Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness
- Halogen Free, RoHS Compliant

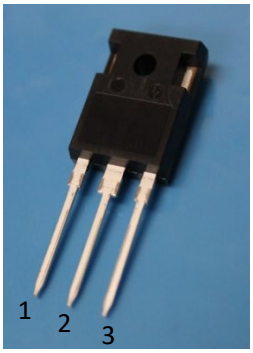
Benefits

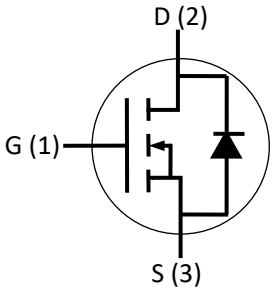
- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

Applications

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives
- Pulsed Power applications

Package





Maximum Ratings (T_c = 25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain - Source Voltage	650	V	V_{GS}=0V,I_D=100μA	
V_{GSmax}	Gate - Source Voltage	-8/+22	V	Absolute maximum values	
V_{GSop}	Gate - Source Voltage	-5/+18	V	Recommended operational values	
I_D	Continuous Drain Current	40 29	A	V_{GS}=20V , T_C=25°C V_{GS}=20V , T_C=100°C	
I_{DM}	Pulse Drain Current	90	A	Pulse width limited by T_{jmax}	
P_D	Power Dissipation	150	W	T_C=25°C, T_J=175°C	Fig. 11
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	°C		

Electrical Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	650			V	V_{GS}=0V,I_D=100μA	
$V_{GS(th)}$	Gate Threshold Voltage	2.0	3.2	4.0	V	V_{GS}= V_{DS}, I_{DS}=5mA,T_C=25°C	Fig. 6
			2.3			V_{GS}= V_{DS}, I_{DS}=5mA,T_C=175°C	
I_{DSS}	Zero Gate Voltage Drain Current		1	100	μA	V_{DS}= 650V, V_{GS}=0V	
I_{GSS}	Gate-Source Leakage Current		50	200	nA	V_{GS}=18V, V_{DS}= 0V	
$R_{DS(on)}$	Drain-Source on-state Resistance		45	65	mΩ	V_{GS} = 18 V, I_D=20A, T_C=25°C	Fig. 4
			75			V_{GS} = 18 V, I_D=20A, T_C=175°C	
g_{fs}	Transconductance		12		S	V_{DS} = 20 V, I_D = 20A, T_J = 25 °C	Fig. 5
			11		S	V_{DS} = 20 V, I_D = 20A, T_J = 175 °C	
Ciss	Input Capacitance		1100		pF	V_{GS}=0V, V_{DS}=400 V, f=1MHz V_{AC}=25 mV	Fig. 9
Coss	Output Capacitance		56				
Crss	Reverse Transfer Capacitance		15				
E_{ON}	Turn-On Switching Energy		110		μJ	V_{DS}=400V, V_{GS}=-5/18V, I_D= 20A, $R_{G(ext)}$ = 0Ω	
E_{OFF}	Turn-Off Switching Energy		32				
$t_{d(on)}$	Turn-On Delay Time		15		ns	V_{DD}=400V, V_{GS}=-0/20 V I_D = 20A, Timing relative to V_{DS}	
t_r	Rise Time		45				
$t_{d(off)}$	Turn-Off Delay Time		13				
t_f	Fall Time		10				
$R_{G(int)}$	Internal Gate Resistance		6.0		Ω	f=1 MHz, V_{AC}=25mV	
Q_{gs}	Gate to Source Charge		21		nC	V_{DD}=400V, V_{GS}=-0/20 V I_D = 20A	Fig. 10
Q_{gd}	Gate to Drain Charge		14				
Q_g	Total Gate Charge		75				

Reverse Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	3.4		V	V_{GS} = -5V, I_{SD} = 10 A, T_J = 25 °C	Fig. 7
		3.2		V	V_{GS} =- 5V, I_{SD} = 10 A, T_J = 175 °C	Fig. 8
I_S	Continuous Diode Forward Current		30	A	T_C = 25°C	
t_{rr}	Reverse Recovery time	20		ns	V_{GS} = -5V, I_{SD} = 20 A, V_R= 400V, dif/dt=1200A/μs;	
Q_{rr}	Reverse Recovery Charge	65		nC		
I_{rrm}	Peak Reverse Recovery Current	8		A		

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Test Conditions	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.95	℃/W		Fig. 12
$R_{\theta JA}$	Thermal Resistance From Junction to Ambient	35			

Typical Performance

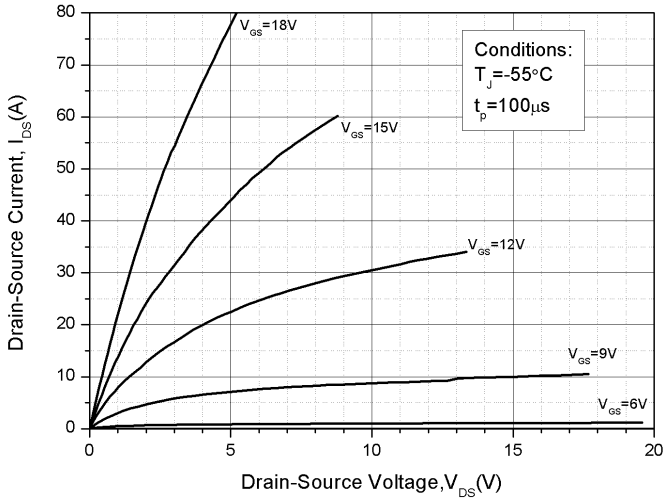


Figure 1. Output Characteristics T_J = -55 °C

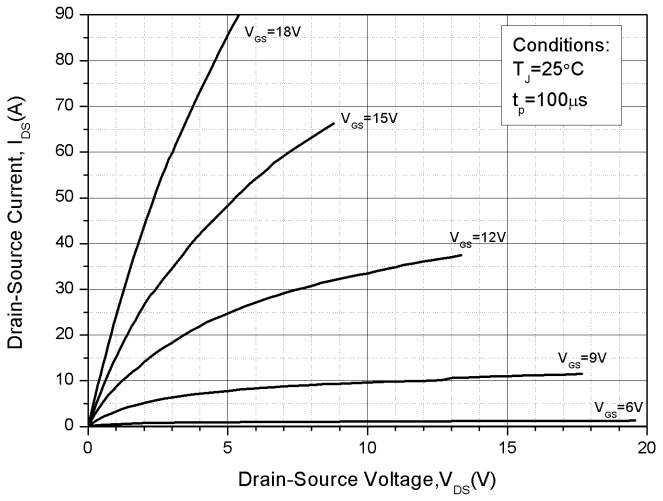


Figure 2. Output Characteristics T_J = 25 °C

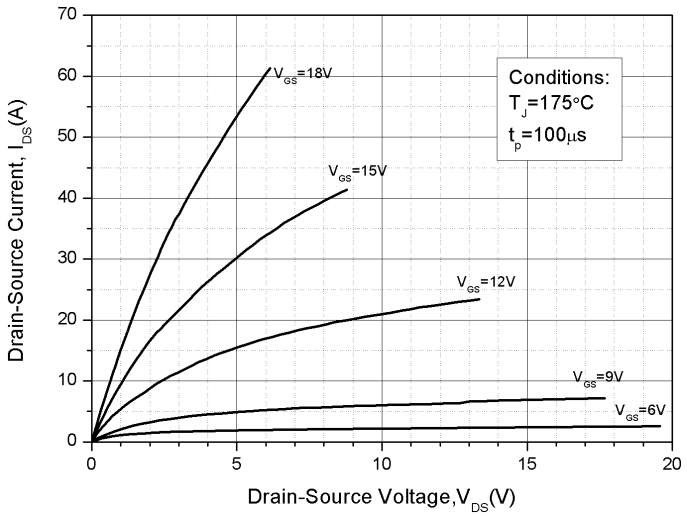


Figure 3. Output Characteristics T_J =175 °C

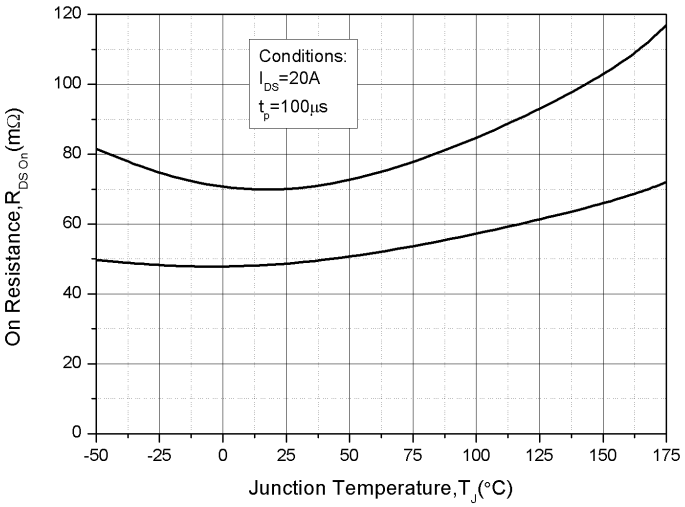


Figure 4. On-Resistance For Various Gate Voltage

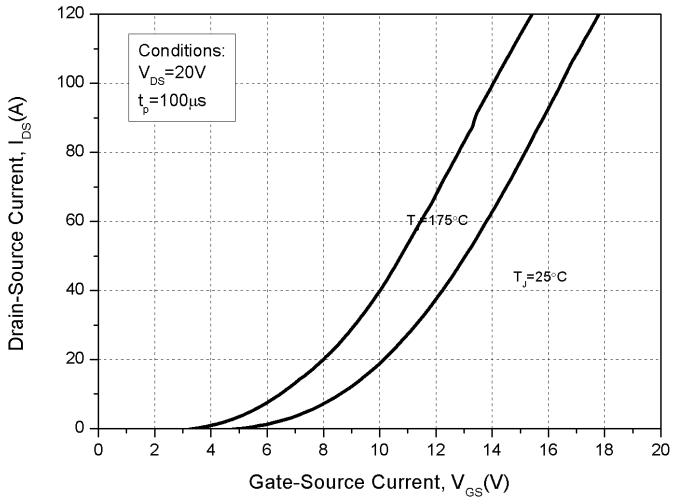


Figure 5. Transfer Characteristic
for Various Junction Temperatures

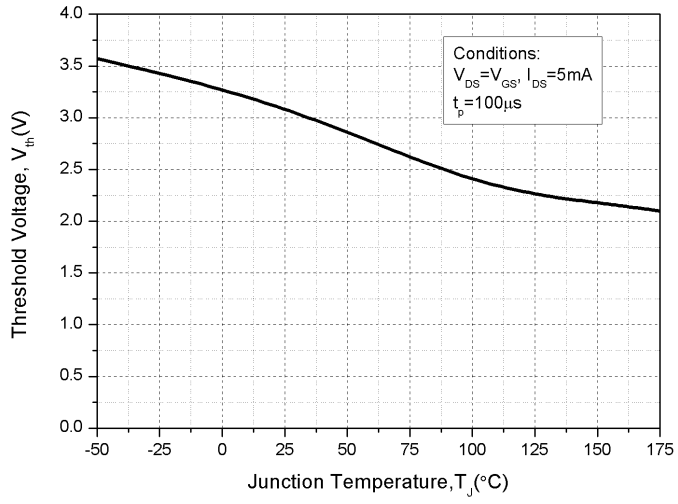


Figure 6. Threshold Voltage vs. Temperature

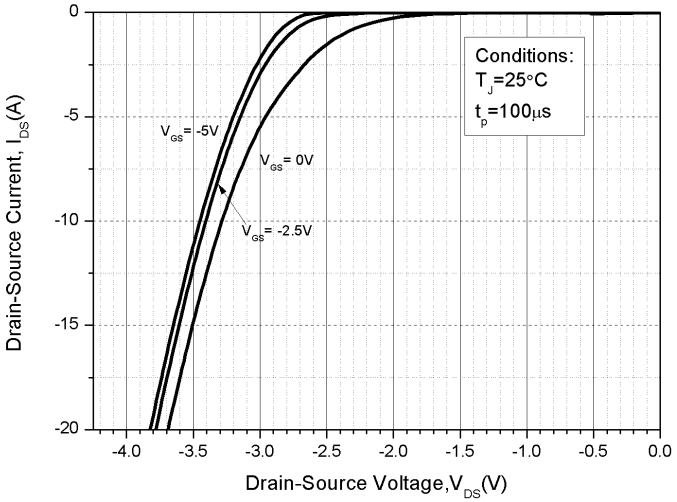


Figure 7. Body Diode Characteristics, T_J = 25 °C

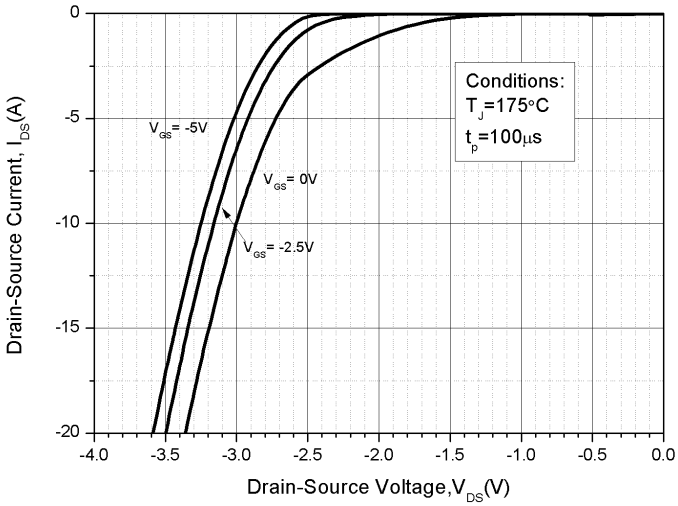


Figure 8. Body Diode Characteristics, T_J = 175 °C

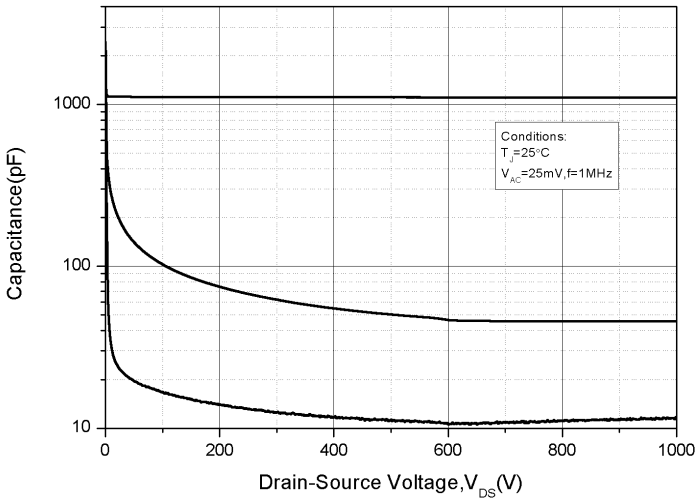


Figure 9. Capacitances vs. Drain-Source Voltage

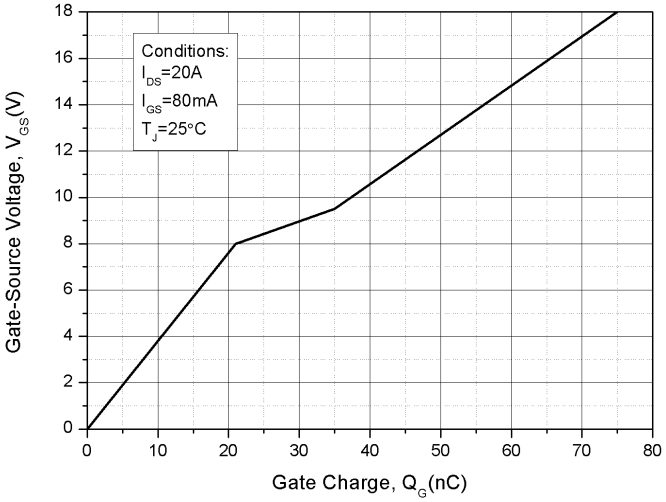


Figure 10. Gate Charge Characteristics

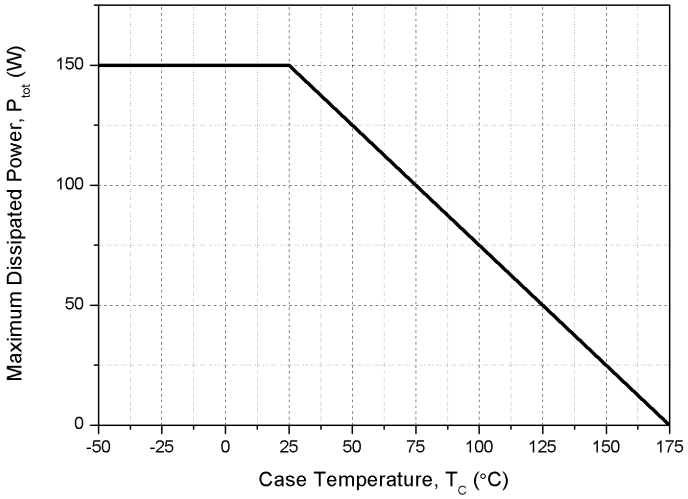


Figure 11. Power Dissipation Derating

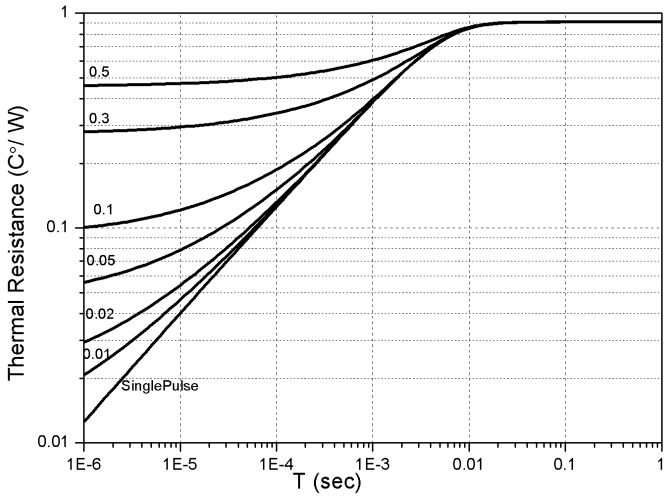
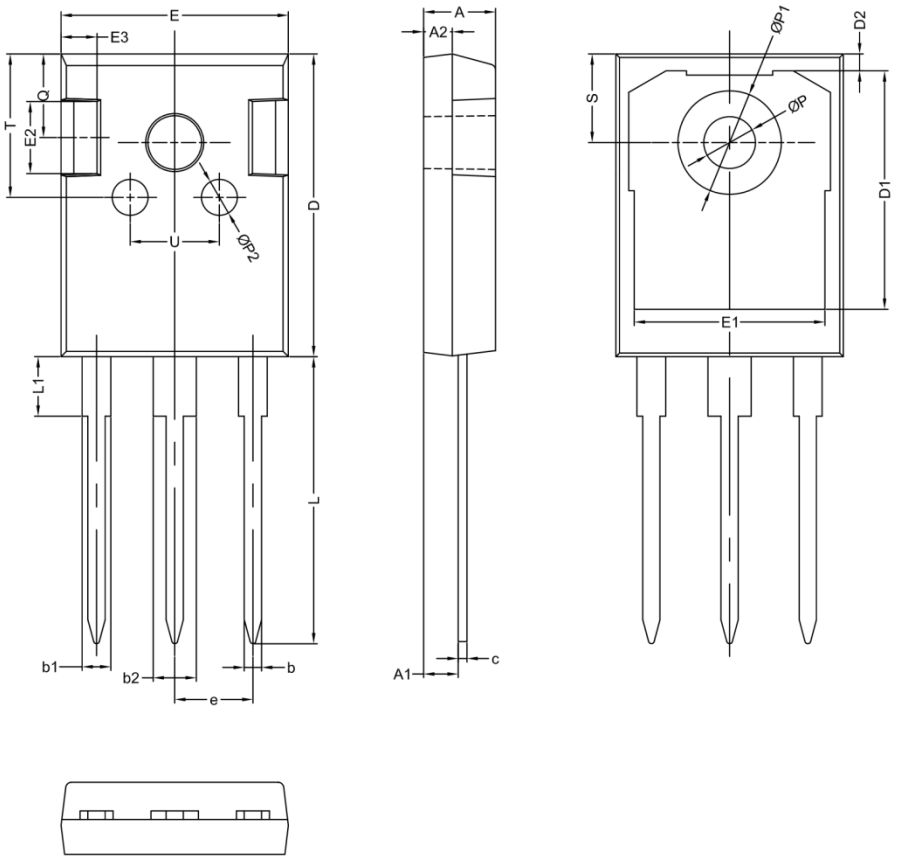


Figure 12. Transient Thermal Impendance

Package Dimensions: TO-247-3L



符号	机械尺寸/mm		
	最小值	典型值	最大值
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.90	2.00	2.10
b	1.10	1.20	1.35
b1		2.00	
b2		3.00	
c	0.55	0.60	0.75
D	20.80	21.00	21.20
D1		16.55	
D2		1.20	
E	15.60	15.80	16.0
E1		13.30	
E2		5.00	
E3		2.50	
e		5.44	
L	19.42	19.92	20.42
L1		4.13	
P	3.50	3.60	3.70
P1	-	-	7.40
P2		2.50	
Q		5.80	
S	6.05	6.15	6.25
T		10.00	
U		6.20	

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