JIANGSU CHANGJING ELECTRONICS TECHNOLOGY CO., LTD.

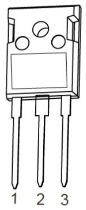
TO-247-A Plastic-Encapsulate MOSFET

CJWT011SN20MK N-Channel Power MOSFET

Key Performance Parameters

$V_{BR(DSS)}$	$R_{DS(on)}$TYP	I_D
200V	**8.6mΩ@10V**	**135A**

TO-247-A



1.GATE
2.DRAIN
3.SOURCE

DESCRIPTION

The N-Channel enhancement mode power field effect transistors is using SGT technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.These devices are well suited for high efficiency fast switching applications.

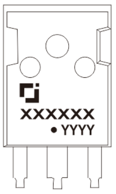
FEATURES

- 100% Avalanche tested
- Low drain-source on-resistance
- Low gate charge
- High current capability

APPLICATIONS

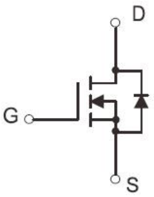
- DC/DC
- Switching application

MARKING



XXXXXX = 011SN20MK
Solid dot = Green molding compound device.
YYYY = Code.

EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS (T_J=25℃ unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C =25℃	I_D	135	A
	T_C =100℃		85	
Pulsed Drain Current		I_{DM}①②	540	A
Continuous Drain Current	T_A =25℃	I_D	10.4	A
	T_A =75℃		8.1	
Avalanche Current		I_{AS}③	38	A
Single Pulsed Avalanche Energy		E_{AS}③	361	mJ
Power Dissipation		P_D①	500	W
Operating Junction and Storage Temperature Range		T_J,T_{stg}	-55~+150	℃

Thermal Characteristics

Parameter	Symbol	Value		Unit
		Typ	Max	
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.17	0.25	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$⑥	30	45	℃/W

Typical Characteristics

ELECTRICAL CHARACTERISTICS (T_J=25℃ unless otherwise specified)

Static Characteristics

Parameter	Symbol	Test Condition		Value			Unit
				Min	Typ	Max	
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA		200	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=200V, V_{GS}=0V	T_J=25℃	-	-	1.0	μA
			T_J=125℃	-	-	100	
Gate-body leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V		-	-	±100	nA
Gate-threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA		2.0	3.0	4.0	V
Static drain-source on-sate resistance	$R_{DS(on)}$④	V_{GS}=10V, I_D=20A	T_J=25℃	-	8.6	11.0	mΩ
			T_J=125℃	-	17.6	22.6	
Forward transconductance	g_{FS}	V_{DS}=5V, I_D=20A		-	80	-	S

Dynamic Characteristics⑤

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=100V, f=100kHz	-	5588	-	pF
Output capacitance	C_{oss}		-	418	-	
Reverse transfer capacitance	C_{rss}		-	11	-	
Gate resistance	R_g	f=1MHz	-	2.6	-	Ω
Total gate charge	Q_g	V_{GS}=10V, V_{DS}=100V, I_D=20A	-	72.2	-	nC
Gate charge at threshold	$Q_{G(th)}$		-	15.9	-	
Gate-source charge	Q_{gs}		-	22.8	-	
Gate-drain charge	Q_{gd}		-	10.5	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=100V, V_{GS}=10V, I_D=20A, R_g=10Ω	-	45	-	ns
Turn-on rise time	t_r		-	41	-	
Turn-off delay time	$t_{d(off)}$		-	106	-	
Turn-off fall time	t_f		-	50	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Drain-source diode forward voltage	V_{SD}④	V_{GS}=0V, I_S=20A	-	-	1.2	V
Continuous drain-source diode forward current	I_S①		-	-	135	A
Pulsed drain-source diode forward current	I_{SM}①②		-	-	540	A
Reverse recovery time	t_{rr}	V_{DD}=100V, I_S=20A, di/dt=100A/μs	-	132	-	ns
Reverse recovery charge	Q_{rr}		-	698	-	nC

Notes:

①.T_C=25℃ Limited only by maximum temperature allowed.

②.P_W ≤10μs, Duty cycle ≤1%.

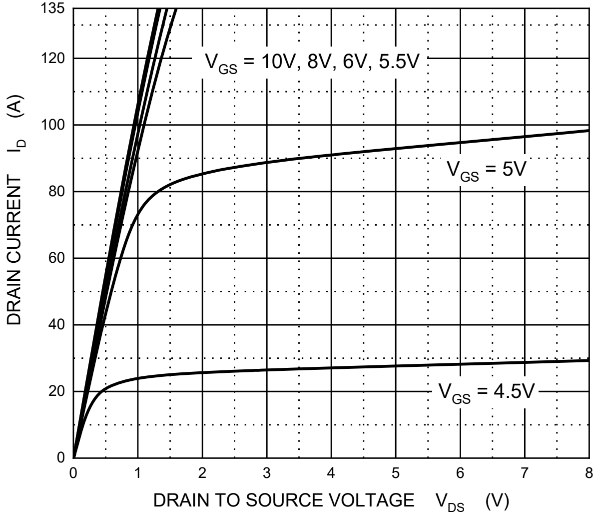
③.EAS condition: V_{DD}=100V, V_{GS}=10V, L=0.5mH, R_g=25Ω Starting T_J=25℃.

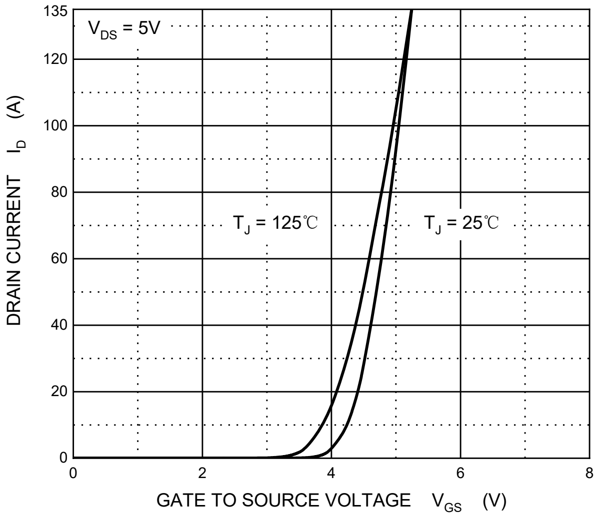
④.Pulse Test : Pulse Width ≤380μs, duty cycle ≤2%.

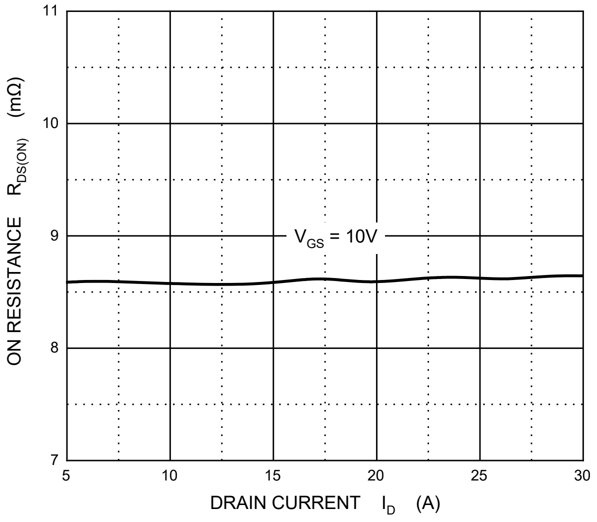
⑤.Guaranteed by design, not subject to production.

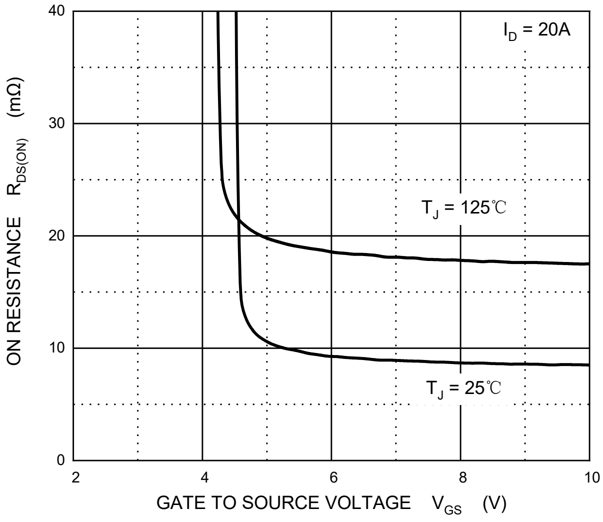
⑥.Device mounted in a still air environment with T_A=25℃.

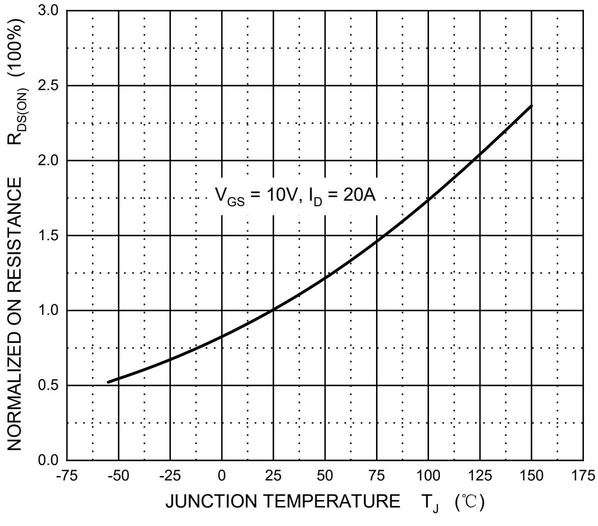
Typical Characteristics

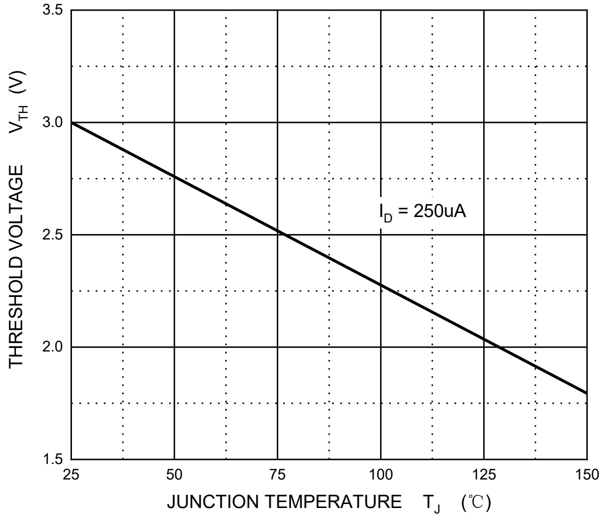

Output Characteristics


Transfer Characteristics

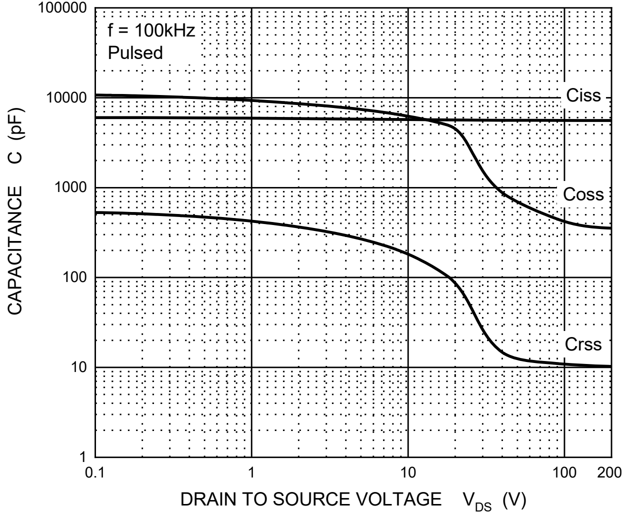

On Resistance vs. Drain Current

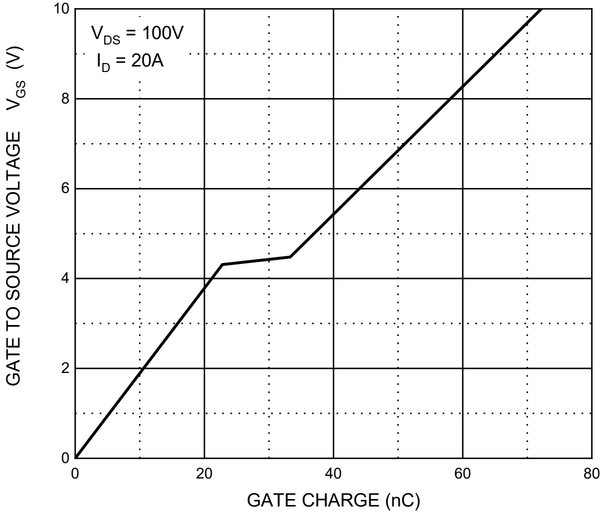

On Resistance vs. Gate-Source Bias

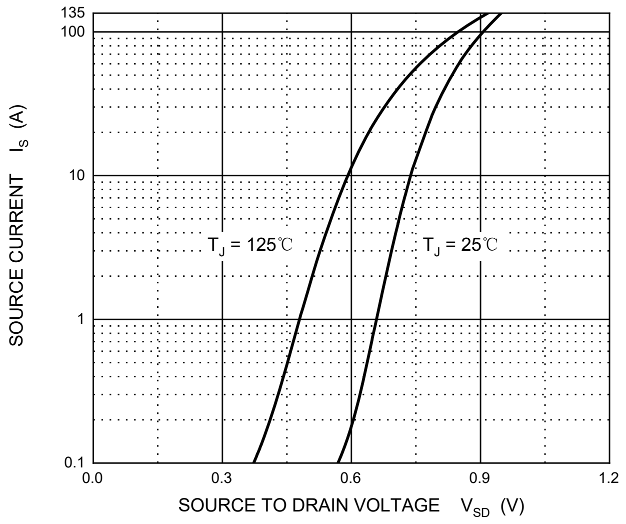

On Resistance vs. Junction Temperature

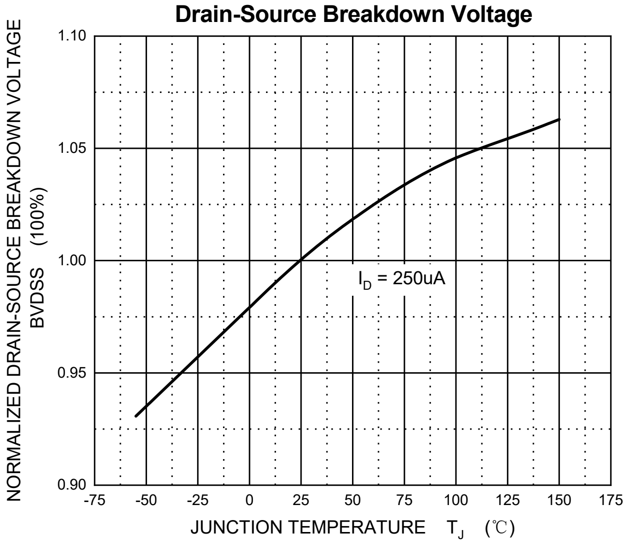

Gate-Source Threshold Voltage

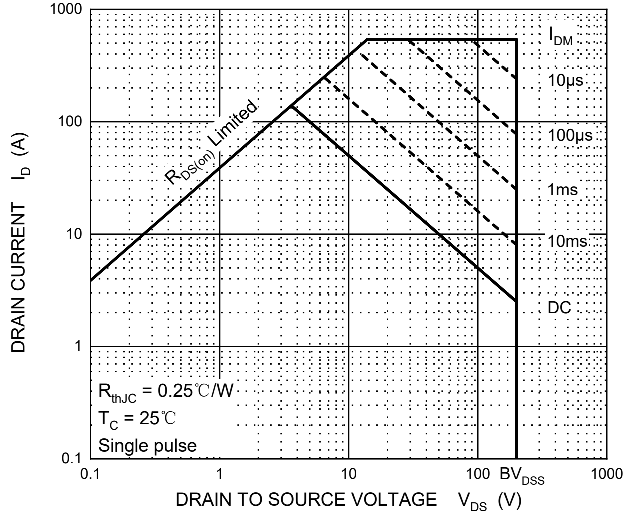
Typical Characteristics

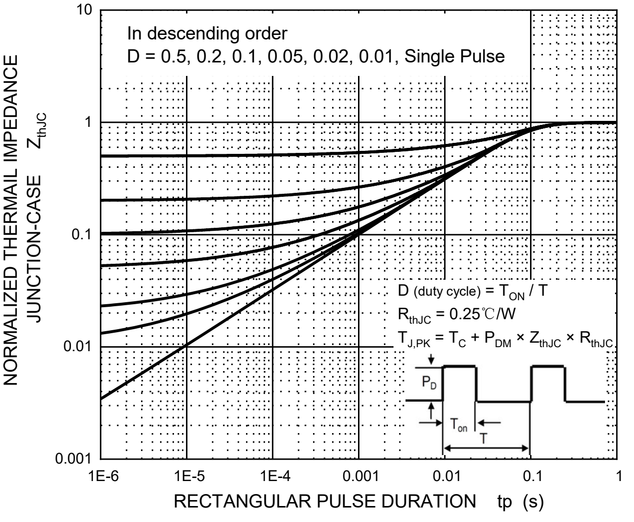

Typical Capacitances


Gate Charge


Source-Drain Diode Forward Characteristics

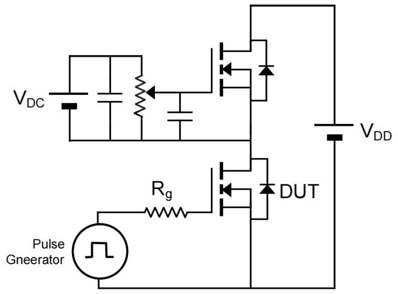

Drain-Source Breakdown Voltage

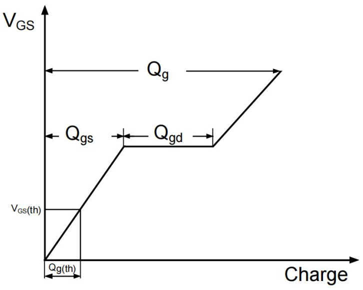

Maximum Safe Operating Area


Transient Thermal Impedance, Junction-Case

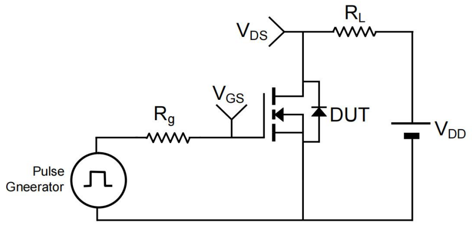
Test Circuit And Waveforms

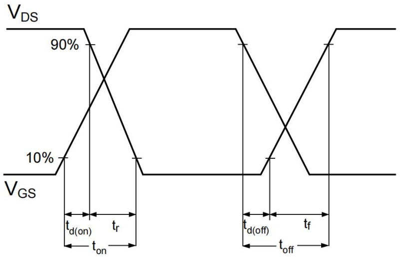
Gate Charge



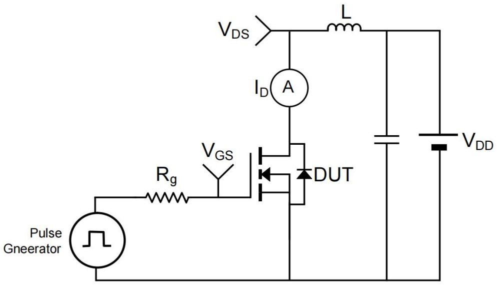


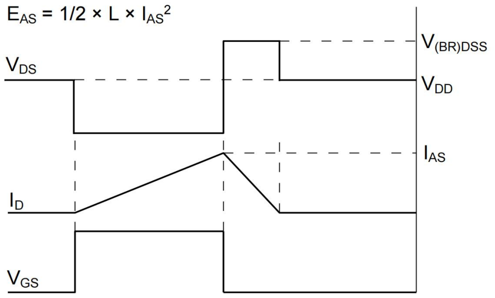
Resistive Load Switching Time



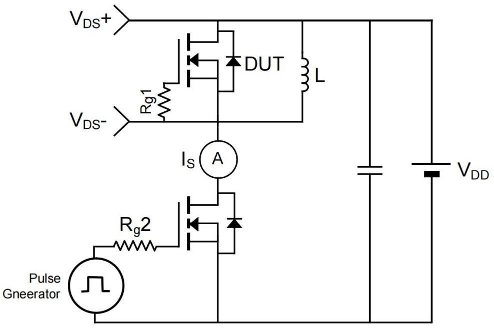


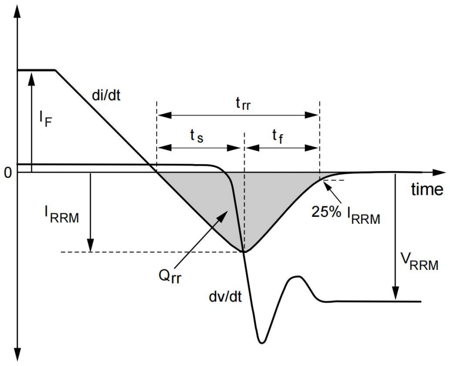
Un-clamped Inductive Load Switching



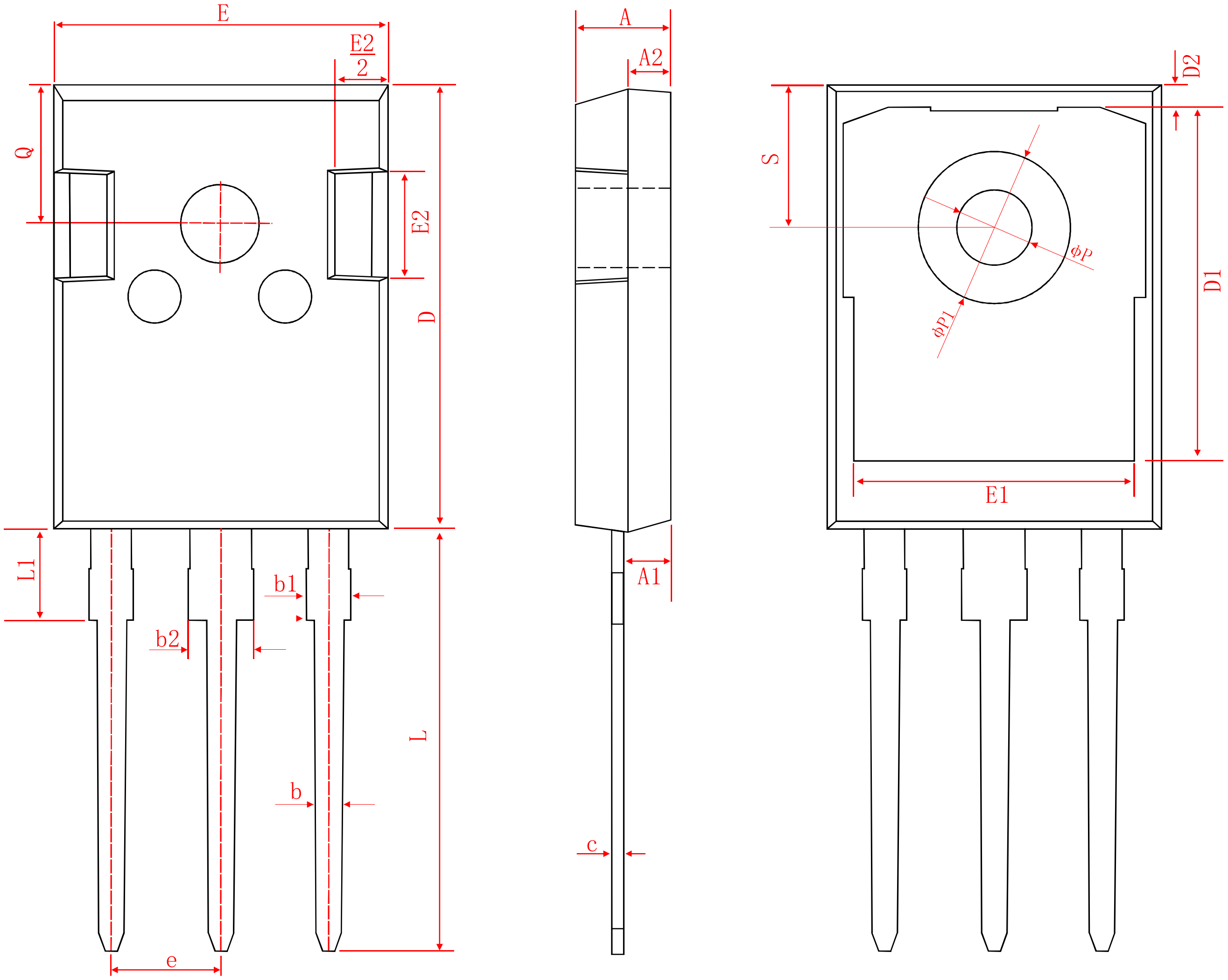


Drain-Source Body Diode Reverse Recovery





TO-247-A Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.90	5.10	0.193	0.201
A1	2.31	2.51	0.091	0.099
A2	1.90	2.10	0.075	0.083
b	1.15	1.25	0.045	0.049
b1	1.95	2.25	0.077	0.089
b2	2.95	3.25	0.116	0.128
c	0.55	0.65	0.022	0.026
D	20.90	21.10	0.823	0.831
D1	16.35	16.75	0.644	0.659
D2	1.05	1.35	0.041	0.053
e	5.44 TYP.		0.214 TYP.	
E	15.70	15.90	0.618	0.626
E1	13.10	13.40	0.516	0.528
E2	4.90	5.10	0.193	0.201
Q	5.60	6.00	0.220	0.236
S	6.05	6.25	0.238	0.246
L	19.80	20.15	0.780	0.793
L1		4.30		0.169
ΦP	3.45	3.65	0.136	0.144
ΦP1	7.03	7.33	0.277	0.289