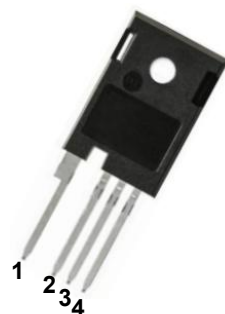
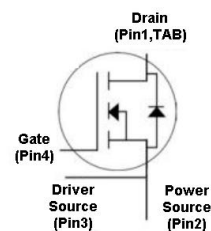


Main Product Characteristics:

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



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 (Q_{rr})
- 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 @ $T_C = 25^\circ C$	44	A
	Continuous Drain Current @ $T_C = 100^\circ C$	31	
$I_{D(puls)}$	Pulsed Drain Current, Pulse Width t_p limited by $T_{j,max}$	88	
P_D	Power Dissipation @ $T_C = 25^\circ C, T_J = 175^\circ C$	224	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	$^\circ C$
T_L	Soldering Temperature	260	$^\circ C$

Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
R _{θJC}	Thermal Resistance, Junction-to-case	—	0.7	°C/W
R _{θJA}	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
g _{fs}	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, R _g = 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	—		

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, T _C = 25°C
V _{SD}	Diode Forward Voltage	—	3.8	—	V	V _{GS} = -4V, I _{SD} = 20A
t _{rr}	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

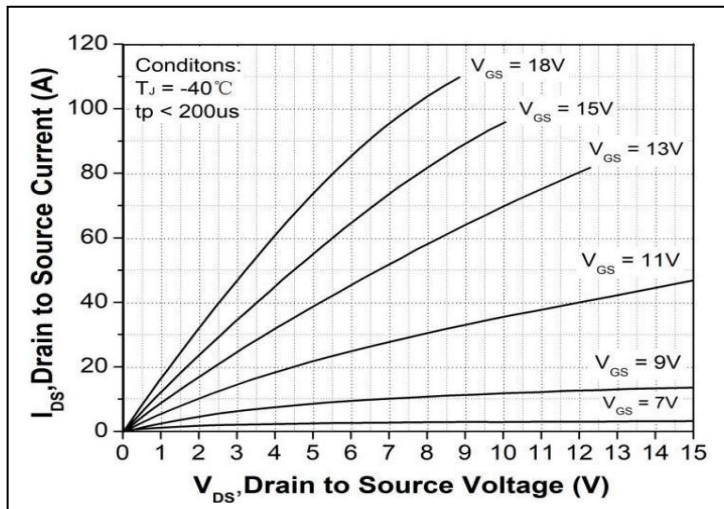


Figure1. Typical Output Characteristics@T_J=-40°C

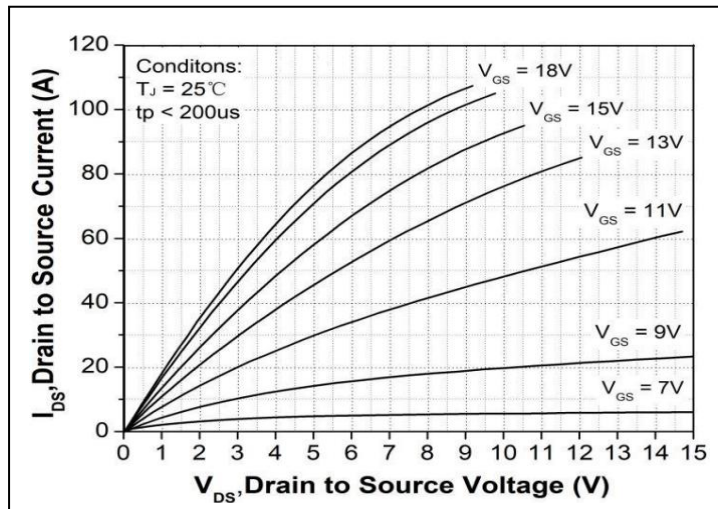


Figure2. Typical Output Characteristics@T_J=25°C

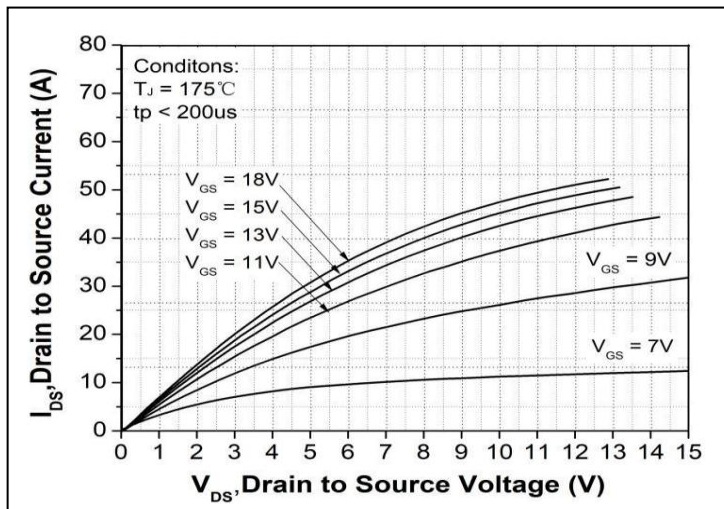


Figure3. Typical Output Characteristics@T_J=175°C

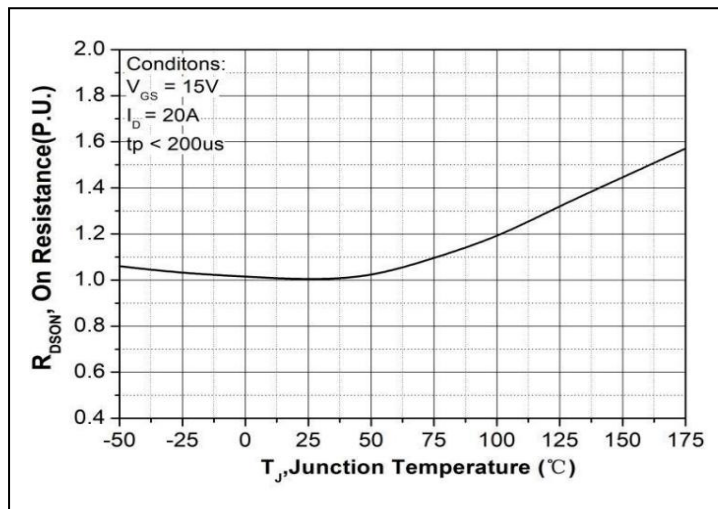


Figure4. Normalized on-resistance vs. Temperature

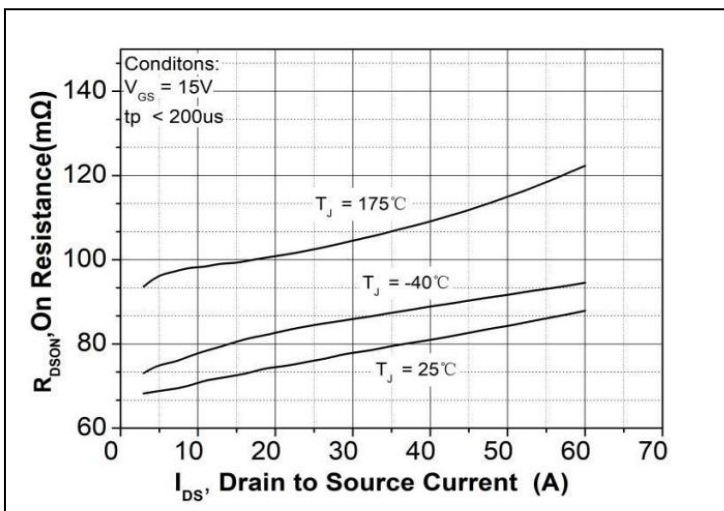


Figure5. On-resistance vs. Drain Current

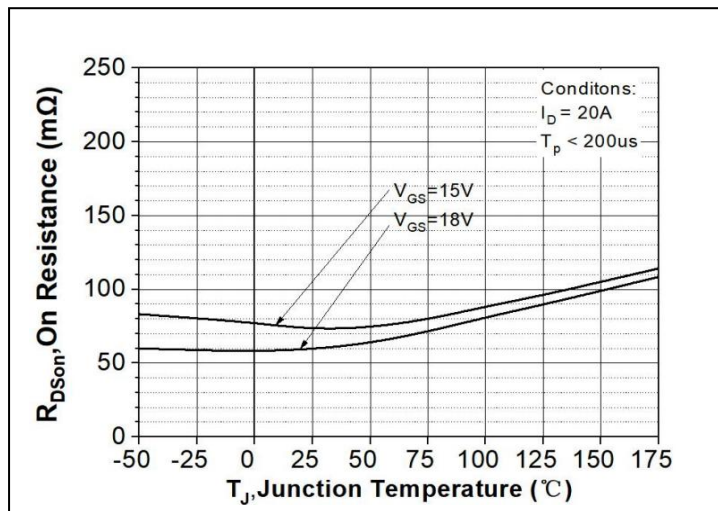


Figure6. On-resistance vs. Temperature various gate

Typical Electrical and Thermal Characteristics

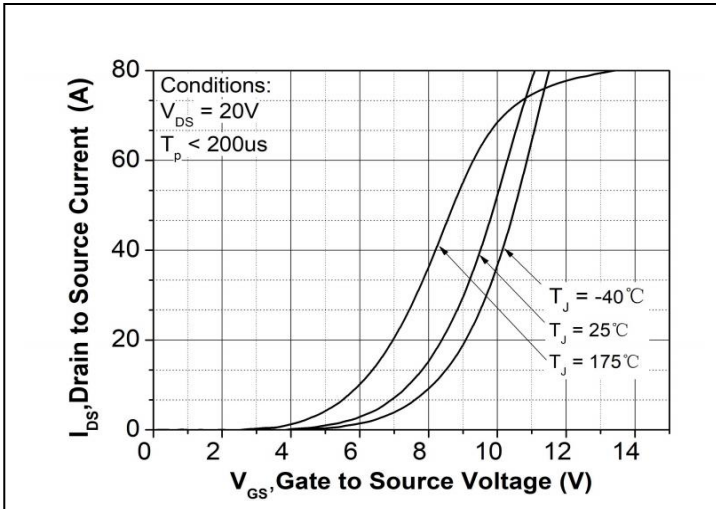


Figure7.Transfer Characteristic for Various Junction Temperatures

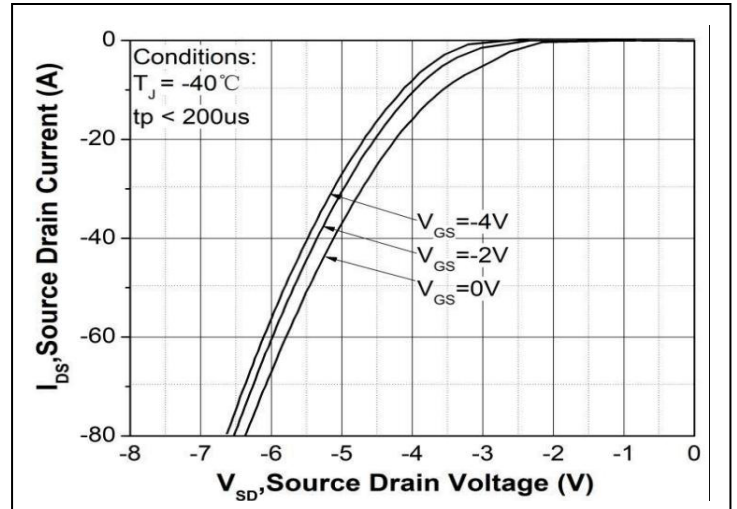


Figure8.Body Diode Characteristic @T_J = -40 °C

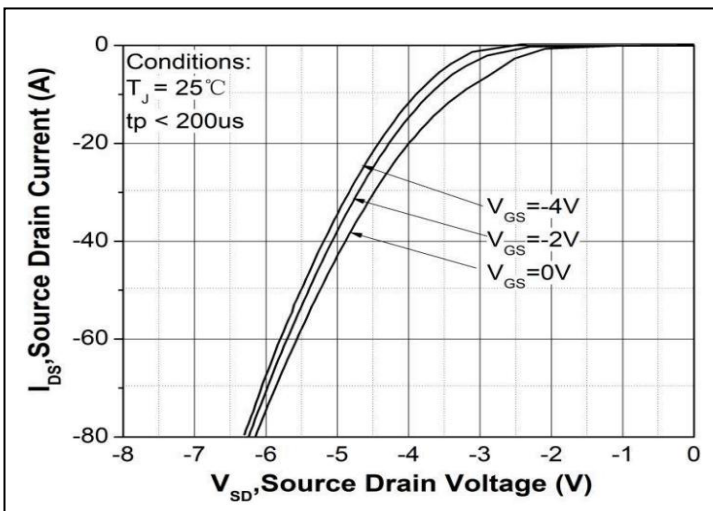


Figure9.Body Diode Characteristic @T_J = 25 °C

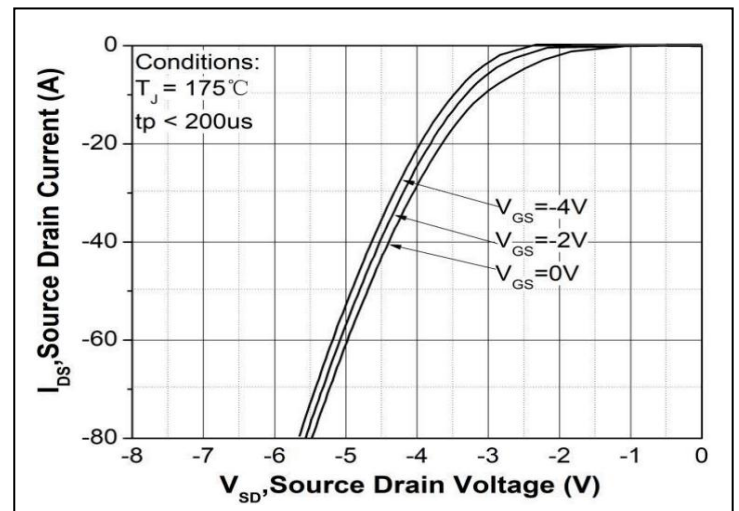


Figure10.Body Diode Characteristic @T_J = 175 °C

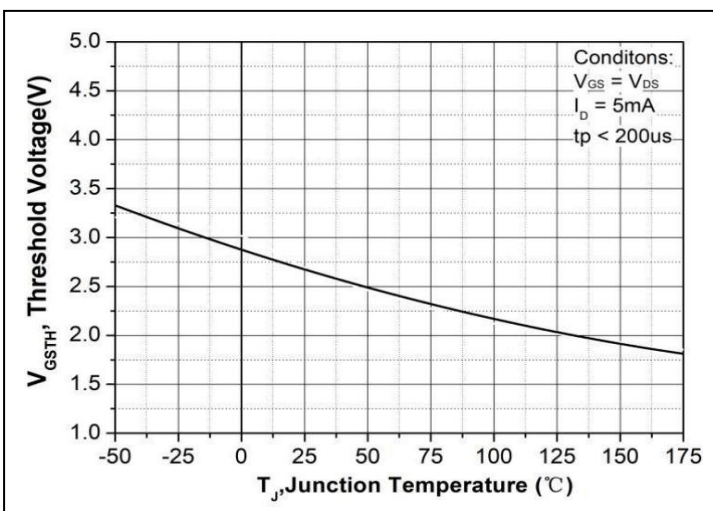


Figure11.Threshold Voltage vs. Temperature

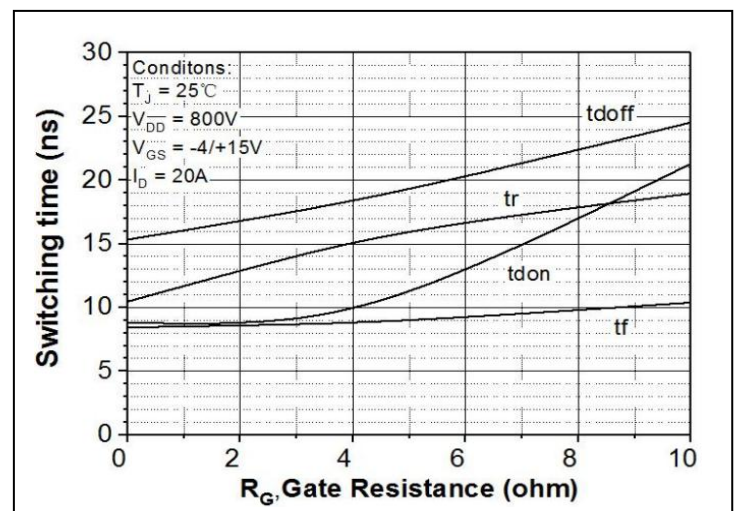


Figure12.Switching times vs. R_G(ext)

Typical Electrical and Thermal Characteristics

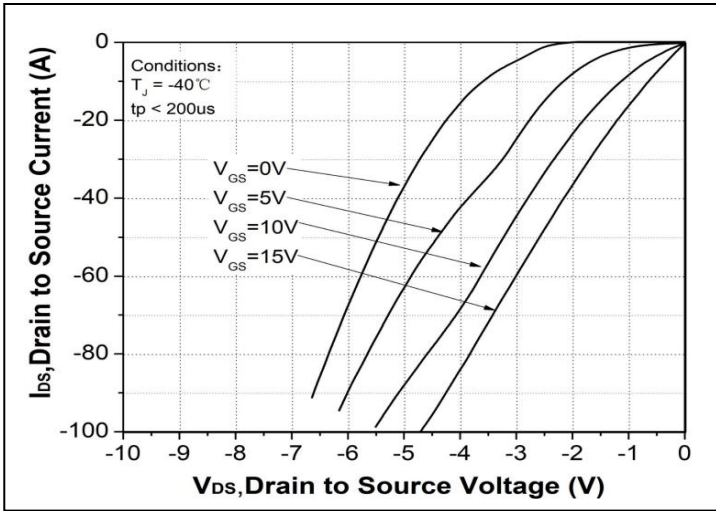


Figure13.3rd Quadrant Characteristic @ $T_J = -40\text{ }^\circ\text{C}$

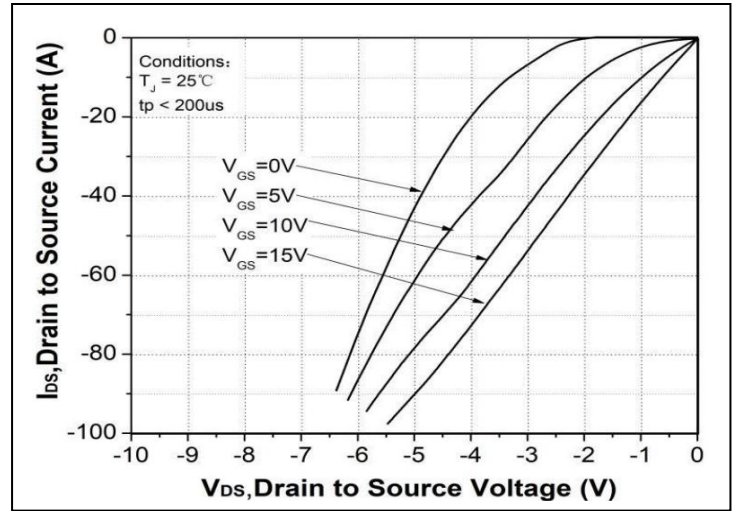


Figure14.3rd Quadrant Characteristic @ $T_J = 25\text{ }^\circ\text{C}$

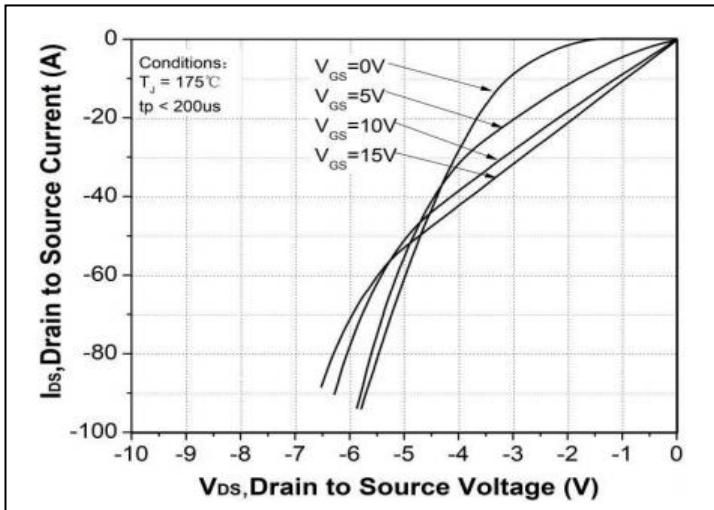


Figure15.3rd Quadrant Characteristic @ $T_J = 175\text{ }^\circ\text{C}$

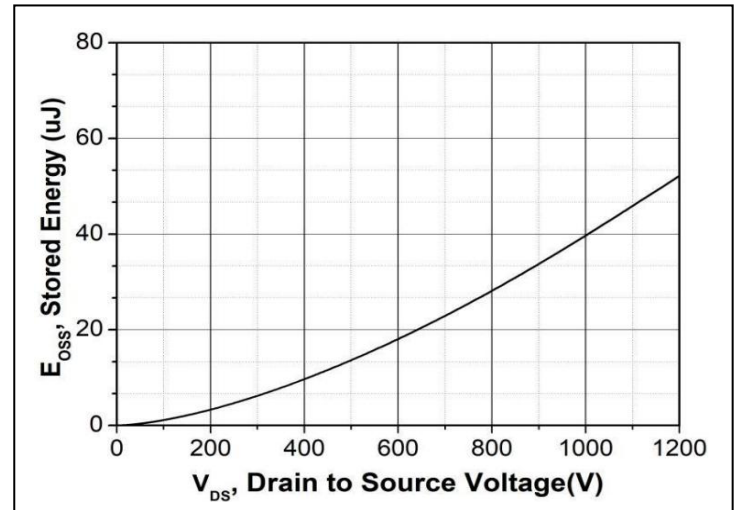


Figure16.Output Capacitor Stored Energy

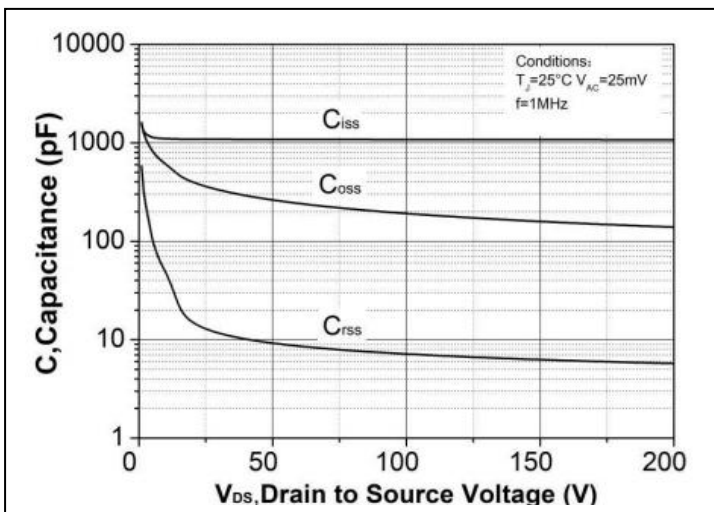


Figure17.Capacitances vs. Drain-source Voltage (0~200V)

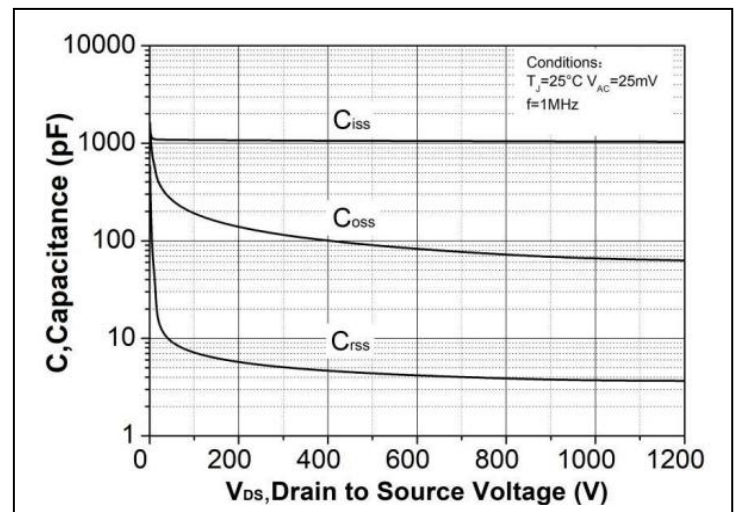


Figure18.Capacitances vs. Drain-source Voltage (0~1200V)

Typical Electrical and Thermal Characteristics

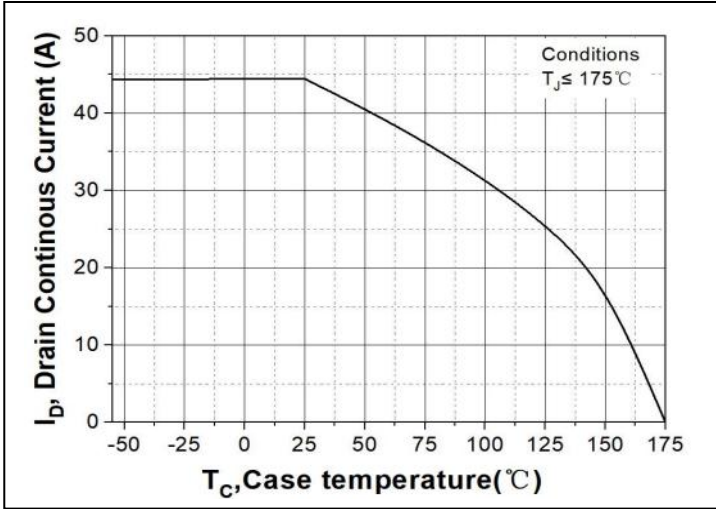


Figure19.Continuous Drain Current Derating vs.Case Temperature

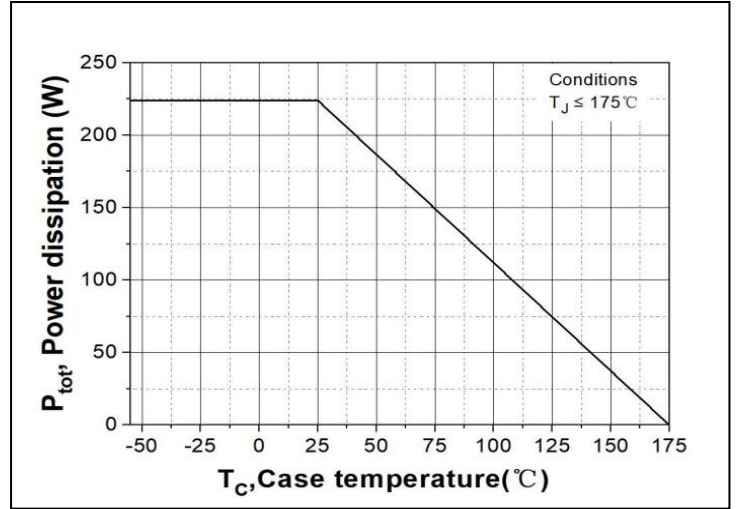


Figure20.Maximum Power Dissipation Derating vs. Case Temperature

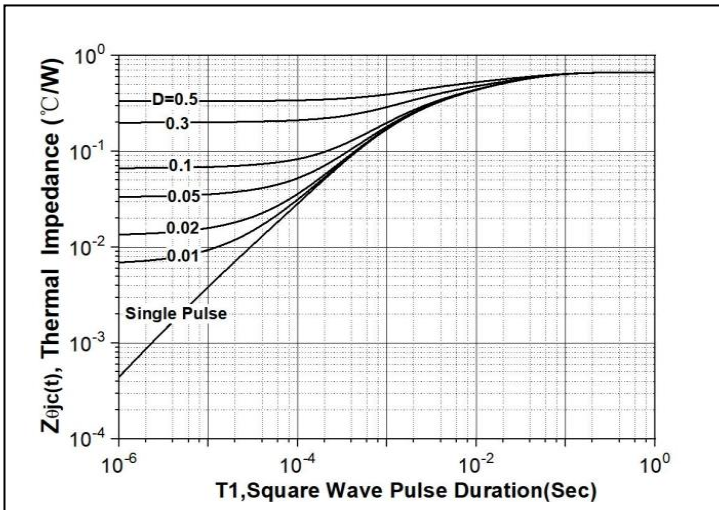


Figure21.Transient Thermal Impedance (Junction - Case)

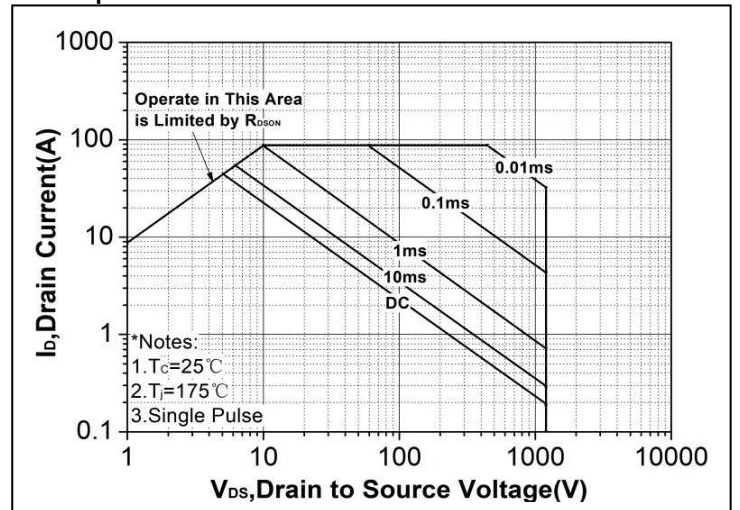


Figure22.Safe Operating Area

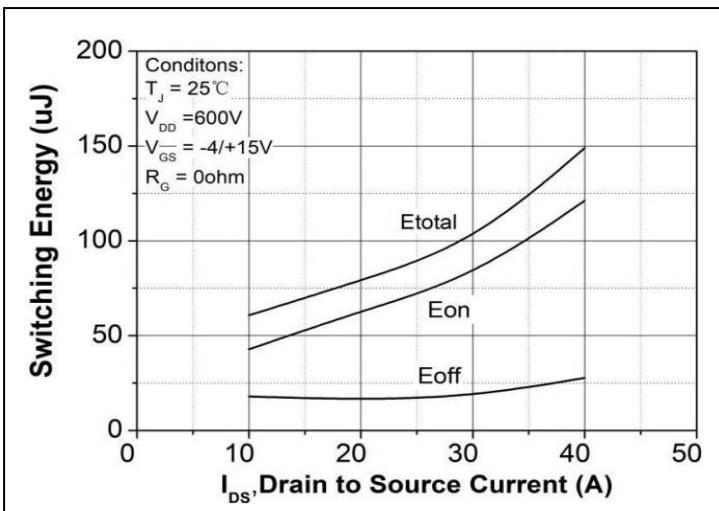


Figure23.Clamped Inductive Switching Energy vs. Drain Current (VDD = 600V)

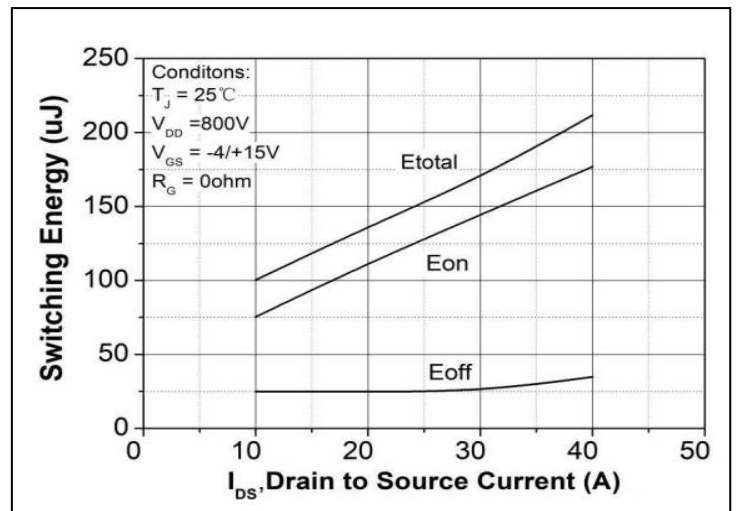
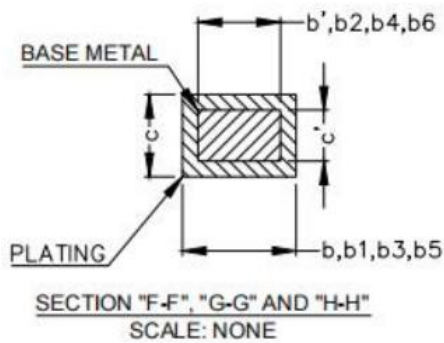
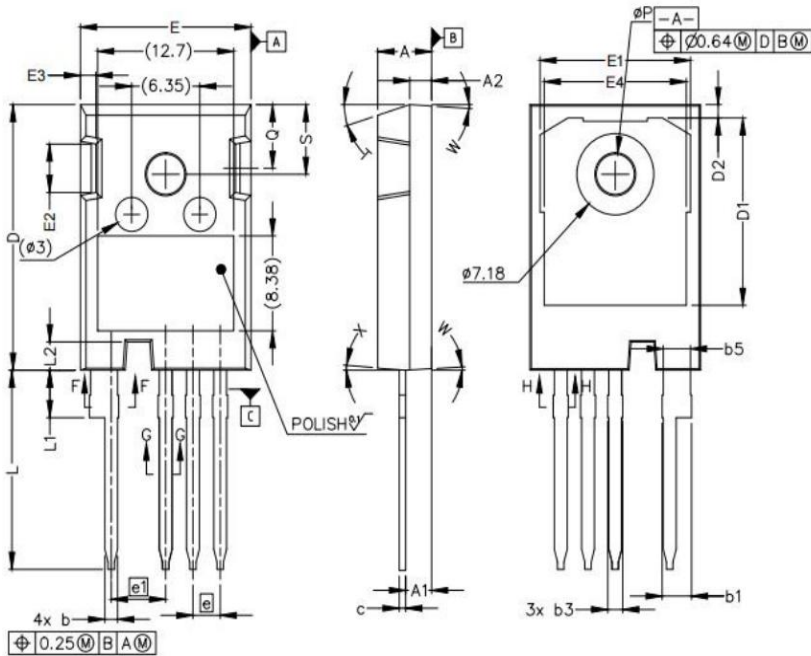


Figure24.Clamped Inductive Switching Energy vs. Drain Current (VDD = 800V)

Mechanical Data:

Unit:mm



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
ϕP	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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