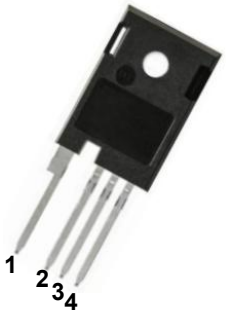
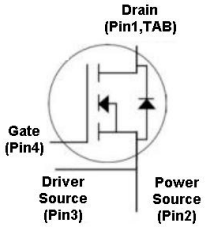
Main Product Characteristics:

V_{DS}	1200V
I_D	44A
$R_{DS(on)}$	75mΩ



TO-247-4L



Schematic Diagram

Features and Benefits:

- High blocking voltage with low on-resistance
- High speed switching,very low switching losses
- High blocking voltage with low on-resistance
- Fast intrinsic diode with low reverse recovery (Qrr)
- Temperature independent turn-off switching losses

Applications:

- On-board charger/PFC
- EV battery chargers
- Booster/DC-DC converter
- Switch mode power supplies

Absolute Max Rating:

Symbol	Parameter	Value	Units
V_{DS}	Drain Source Voltage	1200	V
$V_{GS,max}$	Gate Source Voltage,Absolute Maximum Values	-8 /+22	V
$V_{GS,op}$	Gate Source Voltage,Recommended Operational Values	-4 /+15	V
I_D	Continuous Drain Current @T_C = 25 °C	44	A
	Continuous Drain Current @T_C = 100 °C	31	
$I_{D(puls)}$	Pulsed Drain Current， Pulse Width t_P limited by $T_{j,max}$	88	
P_D	Power Dissipation @T_C = 25˚C, T_J = 175˚C	224	W
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	°C
T_L	Soldering Temperature	260	°C

Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Thermal Resistance,Junction-to-case	—	0.7	°C/W
$R_{\theta JA}$	Thermal Resistance,Junction-to-ambient	—	35	°C/W

Electrical Characteristics @T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	1200	—	—	V	V_{GS} = 0V, I_D = 100μA
$R_{DS(on)}$	Static Drain-to-Source On-resistance	—	75	90	mΩ	V_{GS}=15V,I_D = 20A
		—	110	—		V_{GS}=15V,I_D=20A,T_J=175°C
		—	60	74		V_{GS}=18V,I_D = 20A
		—	109	—		V_{GS}=18V,I_D=20A,T_J=175°C
$V_{GS(th)}$	Gate Threshold Voltage	2.3	—	3.6	V	V_{DS} = V_{GS}, I_D = 5mA
I_{DSS}	Drain-to-Source Leakage Current	—	—	10	μA	V_{DS} = 1200V,V_{GS} = 0V
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V_{GS} =15V,V_{DS} = 0V
gfs	Transconductance	—	9.7	—	S	V_{DS} = 20V, I_D =20A
R_g	Internal Gate Resistance	—	1.5	—	Ω	V_{AC} = 25mV, f =1MHz
Q_g	Total Gate Charge	—	41	—	nC	V_{DS} = 800V, V_{GS} = -4/+15V, I_D = 20A
Q_{gs}	Gate-to-Source Charge	—	8.8	—		
Q_{gd}	Gate-to-Drain("Miller") Charge	—	26	—		
$t_{d(on)}$	Turn-on Delay Time	—	8.7	—	ns	V_{DS} = 800V, V_{GS}=-4/+15V I_D = 20A, Rg = 0Ω L = 120uH
t_r	Rise Time	—	10.4	—		
$t_{d(off)}$	Turn-Off Delay Time	—	14	—		
t_f	Fall Time	—	8.3	—		
E_{on}	Turn on Switching Energy	—	113	—	μJ	
E_{off}	Turn off Switching Energy	—	24	—		
C_{iss}	Input Capacitance	—	1035	—	pF	V_{GS} = 0V V_{DS} = 1000V f =1MHz
C_{oss}	Output Capacitance	—	64	—		
C_{rss}	Reverse Transfer Capacitance	—	3.7	—		
E_{oss}	Coss Stored Energy	—	41	—	μJ	

Electrical Characteristics of the Diode@T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous diode forward current	—	44	—	A	V_{GS} = -4V, Tc = 25°C
V_{SD}	Diode Forward Voltage	—	3.8	—	V	V_{GS} = -4V, I_{SD} = 20A
trr	Reverse recovery time	—	39	—	ns	V_R = 800V, V_{GS} = -4V I_D = 20A ,di/dt = 2436A/μS ,T_J = 150°C
Q_{rr}	Reverse Recovery Charge	—	321	—	nC	
I_{RRM}	Diode Peak Reverse Recovery Current	—	16.5	—	A	

Typical Electrical and Thermal Characteristics

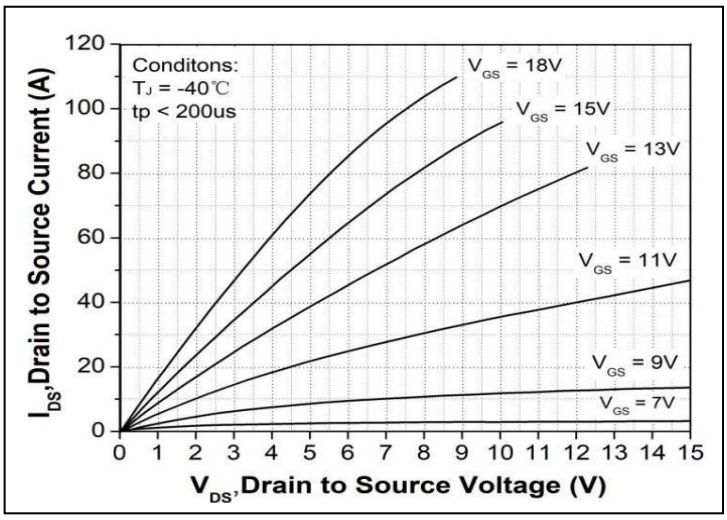


Figure1. Typical Output Characteristics@T_J=-40℃

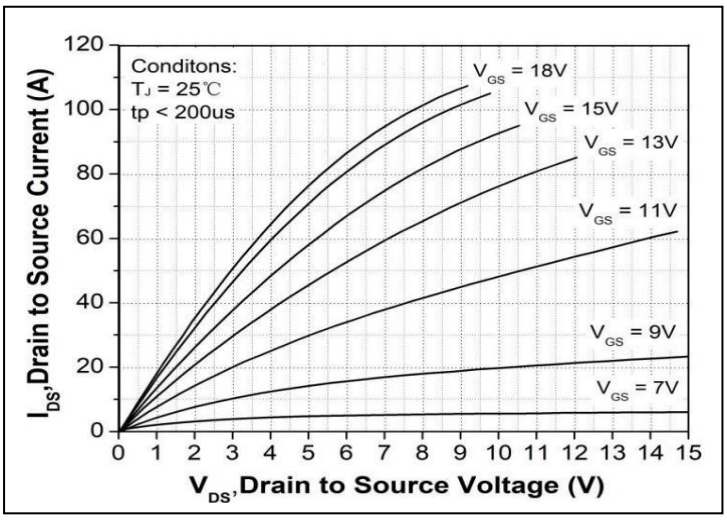


Figure2. Typical Output Characteristics@T_J=25℃

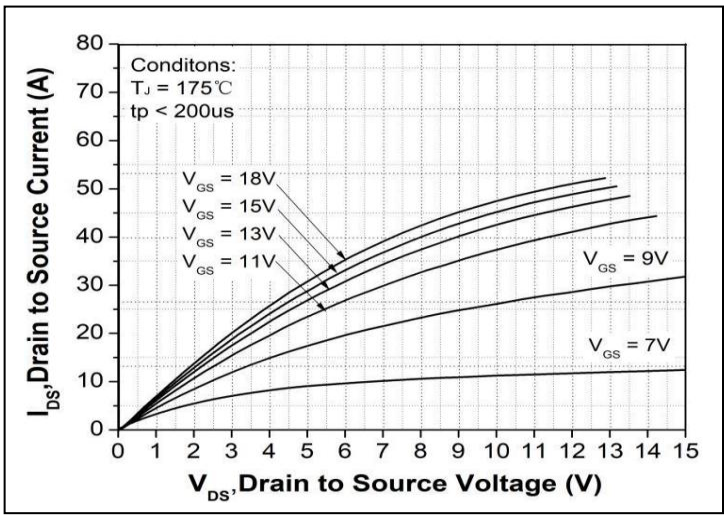


Figure3.Typical Output Characteristics@T_J=175℃

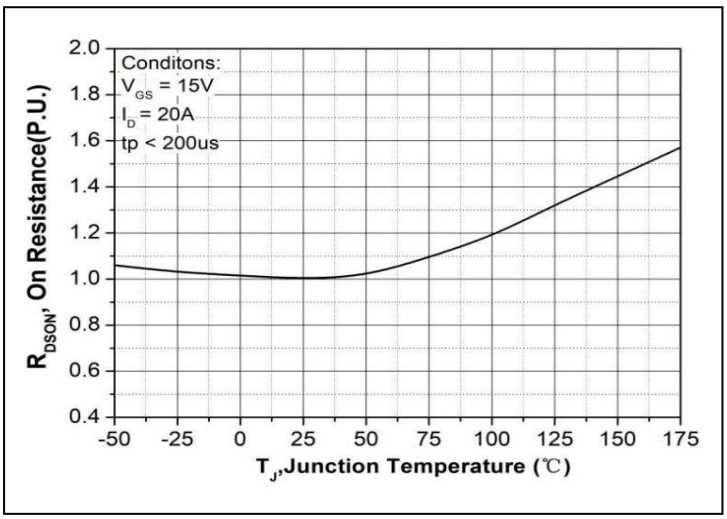


Figure4. Normalized on-resistance vs. Temperature

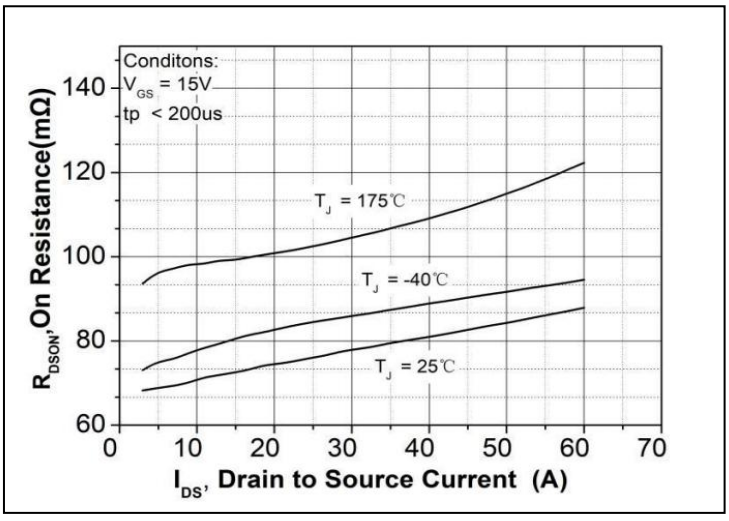


Figure5. On-resistance vs. Drain Current

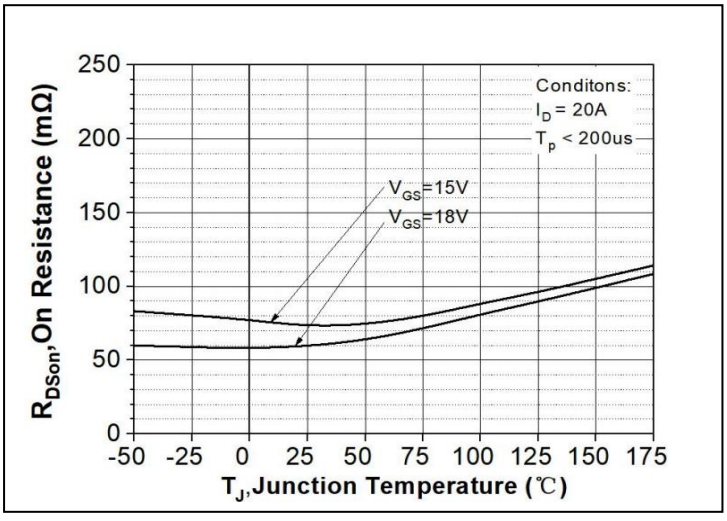


Figure6. On-resistance vs. Temperature various gate

Typical Electrical and Thermal Characteristics

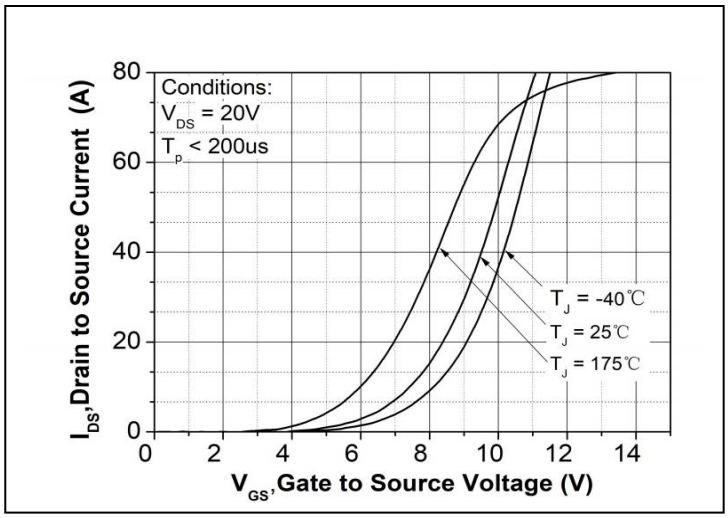


Figure7.Transfer Characteristic for Various Junction Temperatures

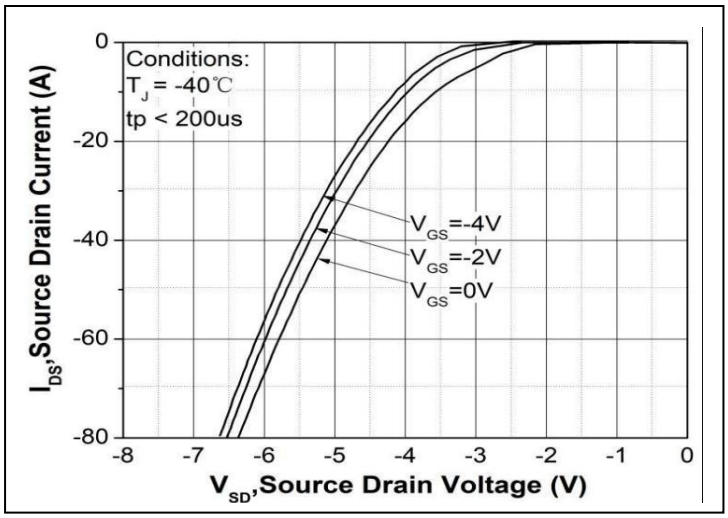


Figure8.Body Diode Characteristic @T_J = -40 ºC

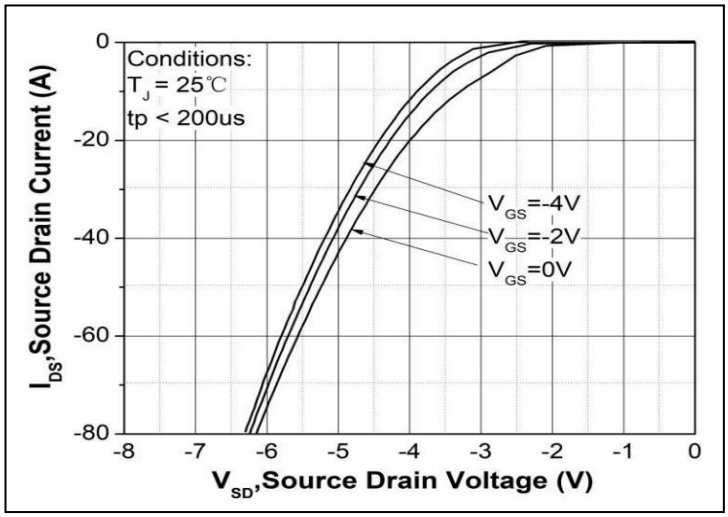


Figure9.Body Diode Characteristic @T_J = 25 ºC

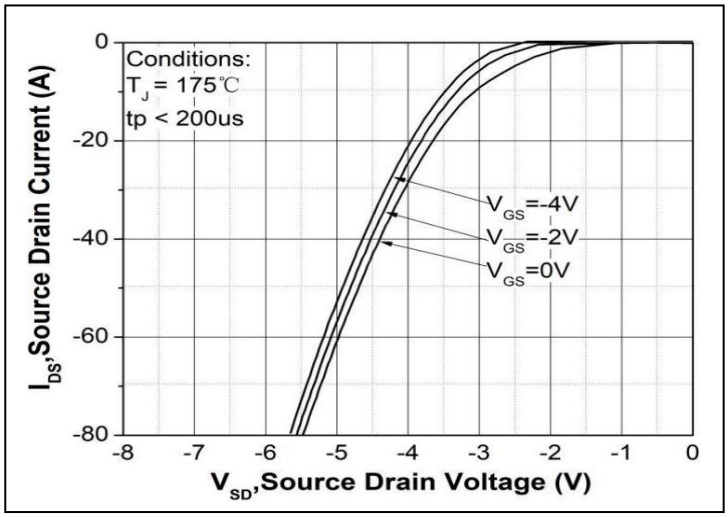


Figure10.Body Diode Characteristic @T_J = 175 ºC

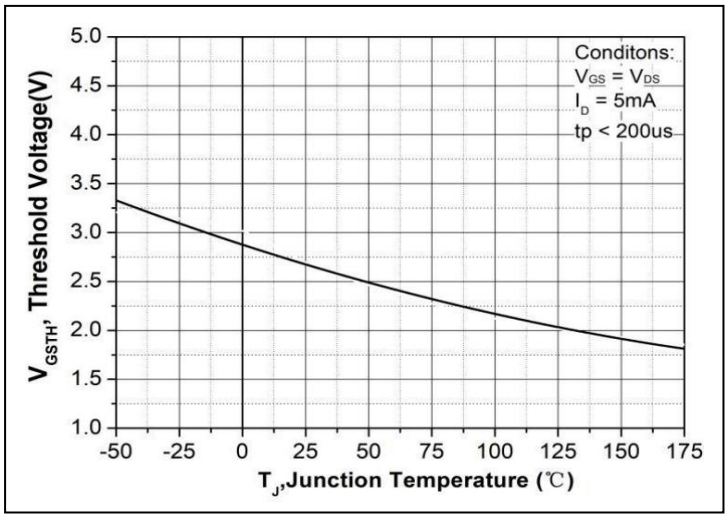


Figure11.Threshold Voltage vs. Temperature

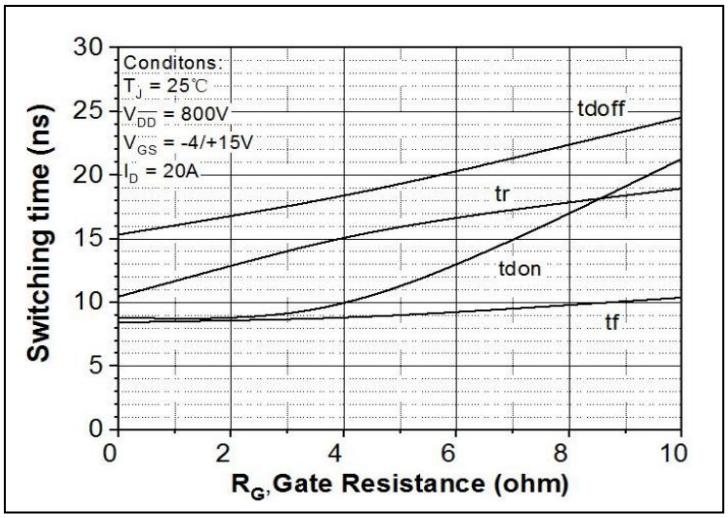


Figure12.Switching times vs. R_G(ext)

Typical Electrical and Thermal Characteristics

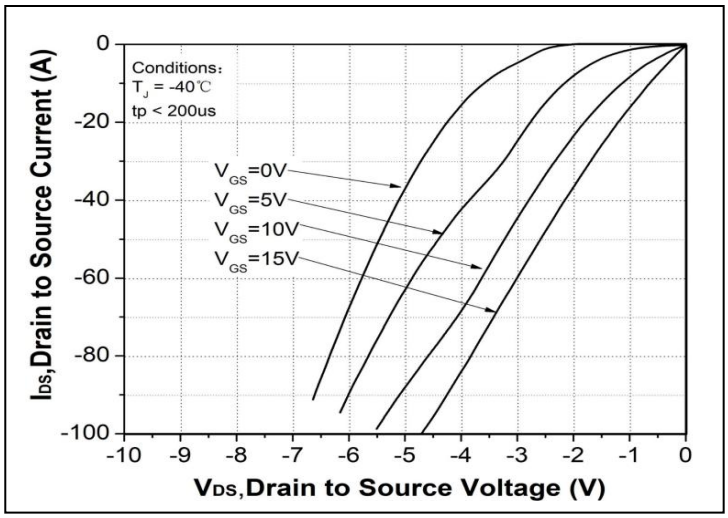


Figure13.3rd Quadrant Characteristic @ T_J = -40 ºC

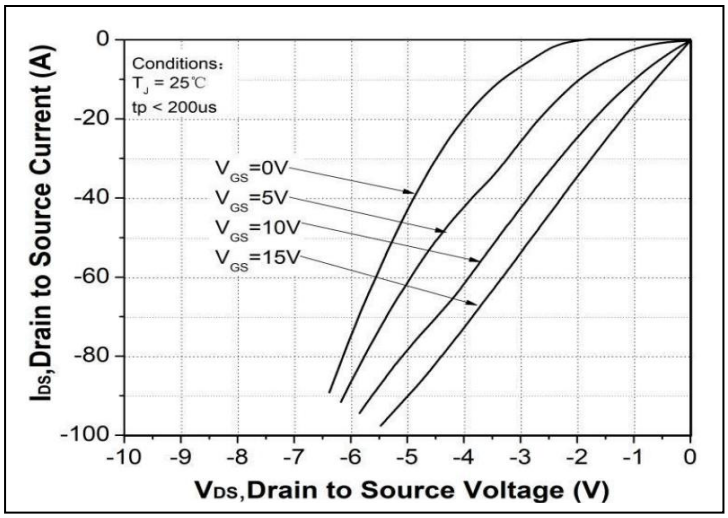


Figure14.3rd Quadrant Characteristic @ T_J = 25 ºC

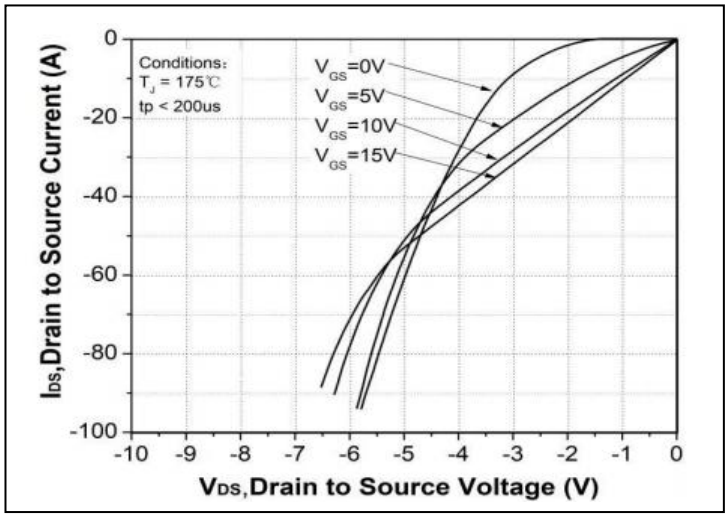


Figure15.3rd Quadrant Characteristic @ T_J = 175 ºC

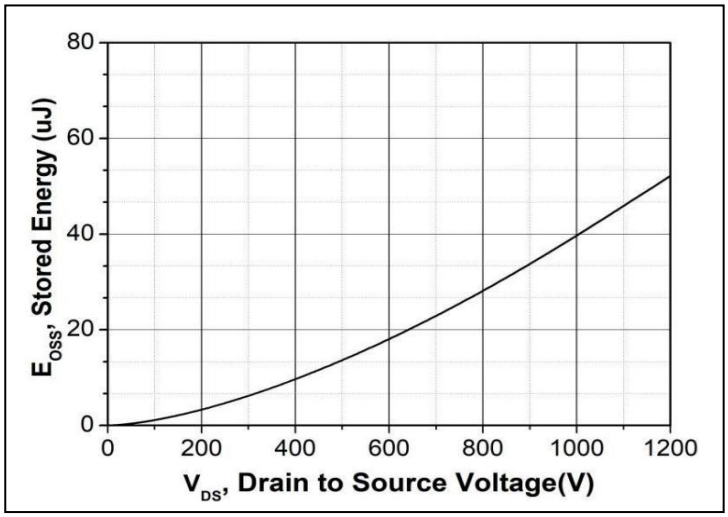


Figure16.Output Capacitor Stored Energy

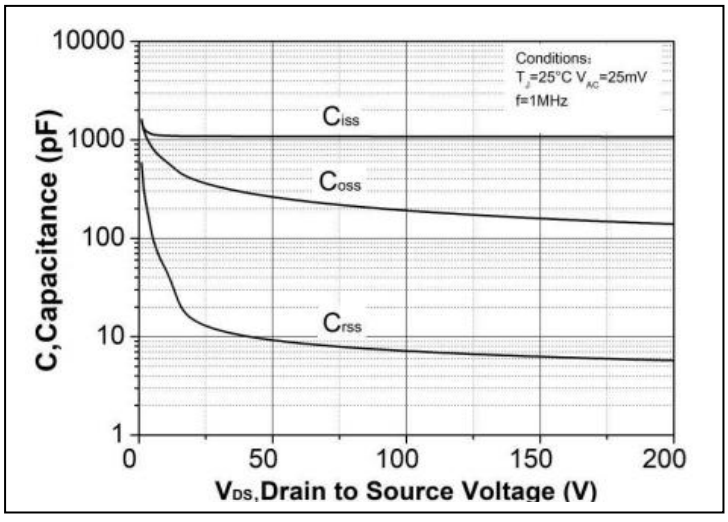


Figure17.Capacitances vs. Drain-source Voltage (0~200V)

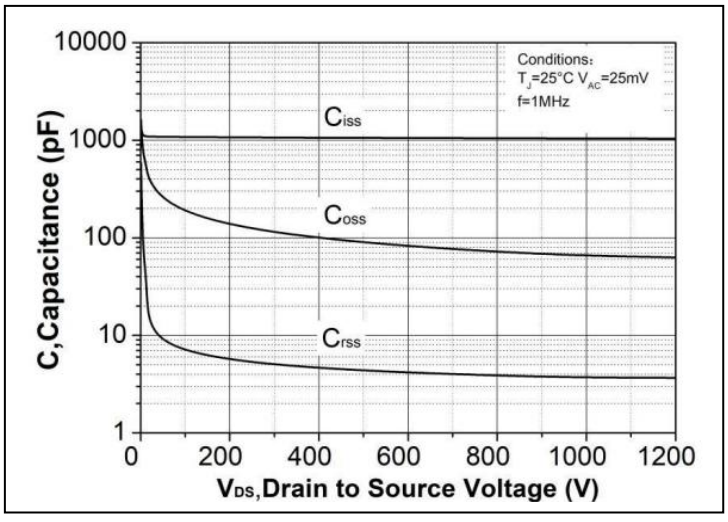


Figure18.Capacitances vs. Drain-source Voltage (0~1200V)

Typical Electrical and Thermal Characteristics

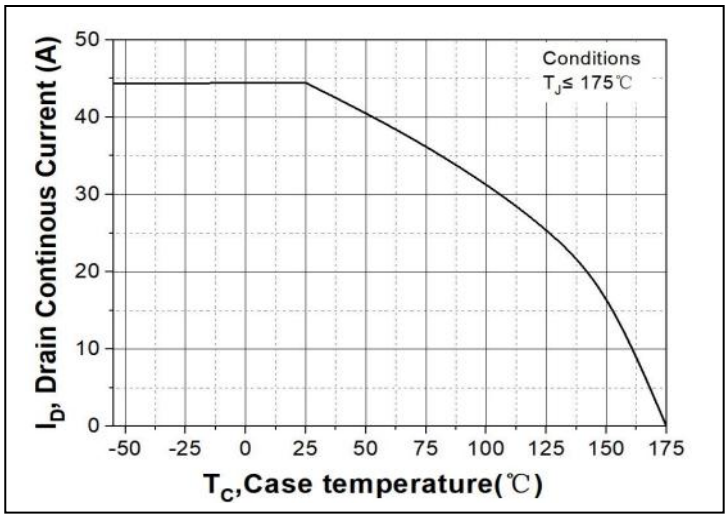


Figure19.Continuous Drain Current Derating vs.Case Temperature

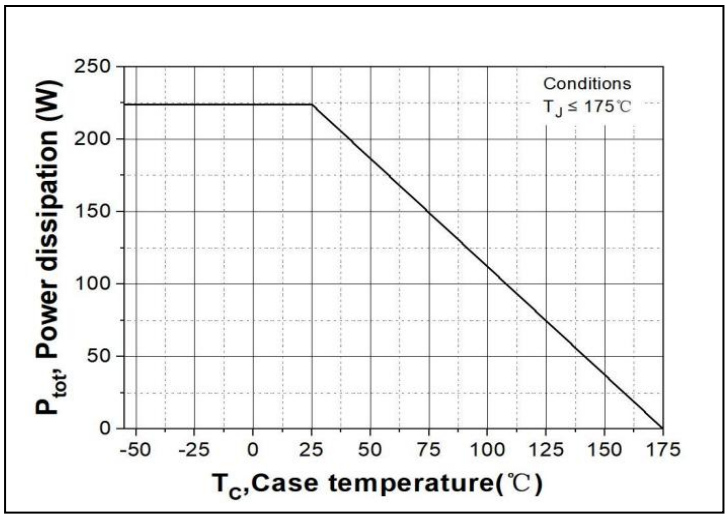


Figure20.Maximum Power Dissipation Derating vs. Case Temperature

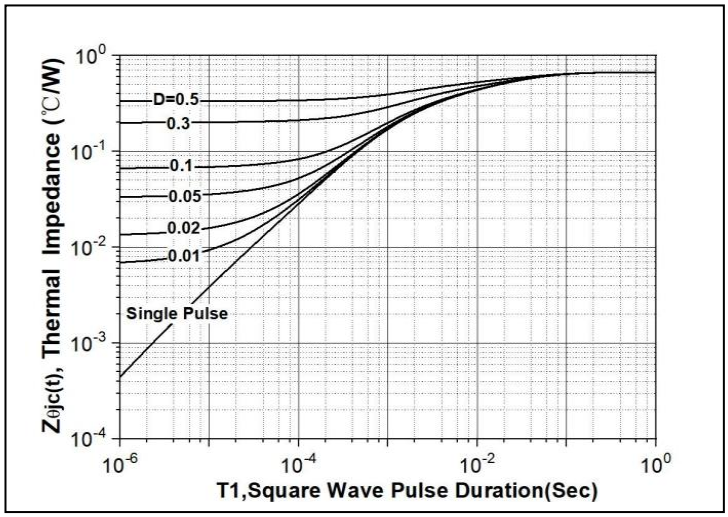


Figure21.Transient Thermal Impedance (Junction - Case)

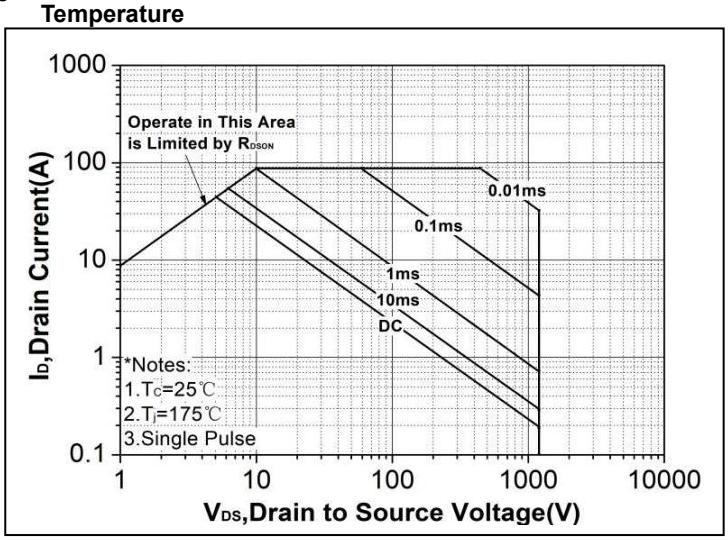


Figure22.Safe Operating Area

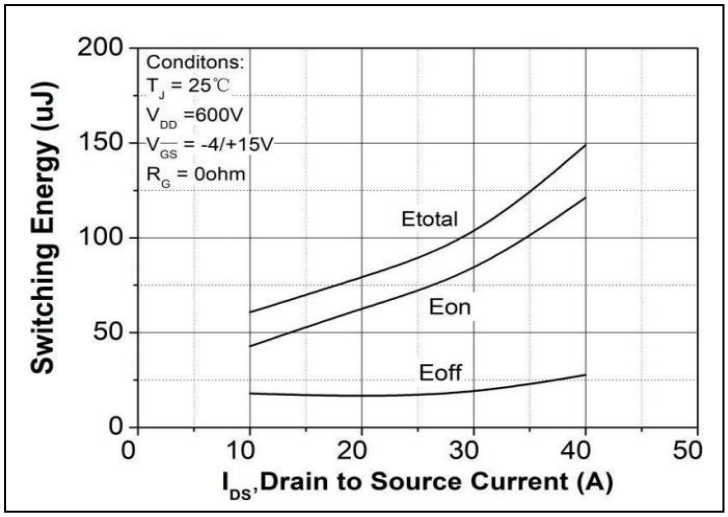


Figure23.Clamped Inductive Switching Energy vs. Drain Current (V_{DD} = 600V)

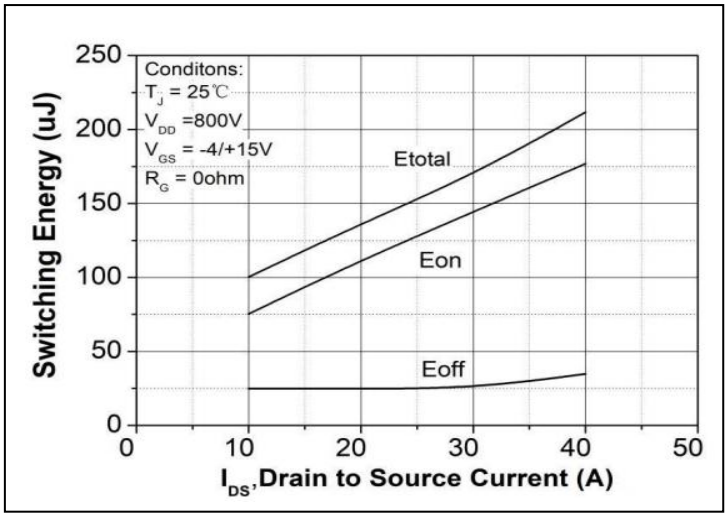
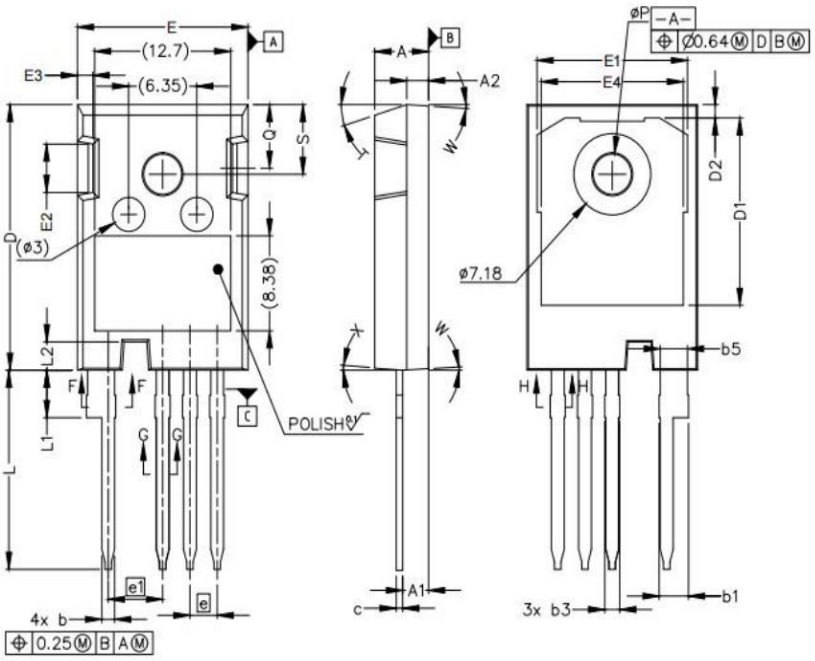
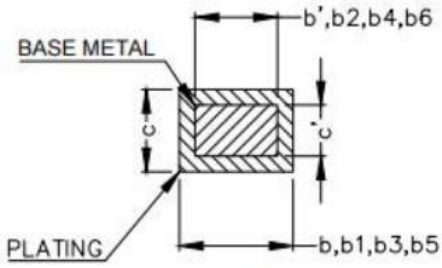


Figure24.Clamped Inductive Switching Energy vs. Drain Current (V_{DD} = 800V))

Mechanical Data：

Unit:mm





SECTION "F-F", "G-G" AND "H-H"
SCALE: NONE

SYMBOL	MILLIMETERS	
	MIN	MAX
A	4.83	5.21
A1	2.29	2.54
A2	1.91	2.16
b'	1.07	1.28
b	1.07	1.33
b1	2.39	2.94
b2	2.39	2.84
b3	1.07	1.60
b4	1.07	1.50
b5	2.39	2.69
b6	2.39	2.64
c'	0.55	0.65
c	0.55	0.68
D	23.30	23.60
D1	16.25	17.65
D2	0.95	1.25
E	15.75	16.13
E1	13.10	14.15
E2	3.68	5.10
E3	1.00	1.90
E4	12.38	13.43
e	2.54 BSC	
e1	5.08 BSC	
N	4	
L	17.31	17.82
L1	3.97	4.37
L2	2.35	2.65
øP	3.51	3.65
Q	5.49	6.00
S	6.04	6.30
T	17.5° REF.	
W	3.5 ° REF.	
X	4° REF.	

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