=4080\text{A/us}$	$T_{vj}=25^\circ\text{C}$		45	ns	
			$T_{vj}=175^\circ\text{C}$		90		
Turn-on energy	E_{on}	$R_{G(off)}=2\Omega,$	$T_{vj}=25^\circ\text{C}$		3.25	mJ	
			$T_{vj}=175^\circ\text{C}$		5.70		
Turn-off energy	E_{off}	$dv/dt=11300\text{V/us}$	$T_{vj}=25^\circ\text{C}$		3.94	mJ	
			$T_{vj}=175^\circ\text{C}$		6.19		
Total switching energy	E_{ts}	$(\text{感性负载}) /$	$T_{vj}=25^\circ\text{C}$		7.19	mJ	
			$T_{vj}=175^\circ\text{C}$		11.89		
operating junction temperature	T_{vj}		-40		175	$^\circ\text{C}$	

Diode (T_c=25°C, unless otherwise specified.)

Parameter	Symbol	Note or test condition	Values	Unit	
Diode forward current, limited by T _{vjmax}	I _F	limited by bondwire	T _c =25°C	170	A
			T _c =90°C	140	
Diode pulsed current, t _p limited by T _{vjmax}	I _{Fpulse}		560	A	
Power dissipation	P _{tot}		T _c =25°C	625	W
			T _c =100°C	313	

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Diode forward voltage	V _F	I _F =140A	T _{vj} =25°C	2.77	3.5	V
			T _{vj} =175°C	2.49		
Diode reverse recovery time	t _{rr}	I _F =140A, V _R =600V, R _{G(on)} =2Ω, L _s =52nH	T _{vj} =25°C	83		ns
			T _{vj} =175°C	122		
Diode reverse recovery charge	Q _{rr}		T _{vj} =25°C	8.18		μC
			T _{vj} =175°C	15.3		
Diode peak reverse recovery current	I _{rrm}		T _{vj} =25°C	170		A
			T _{vj} =175°C	218		
Reverse recovery energy	E _{rec}		T _{vj} =25°C	4.05		mJ
			T _{vj} =175°C	10.7		
operating junction temperature	T _{vj}		-40		175	°C

Package outlines



SYMBOL	DIMENSIONS			
	mm		inch	
	MIN.	MAX.	MIN.	MAX.
A	4.83	5.21	0.190	0.205
A1	2.29	2.54	0.090	0.100
A2	1.91	2.16	0.075	0.085
b	1.07	1.33	0.042	0.052
b2	2.39	2.94	0.094	0.116
c	0.55	0.68	0.022	0.027
D	23.30	23.60	0.917	0.929
D2	0.95	1.25	0.037	0.049
D3	2.40	2.60	0.094	0.102
E	15.75	16.13	0.620	0.635
E1	3.90	4.10	0.154	0.161
E2	13.05	13.45	0.514	0.530
E3	2.40	3.20	0.094	0.126
e	2.54BSC		0.1BSC	
L	17.31	17.82	0.681	0.702
L1	—	4.37	—	0.172
M	0.40	0.80	0.016	0.032