Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_{D\ (Tc=100℃)}$
1200V	45mΩ@18V	45A

合肥矽普半导体
Siliup Semiconductor Technology Co.Ltd
技术 品质 服务
www.siliup.com

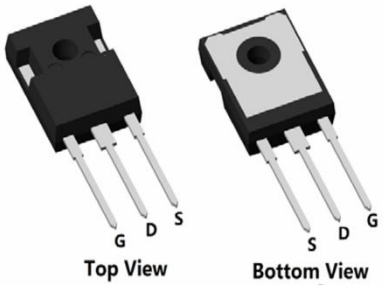
Feature

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low RDS(on)
- Easy to Parallel
- Simple to Drive
- RoHS Compliant
- Wafer level burn in&FT high temperature test
- AECQ-101 Qualified

Applications

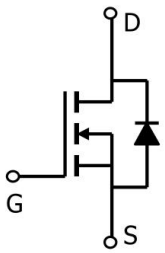
- Power Factor Correction Modules
- Switch Mode Power Supplies
- Photovoltaic Inverter
- UPS Power Supply
- Motor Drive
- High Voltage DC/DC Converter
- Switching Mode Power Supply

Package

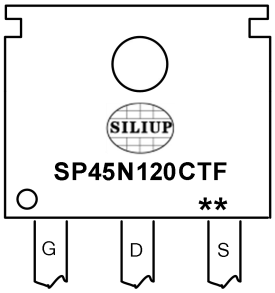


TO-247(1:G 2:D 3:S)

Circuit diagram



Marking



SP45N120CTF : Product code
** : Week code

Order Information

Device	Package	Unit/Tube
SP45N120CTF	TO-247	30

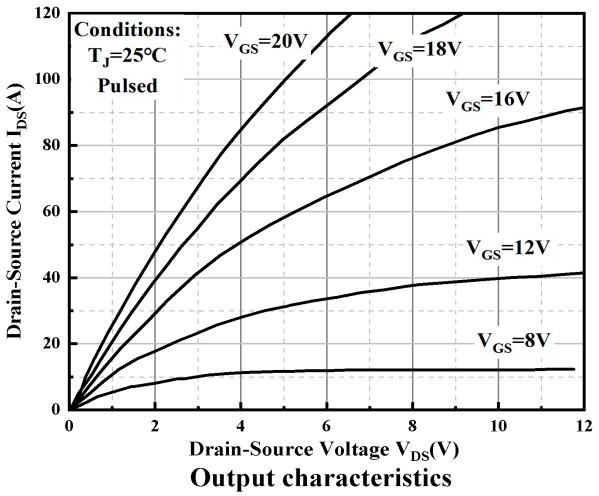
Absolute maximum ratings (Ta=25℃,unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GSMAX}	-10/+22	V
Recommend Gate-Source Voltage	V_{GSop}	-5/+18	V
Continuous Drain Current(Tc=25℃)	I_D	60	A
Continuous Drain Current(Tc=100℃)	I_D	45	A
Pulsed Drain Current	I_{DM}	100	A
Total Power Dissipation(Tc=25℃)	P_D	395	W
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.38	℃/W
Storage Temperature Range	T_{STG}	-55 to 175	℃
Operating Junction Temperature Range	T_J	-55 to 175	℃

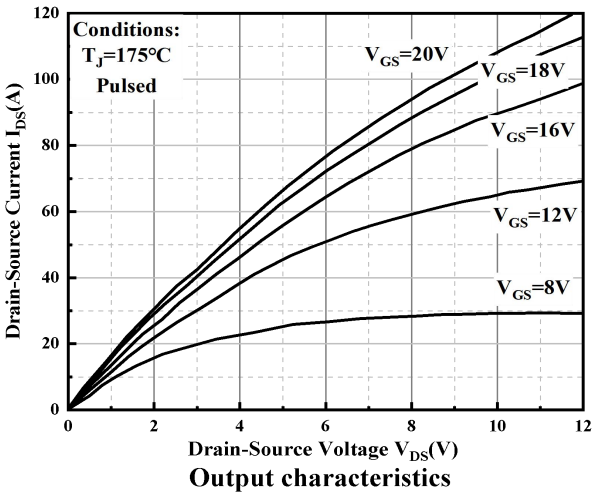
Electrical characteristics (Ta=25℃, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , ID=100uA	1200	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=1200V, V_{GS}=0V, T_J=25℃	-	-	100	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=20V , V_{DS}=0V, T_J=25℃	-	-	250	nA
		V_{GS}=-10V , V_{DS}=0V, T_J=25℃	-	-	250	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =10mA, T_J=25℃	2.0	3.3	4.0	V
		V_{GS}=V_{DS} , I_D =10mA, T_J=175℃	-	2.6	-	
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=18V , I_D=20A, T_J=25℃	-	45	52	mΩ
		V_{GS}=18V , I_D=20A, T_J=175℃	-	81	-	
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS}=1000V , V_{GS}=0V , f=100KHz , V_{AC}=25mV	-	2565	-	pF
Output Capacitance	C_{oss}		-	109	-	
Reverse Transfer Capacitance	C_{rss}		-	4	-	
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}=800V , V_{GS}= -5/+20V , I_D=20A	-	124	-	nC
Gate-Source Charge	Q_{gs}		-	32	-	
Gate-Drain Charge	Q_{gd}		-	33	-	
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=800V , V_{GS}= -5/+20V , I_D=20A R_G=2.5Ω, L=100uH	-	15	-	ns
Rise Time	T_r		-	19	-	
Turn-Off Delay Time	$T_{d(off)}$		-	25	-	
Fall Time	T_f		-	10	-	
Turn-On Energy	E_{on}		-	611	-	μJ
Turn-Off Energy	E_{off}		-	103	-	
Total Switching Loss	E_{tot}		-	714	-	
Reverse Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}= 0V , I_{SD}=20A , T_J=25℃	-	4.2	6.0	V
		V_{GS}= 0V , I_{SD}=20A , T_J=175℃	-	3.5	6.0	
Reverse Recovery Time	t_{rr}	V_{GS}=-5V, I_{SD}=20A, V_R=800V, di/dt=3500A/μs	-	50	-	ns
Reverse Recovery Charge	Q_{rr}		-	712	-	nC
Peak Reverse Recovery Current	I_{rrm}		-	19	-	A
Maximum Body-Diode Continuous Current	I_S	V_{GS}= -4V , T_J=25℃	-	55	-	A

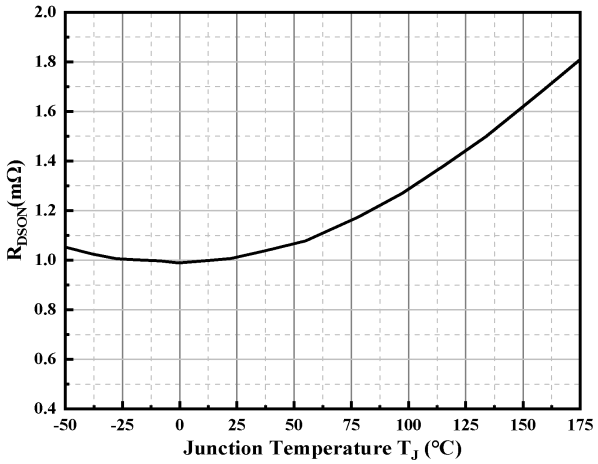
Typical Characteristics



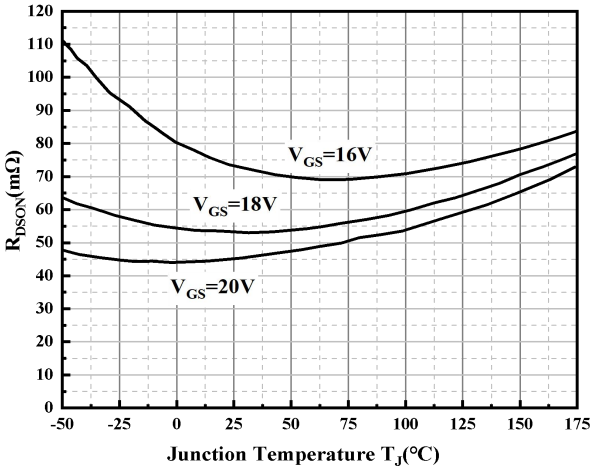
Output characteristics



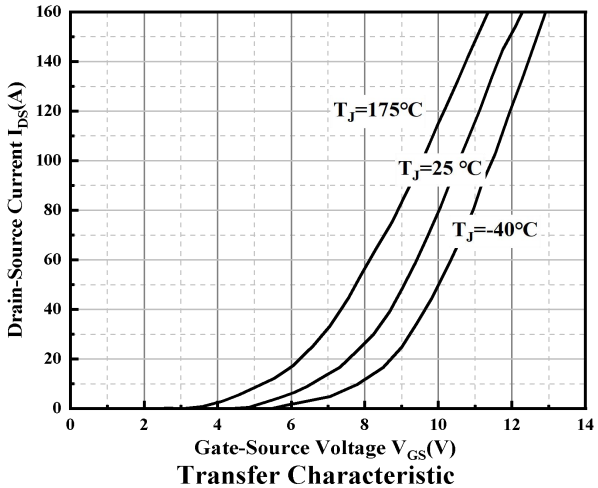
Output characteristics



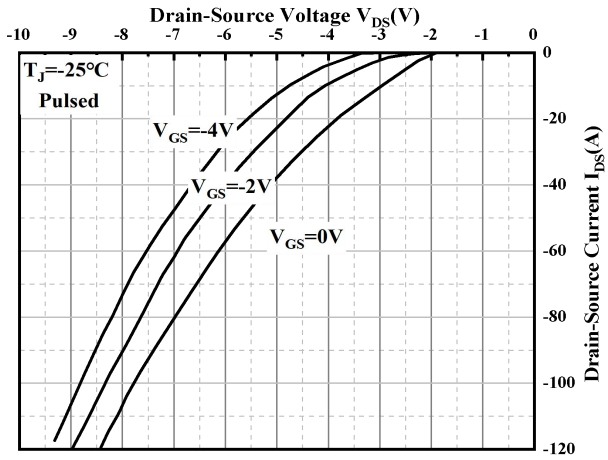
Normalized On-Resistance vs.Temperature



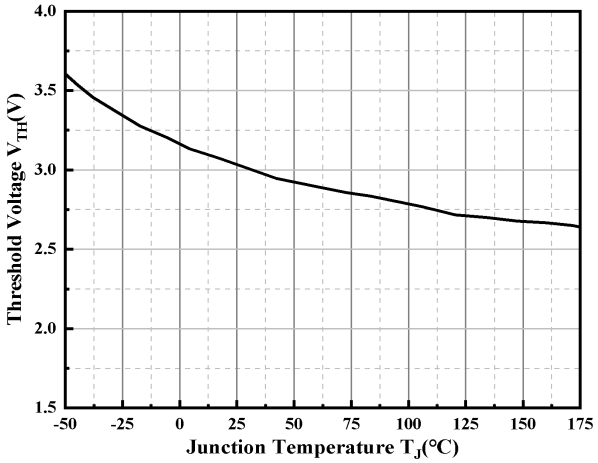
On-Resistance vs.Temperature



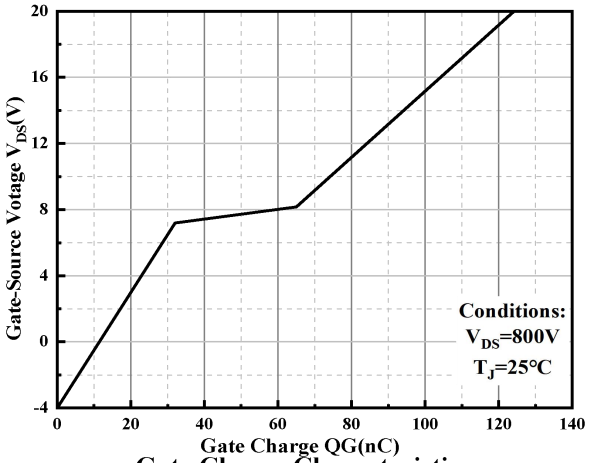
Transfer Characteristic



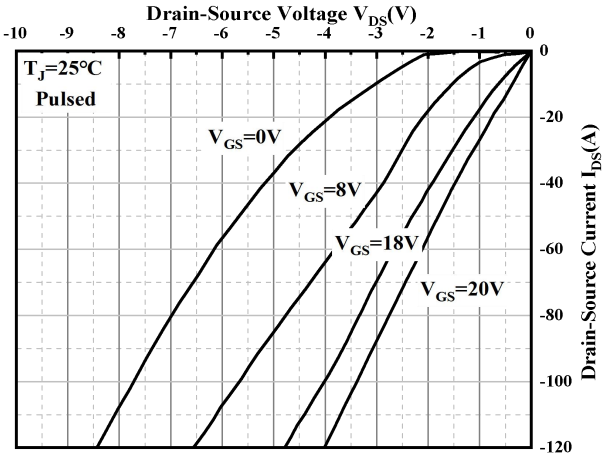
Body Diode Characteristic at 25°C



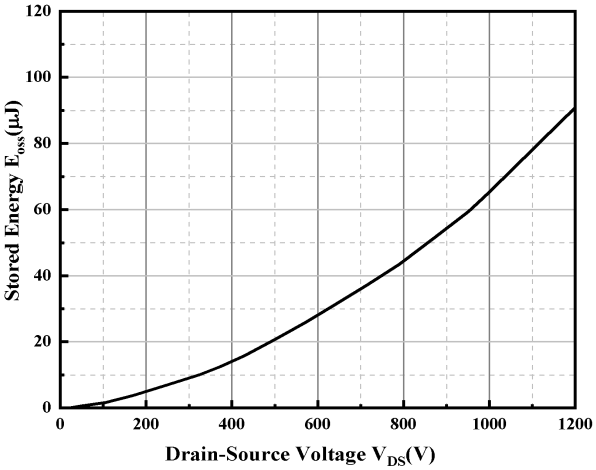
Threshold Voltage vs.Temperature



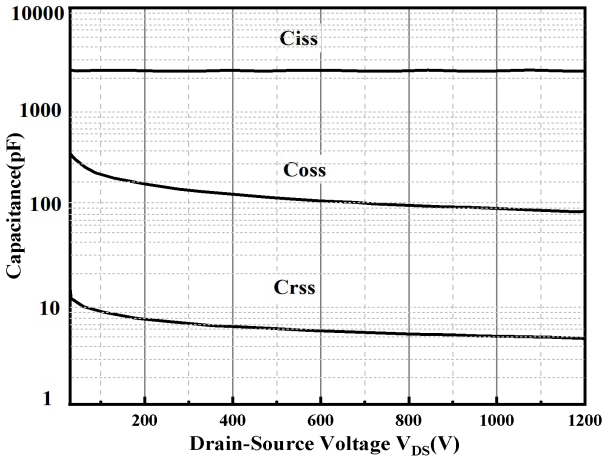
Gate Charge Characteristics



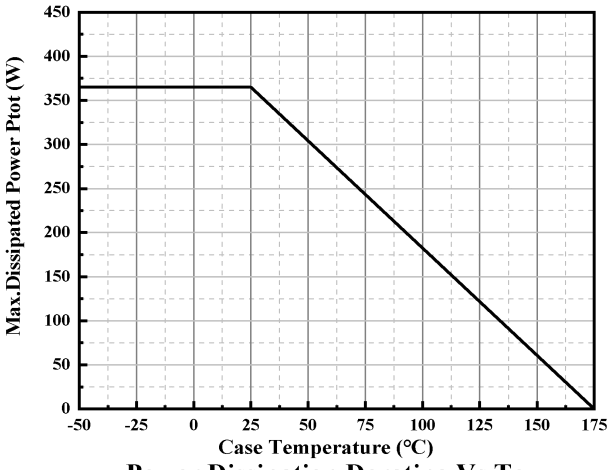
3rd Quadrant Characteristic at 25°C



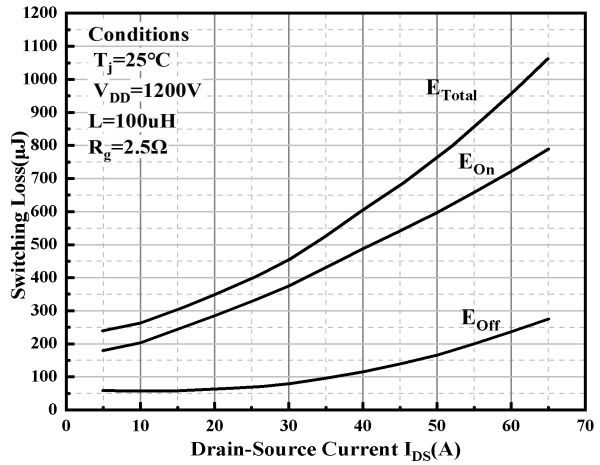
Output Capacitor Stored Energy



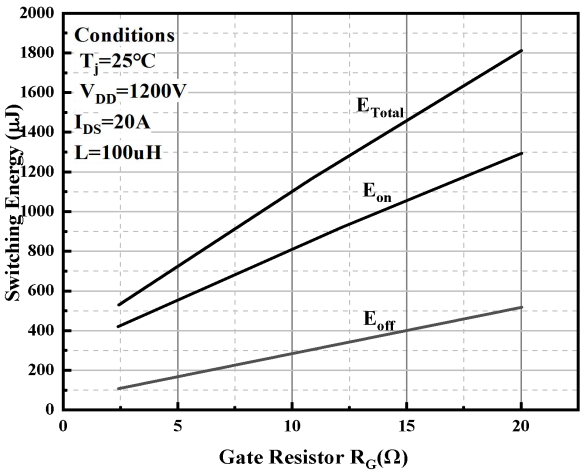
Capacitances vs.Drain-Source



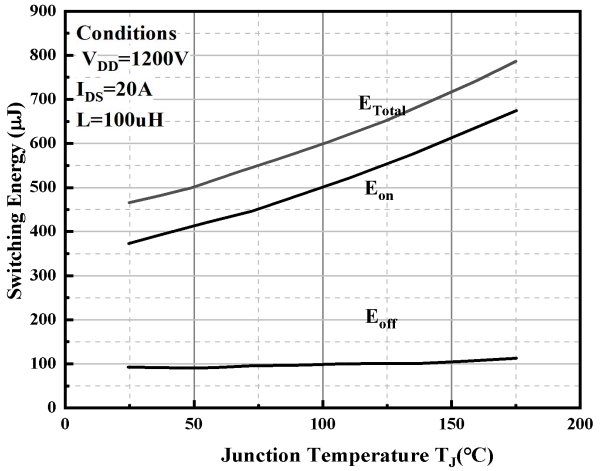
Power Dissipation Derating Vs Tc



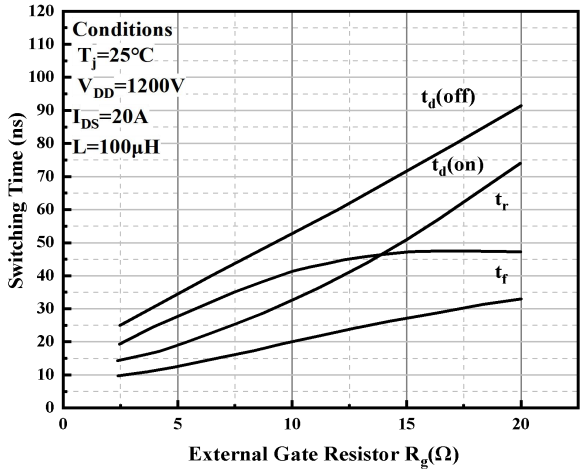
Switching Energy vs.Drain Current



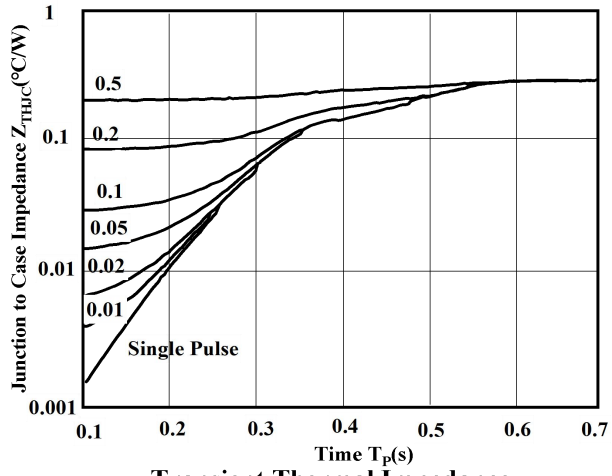
Switching Energy vs.RG(ext)



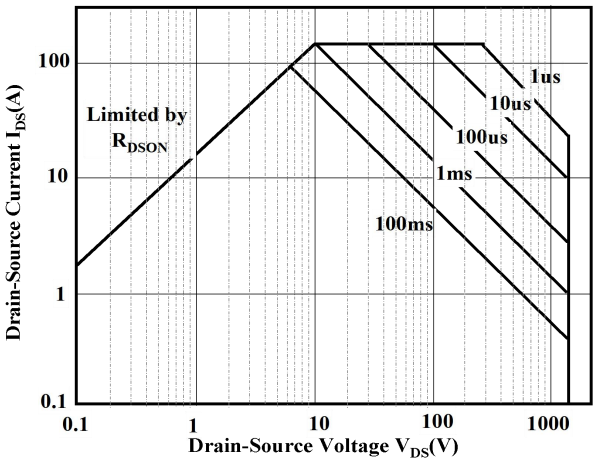
Switching Energy vs.Temperature



Switching Times vs.RG(ext)

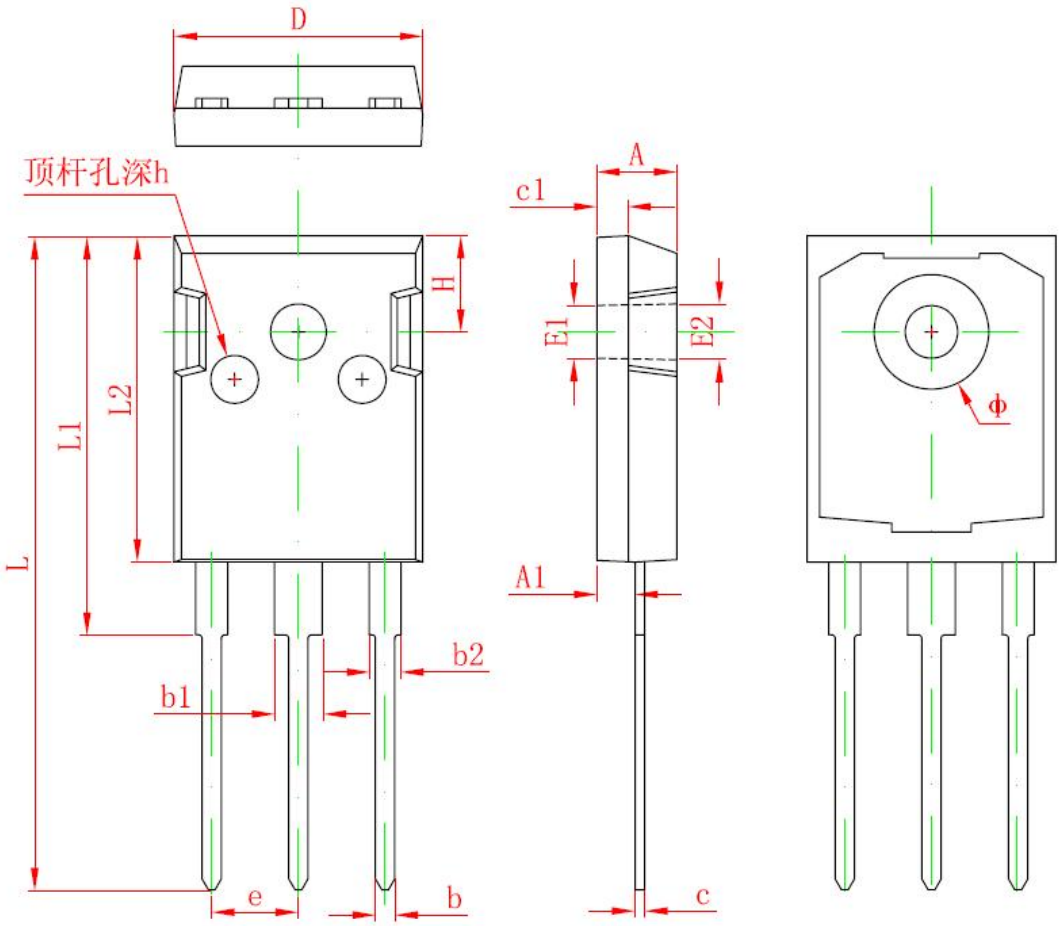


Transient Thermal Impedance



Safe Operating Area

TO-247 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF.		0.138 REF.	
E2	3.600 REF.		0.142 REF.	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP.		0.215 TYP.	
H	5.980 REF.		0.235 REF.	
h	0.000	0.300	0.000	0.012