Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
1200V	32mΩ@18V	52A

合肥矽普半导体
Siliup Semiconductor Technology Co.Ltd
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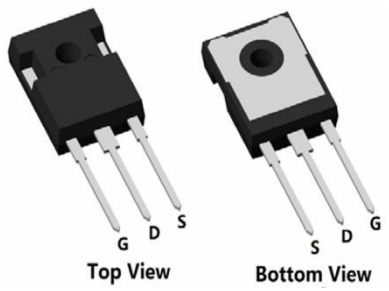
Feature

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low RDS(on)
- Easy to Parallel
- Simple to Drive
- RoHS Compliant

Applications

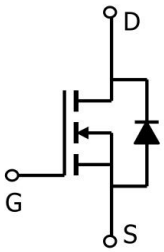
- Power Factor Correction Modules
- Switch Mode Power Supplies
- Photovoltaic Inverter
- UPS Power Supply
- Motor Drive
- High Voltage DC/DC Converter
- Switching Mode Power Supply

Package

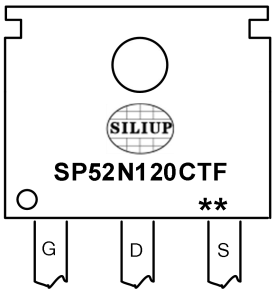


TO-247(1:G 2:D 3:S)

Circuit diagram



Marking



SP52N120CTF : Product code
** : Week code

Order Information

Device	Package	Unit/Tube
SP52N120CTF	TO-247	30

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

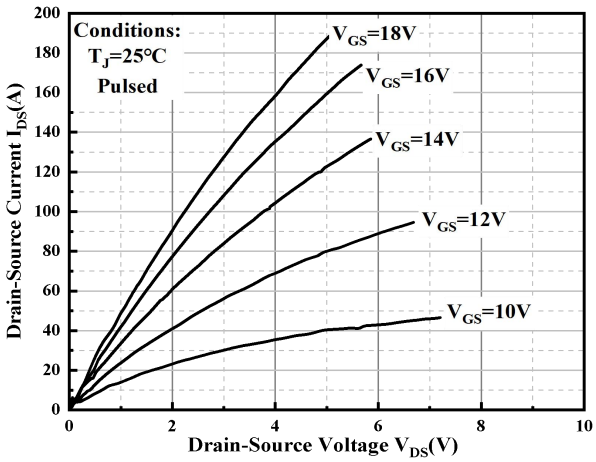
Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GSMAX}	-10/+22	V
Recommend Gate-Source Voltage	V_{GSop}	-5/+18	V
Continuous Drain Current(Tc=25℃)	I_D	78	A
Continuous Drain Current(Tc=100℃)	I_D	52	A
Pulsed Drain Current	I_{DM}	158	A
Single Pulse Avalanche Energy[1]	E_{AS}	1150	mJ
Power Dissipation(Tc=25℃)	P_D	357	W
Power Dissipation(Tc=100℃)	P_D	238	W
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.42	℃/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)

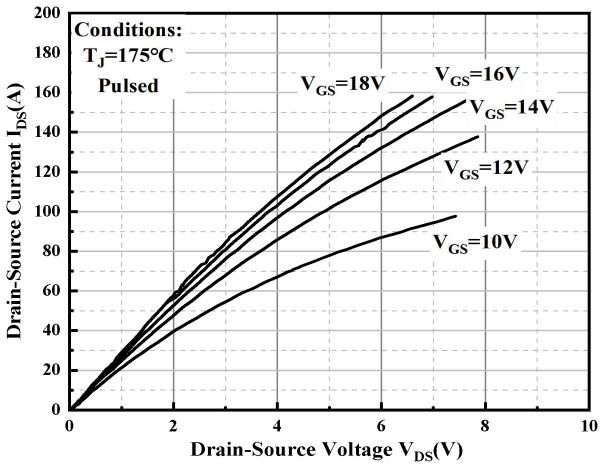
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V , ID=250uA	1200	-	-	V
Drain-Source Leakage Current	I_{DSS}	VDS=1200V, VGS=0V, TJ=25℃	-	1	100	uA
Gate-Source Leakage Current	I_{GSS}	VGS=18V , VDS=0V, TJ=25℃	-	1	100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS , ID =11.5mA, T_j=25℃	2.0	2.8	4.0	V
		VGS=VDS , ID =11.5mA, T_j=175℃	-	2.3	-	
Static Drain-Source On-Resistance	$R_{DS(ON)}$	VGS=18V , ID=40A, T_j=25℃	-	32	40	mΩ
		VGS=18V , ID=40A, T_j=175℃	-	52	-	
Dynamic characteristics						
Input Capacitance	C_{iss}	VDS=1000V , VGS=0V , f=100KHz	-	3177	-	pF
Output Capacitance	C_{oss}		-	142	-	
Reverse Transfer Capacitance	C_{rss}		-	13	-	
Total Gate Charge	Q_g	VDS=800V , VGS= -5/+18V , ID=40A	-	139	-	nC
Gate-Source Charge	Q_{gs}		-	42	-	
Gate-Drain Charge	Q_{gd}		-	47	-	
Switching Characteristics						
Turn-On Delay Time	$T_{d(on)}$	VDS=800V , VGS= -5/+18V , ID=40A RG=4.5Ω	-	18	-	ns
Rise Time	T_r		-	14	-	
Turn-Off Delay Time	$T_{d(off)}$		-	29	-	
Fall Time	T_f		-	10	-	
Turn-On Energy	E_{on}		-	223	-	μJ
Turn-Off Energy	E_{off}		-	90	-	
Total Switching Loss	E_{tot}		-	313	-	
Reverse Diode Characteristics						
Diode Forward Voltage	V_{SD}	VGS= -5V , I_{SD}=20A , T_J=25℃	-	4.7	-	V
		VGS= -5V , I_{SD}=20A , T_J=175℃	-	4.2	-	
Reverse Recovery Time	t_{rr}	VGS=-5V/+18V, I_{SD}=70A, V_R=800V, di/dt=1000A/μs	-	23	-	ns
Reverse Recovery Charge	Q_{rr}		-	696	-	nC
Peak Reverse Recovery Current	I_{rrm}		-	43	-	A

Note :
The test condition is VDD=50V,VGS=10V,L=0.5mH,RG=25Ω

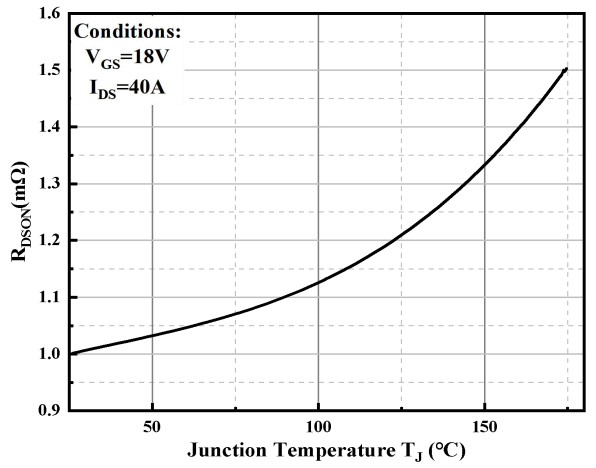
Typical Characteristics



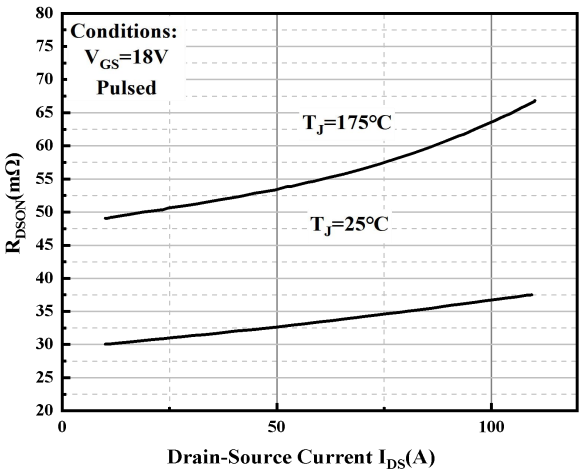
Typical output characteristic(25℃)



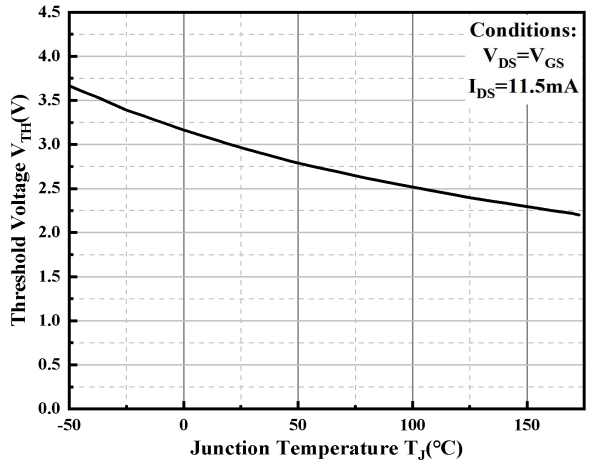
Typical output characteristic(175℃)



Normalized On−Resistance with Temperature



On−Resistance vs. Drain-Source Current



Threshold Voltage Variation with Temperature

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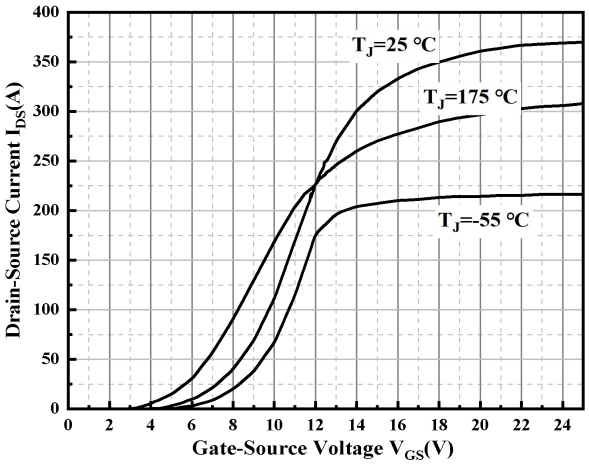
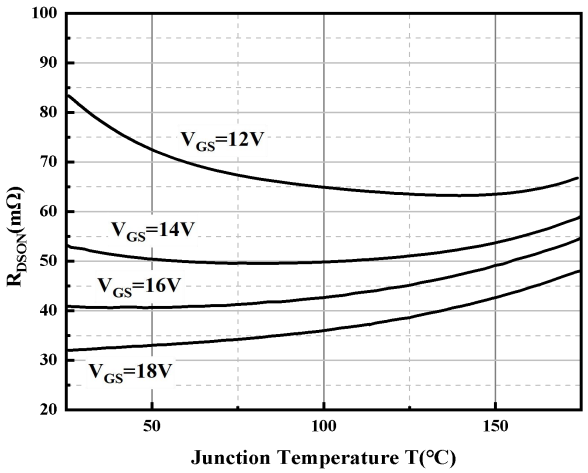
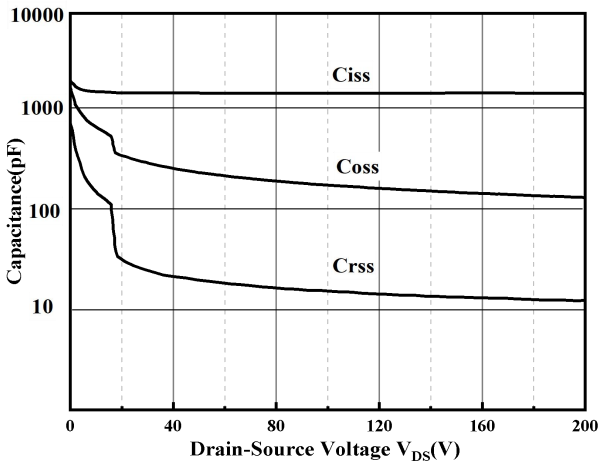


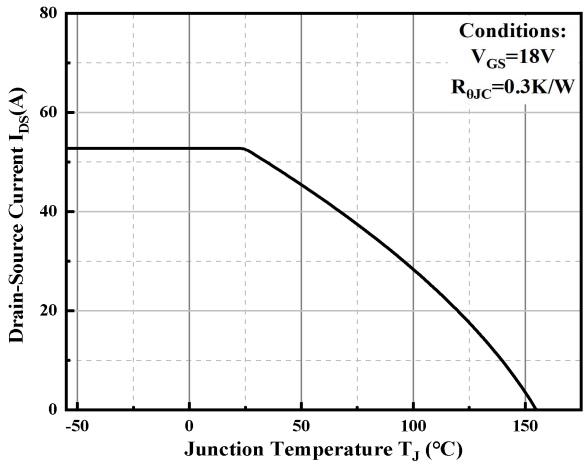
Transfer Characteristics



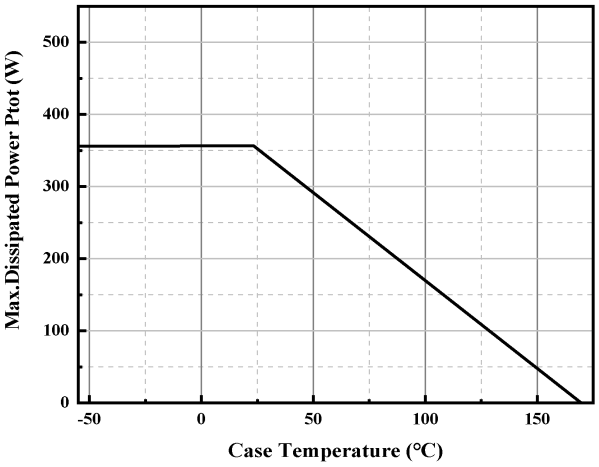
On−Resistance Variation with Temperature



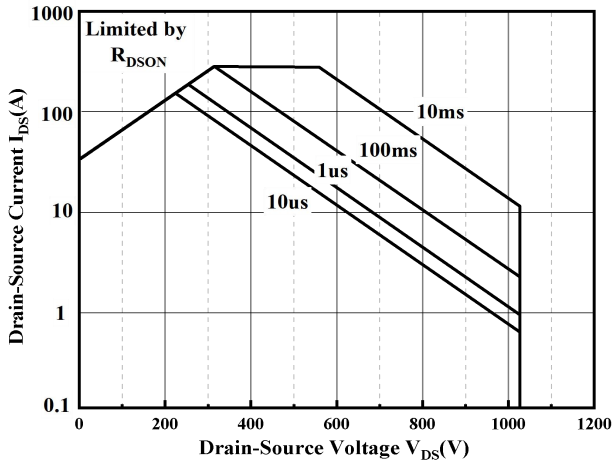
Capacitance vs. Drain−to−Source Voltage



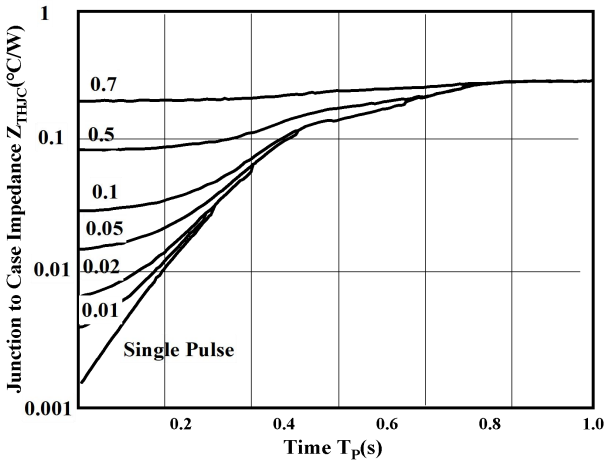
. Maximum Ids vs. Case Temperature



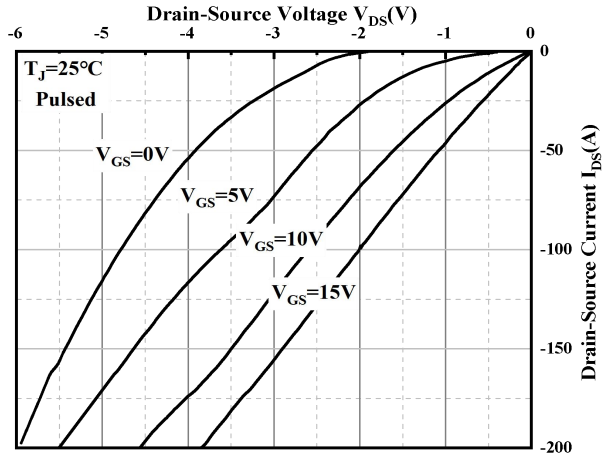
Power dissipation vs. Case temperature



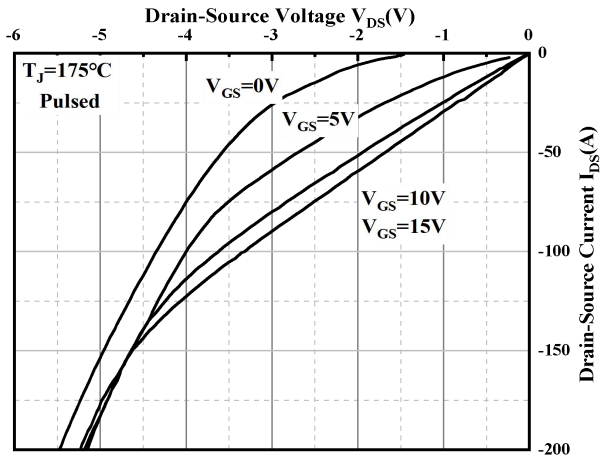
Safe Operation Area



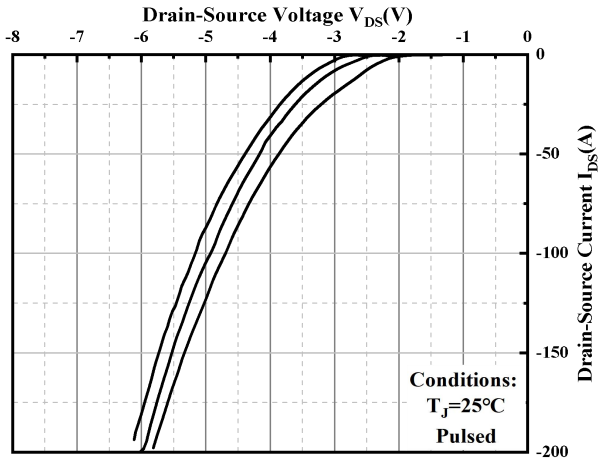
Transient Thermal Impedance

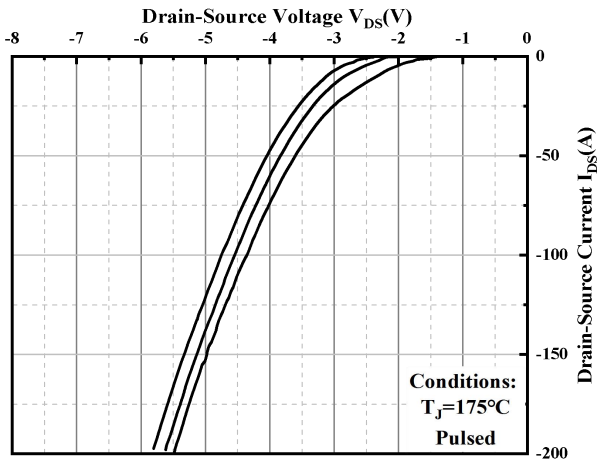


Drain-Source Current vs Drain-Source Voltage(25℃)

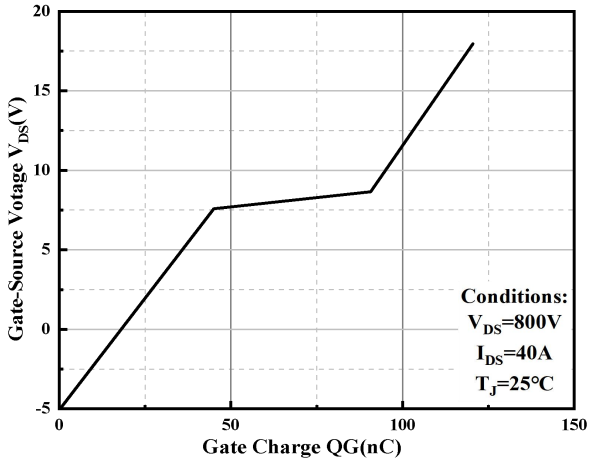


Drain-Source Current vs Drain-Source Voltage(175℃)



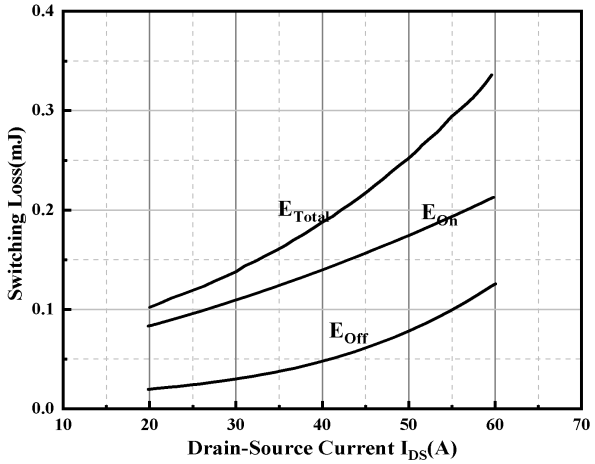


Body Diode Characteristic(25℃)



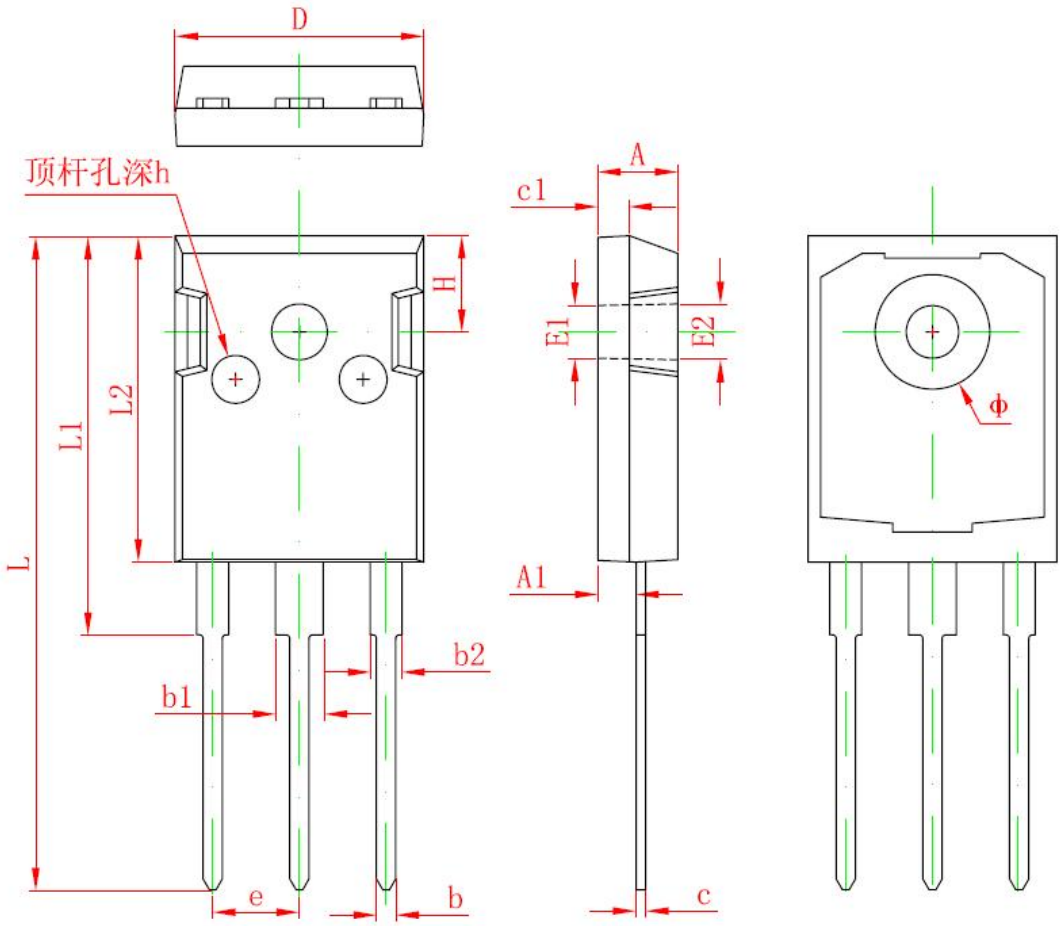
Gate Charge Characteristics

Body Diode Characteristic(175℃)



Switching Energy

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