Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
1200V	15mΩ@18V	90A

Feature

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

Applications

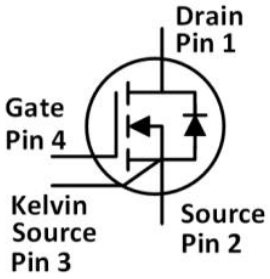
- Power Factor Correction Modules
- Switch Mode Power Supplies
- Photovoltaic Inverter
- UPS Power Supply
- Motor Drive
- High Voltage DC/DC Converter
- Switching Mode Power Supply

Package

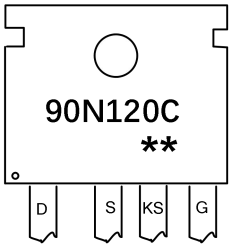
TO-247-4L

(1-Drain; 2-Source; 3Kelvin Source;4-Gate)

Circuit diagram



Marking



90N120C **=Device Code**
****** **=Week Code**

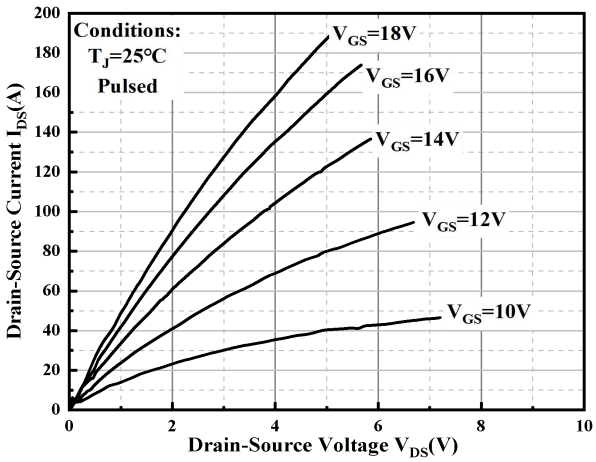
Absolute maximum ratings (Ta=25℃,unless otherwise noted)

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	135	A
Continuous Drain Current(Tc=100℃)	I_D	90	A
Pulsed Drain Current	I_{DM}	270	A
Total Power Dissipation(Tc=25℃)	P_D	503	W
Total Power Dissipation[2](Tc=100℃)	P_D	256	W
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.3	℃/W
Storage Temperature Range	T_{STG}	-55 to 175	℃
Operating Junction Temperature Range	T_J	-55 to 175	℃

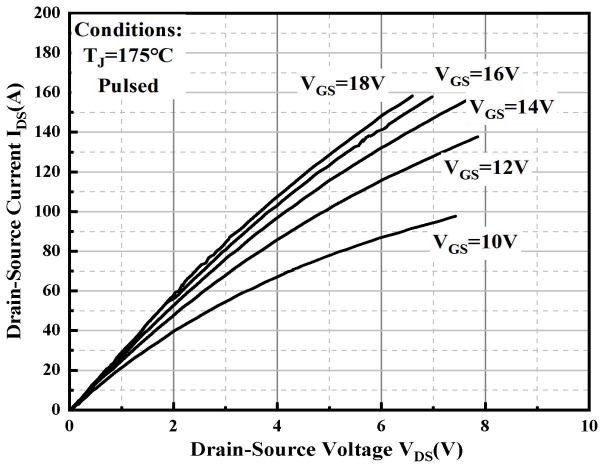
Electrical characteristics (Ta=25℃, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V , ID=100uA	1200	---	---	V
Drain-Source Leakage Current	I_{DSS}	VDS=1200V, VGS=0V, TJ=25℃	---	1	50	uA
Gate-Source Leakage Current	I_{GSS}	VGS=-10/+22 , VDS=0V, TJ=25℃	---	---	200	nA
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS , ID =23mA, T_j=25℃	2.0	2.5	4.0	V
		VGS=VDS , ID =23mA, T_j=175℃	---	1.8	---	
Static Drain-Source On-Resistance	$R_{DS(ON)}$	VGS=18V , ID=75A, T_j=25℃	---	15	19	mΩ
		VGS=18V , ID=75A, T_j=175℃	---	25	---	
Dynamic characteristics						
Input Capacitance	C_{iss}	VDS=800V , VGS=0V , f=1MHz	---	4760	---	pF
Output Capacitance	C_{oss}		---	243	---	
Reverse Transfer Capacitance	C_{rss}		---	8	---	
Switching Characteristics						
Total Gate Charge (4.5V)	Q_g	VDS=800V , VGS= -5/+18V , ID=75A	---	210	---	nC
Gate-Source Charge	Q_{gs}		---	89	---	
Gate-Drain Charge	Q_{gd}		---	22	---	
Turn-On Delay Time	$T_{d(on)}$	VDS=800V , VGS= -5/+18V , ID=75A RG=4.5Ω	---	33	---	ns
Rise Time	T_r		---	36	---	
Turn-Off Delay Time	$T_{d(off)}$		---	77	---	
Fall Time	T_f		---	22	---	
Turn-On Energy	E_{on}		---	2.24	---	mJ
Turn-Off Energy	E_{off}		---	0.31	---	
Total Switching Loss	E_{tot}		---	2.55	---	
Reverse Diode Characteristics						
Diode Forward Voltage	V_{SD}	VGS= -5V , I_{SD}=37.5A , T_J=25℃	---	4.0	---	V
		VGS= -5V , I_{SD}=37.5A , T_J=175℃	---	3.5	---	
Reverse Recovery Time	trr	VGS=-5V/+18V, I_{SD}=75A, V_R=800V, di/dt=1000A/μs	---	39.4	---	ns
Reverse Recovery Charge	Qrr		---	370	---	nC
Peak Reverse Recovery Current	Irrm		---	16.4	---	A
Reverse Recovery Energy	Erec			42.6		μJ

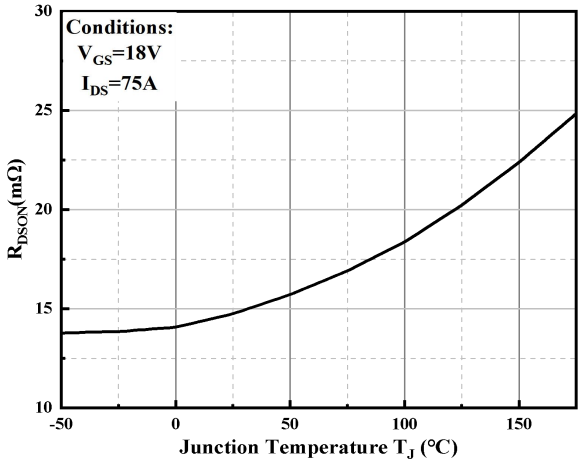
Typical Characteristics



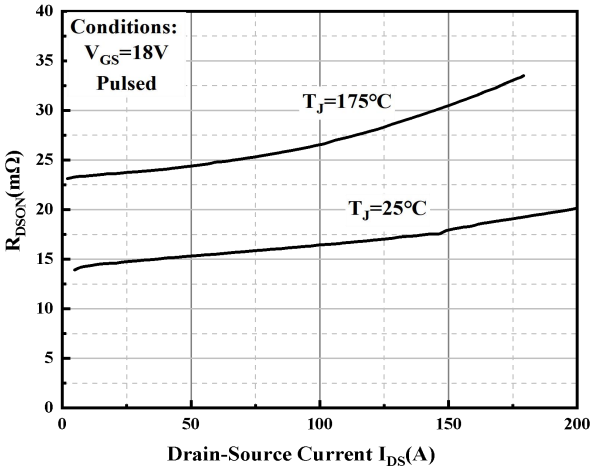
Typical output characteristic(25℃）



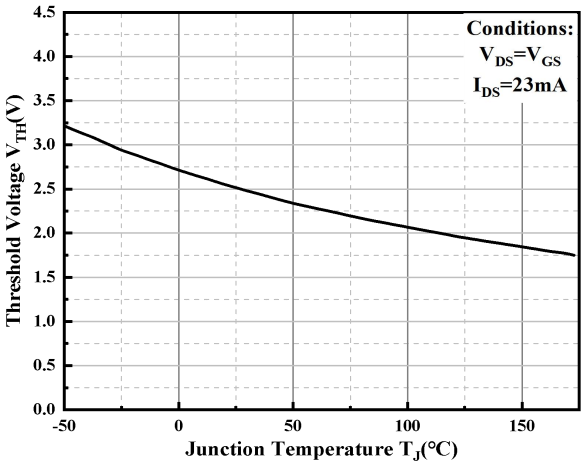
Typical output characteristic(175℃）



Normalized On−Resistance with Temperature



On−Resistance vs. Drain-Source Current



Threshold Voltage Variation with Temperature

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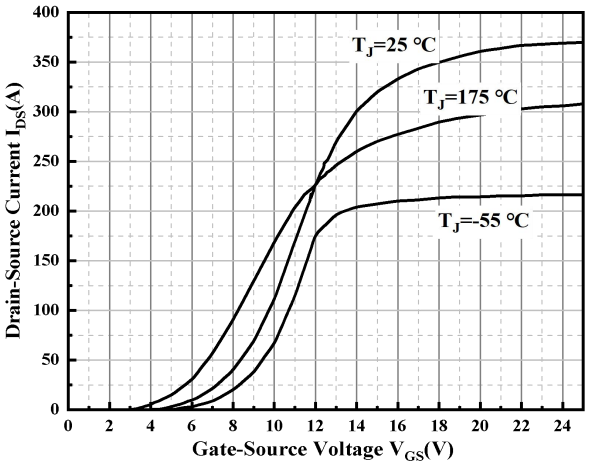
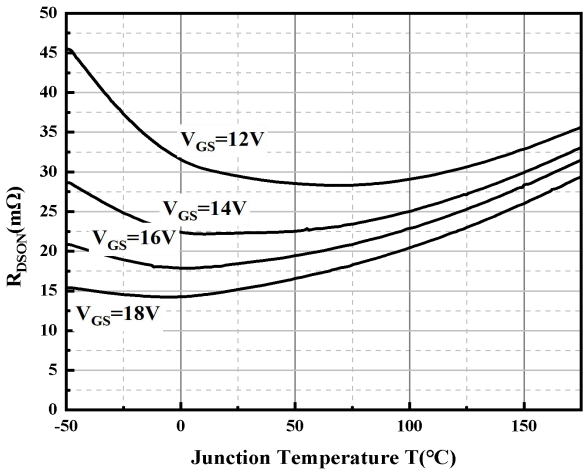
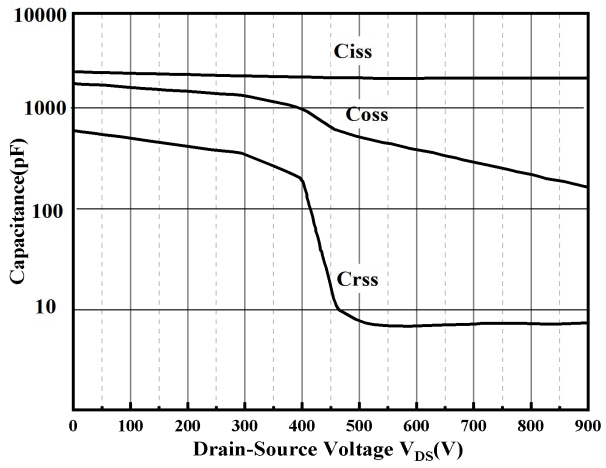


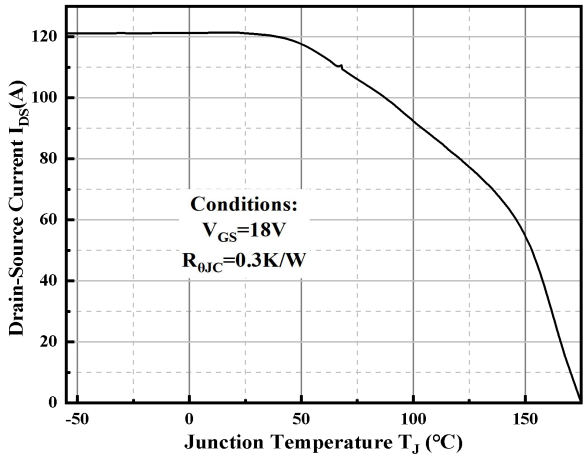
Transfer Characteristics



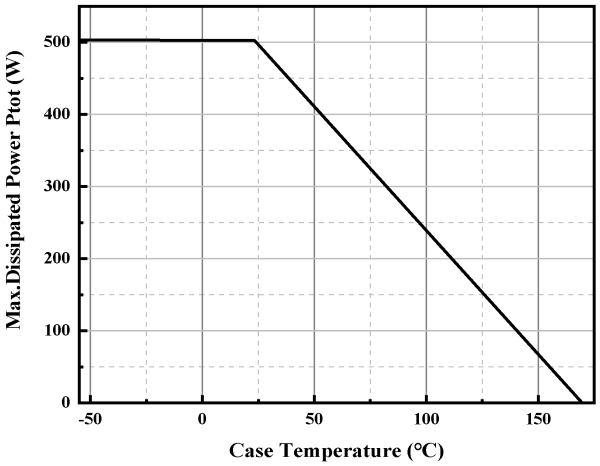
On−Resistance Variation with Temperature



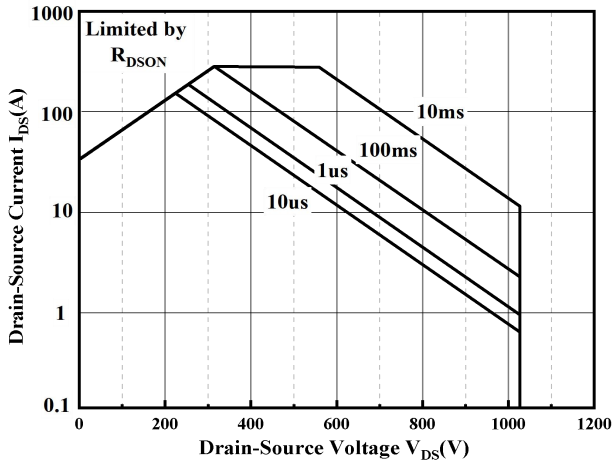
Capacitance vs. Drain−to−Source Voltage



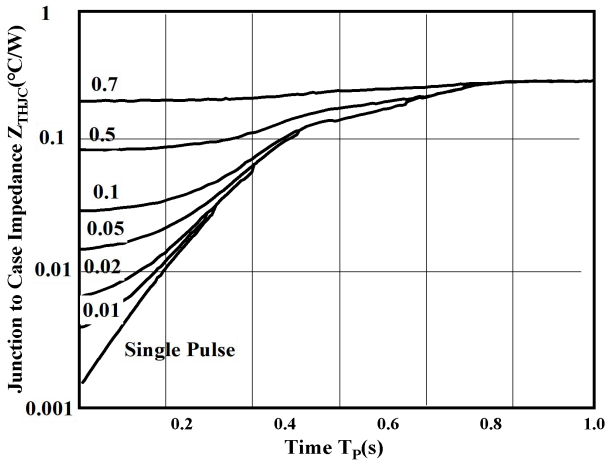
. Maximum Ids vs. Case Temperature



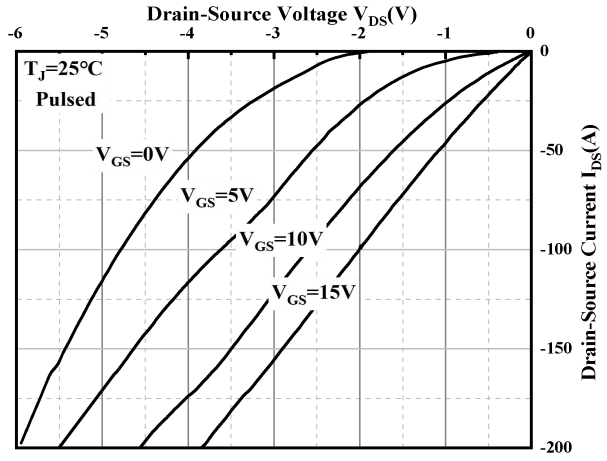
Power dissipation vs. Case temperature



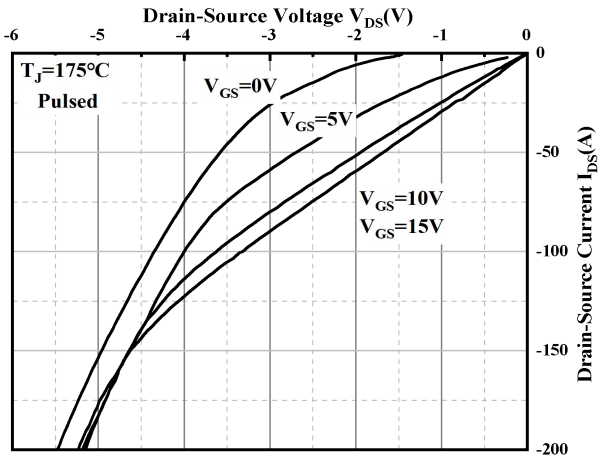
Safe Operation Area



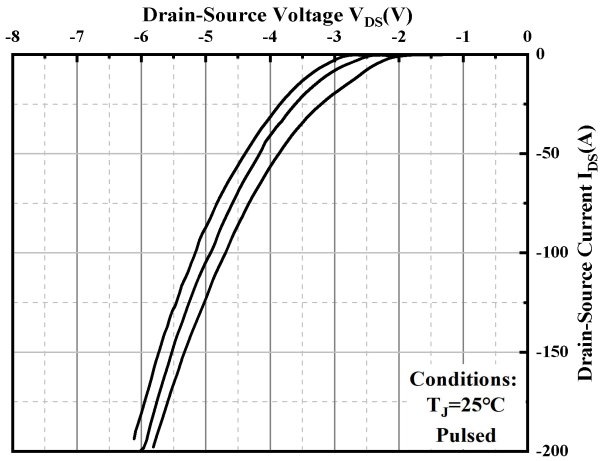
Transient Thermal Impedance



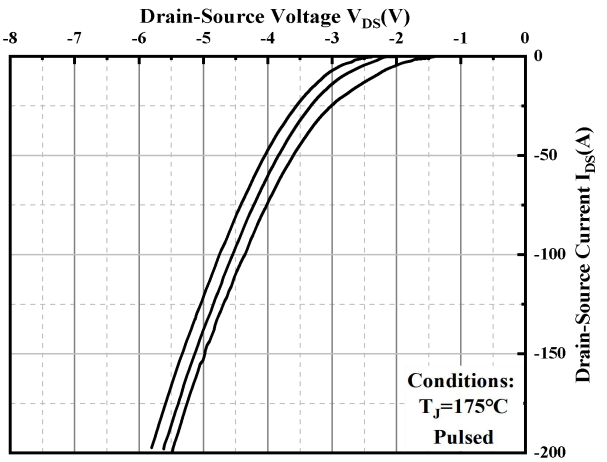
Drain-Source Current vs Drain-Source Voltage(25℃)



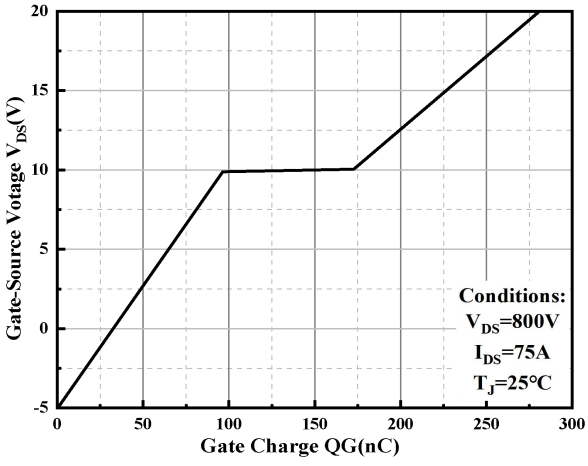
Drain-Source Current vs Drain-Source Voltage(175℃)



Body Diode Characteristic(25℃)

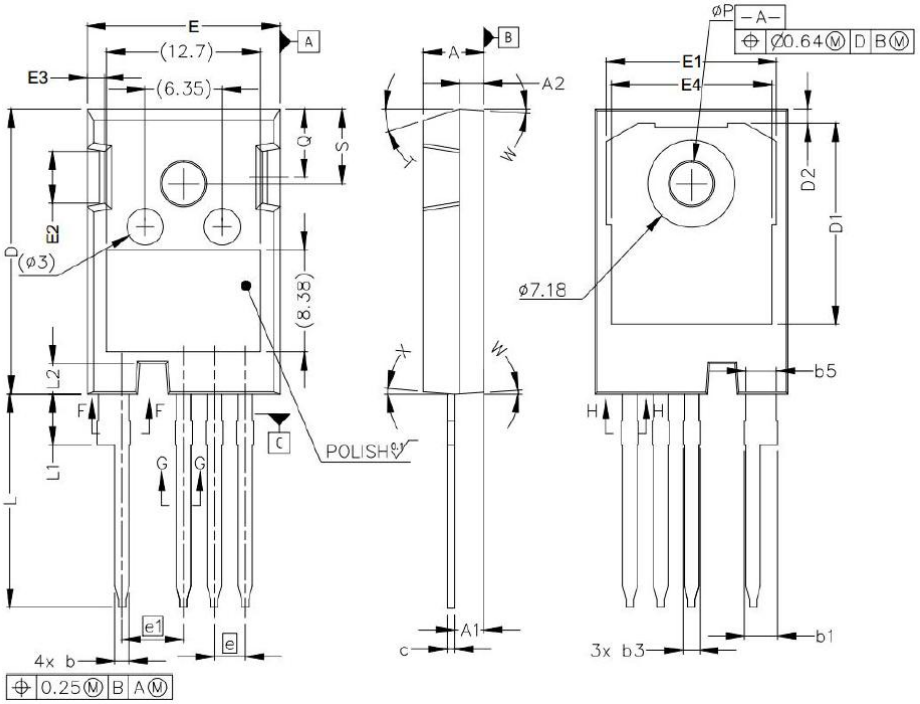


Body Diode Characteristic(175℃)



Gate Charge Characteristics

TO-247-4L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	0.19	0.21
A1	2.29	2.54	0.09	0.10
A2	1.91	2.16	0.08	0.09
b1	2.39	2.94	0.09	0.12
b3	1.07	1.60	0.04	0.06
b5	2.39	2.69	0.09	0.11
c	0.55	0.68	0.02	0.03
D	23.30	23.60	0.92	0.93
D1	16.25	17.65	0.64	0.69
D2	0.95	1.25	0.04	0.05
E	15.75	16.13	0.62	0.64
E1	13.10	14.15	0.52	0.56
E2	3.68	5.10	0.14	0.20
E3	1.00	1.90	0.04	0.07
E4	12.38	13.43	0.49	0.53
e	2.54 BSC		0.1 BSC	
e1	5.08 BSC		0.2 BSC	
L	17.31	17.82	0.68	0.70
L1	3.97	4.37	0.16	0.17
L2	2.35	2.65	0.09	0.10
ΦP	3.51	3.65	0.14	0.14
Q	5.49	6.00	0.22	0.24
S	6.04	6.30	0.24	0.25
T	17.5° REF.		0.69° REF.	
W	3.5° REF.		0.14° REF.	
X	4.0° REF.		0.16° REF.	

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