

### 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

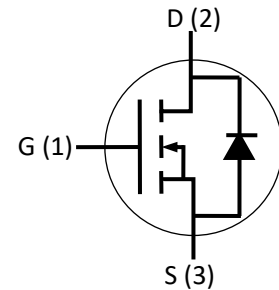
### Applications

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

### Package



TO-247-3



### Maximum Ratings ( $T_c = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
$V_{DSmax}$	Drain - Source Voltage	1200	V	$V_{GS}=0V, I_D=100\mu A$	
$V_{GSmax}$	Gate - Source Voltage	-8/+20	V	Absolute maximum values	
$V_{GSop}$	Gate - Source Voltage	-5/+18	V	Recommended operational values	
$I_D$	Continuous Drain Current	60 40	A	$V_{GS}=18V, T_C=25^\circ\text{C}$ $V_{GS}=18V, T_C=100^\circ\text{C}$	
$I_{DM}$	Pulse Drain Current	100	A	Pulse width limited by $T_{jmax}$	
$P_D$	Power Dissipation	312	W	$T_C=25^\circ\text{C}, T_J=175^\circ\text{C}$	Fig. 11
$T_J, T_{stg}$	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$		

**Electrical Characteristics**

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	1200			V	$V_{GS}=0V, I_D=100\mu A$	
$V_{GS(th)}$	Gate Threshold Voltage	2.0	3.2	4.0	V	$V_{GS}=V_{DS}, I_{DS}=10mA, T_C=25^\circ C$	Fig. 6
			2.0			$V_{GS}=V_{DS}, I_{DS}=10mA, T_C=150^\circ C$	
$I_{DSS}$	Zero Gate Voltage Drain Current		1	100	$\mu A$	$V_{DS}=1200V, V_{GS}=0V$	
$I_{GSS}$	Gate-Source Leakage Current			200	nA	$V_{GS}=20V, V_{DS}=0V$	
$R_{DS(on)}$	Drain-Source on-state Resistance		45	60	m $\Omega$	$V_{GS}=18V, I_D=33A, T_C=25^\circ C$	Fig. 4
			68		m $\Omega$	$V_{GS}=18V, I_D=33A, T_C=175^\circ C$	
$g_{fs}$	Transconductance		20		S	$V_{DS}=20V, I_D=33A, T_J=25^\circ C$	Fig. 5
			18.3		S	$V_{DS}=20V, I_D=33A, T_J=175^\circ C$	
$C_{iss}$	Input Capacitance		2900		pF	$V_{GS}=0V, V_{DS}=1000V, f=1MHz, V_{AC}=25mV$	Fig. 9
$C_{oss}$	Output Capacitance		118				
$C_{rss}$	Reverse Transfer Capacitance		11.6				
$E_{ON}$	Turn-On Switching Energy		1.20		mJ	$V_{DS}=800V, V_{GS}=-5/18V, I_D=33A, R_{G(ext)}=5\Omega, L=80\mu H$	
$E_{OFF}$	Turn-Off Switching Energy		0.44				
$t_{d(on)}$	Turn-On Delay Time		60		ns	$V_{DD}=800V, V_{GS}=-5/18V, I_D=33A, R_{G(ext)}=5\Omega, \text{Timing relative to } V_{DS}$	
$t_r$	Rise Time		140				
$t_{d(off)}$	Turn-Off Delay Time		50				
$t_f$	Fall Time		42				
$R_{G(int)}$	Internal Gate Resistance		2.1		$\Omega$	$f=1MHz, V_{AC}=25mV$	
$Q_{gs}$	Gate to Source Charge		40		nC	$V_{DD}=800V, V_{GS}=-5/18V, I_D=33A$	Fig. 10
$Q_{gd}$	Gate to Drain Charge		37				
$Q_g$	Total Gate Charge		128				

**Reverse Diode Characteristics**

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
$V_{SD}$	Diode Forward Voltage	3.6		V	$V_{GS}=-5V, I_{SD}=20A, T_J=25^\circ C$	Fig. 7
		3.3		V	$V_{GS}=-5V, I_{SD}=20A, T_J=150^\circ C$	Fig. 8
$I_S$	Continuous Diode Forward Current		60	A	$T_C=25^\circ C$	
$t_{rr}$	Reverse Recovery time	37		ns	$V_{GS}=-5V, I_{SD}=33A, V_R=800V, dif/dt=1200A/\mu s;$	
$Q_{rr}$	Reverse Recovery Charge	165		nC		
$I_{rrm}$	Peak Reverse Recovery Current	16		A		

**Thermal Characteristics**

Symbol	Parameter	Typ.	Unit	Test Conditions	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.48	$^\circ C/W$		Fig. 12
$R_{\theta JA}$	Thermal Resistance From Junction to Ambient	42			

### Typical Performance

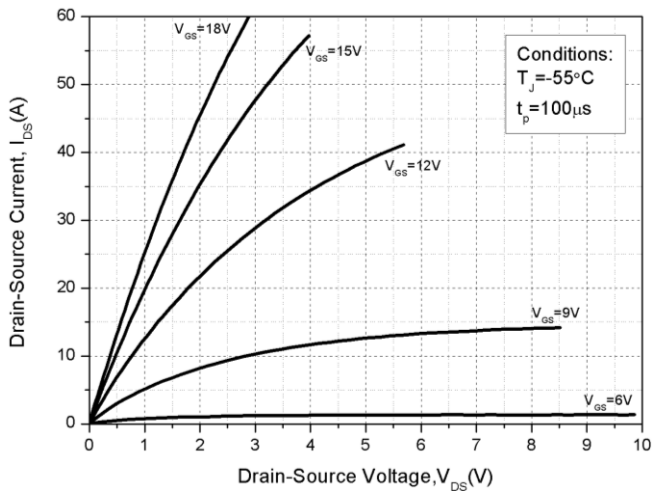


Figure 1. Output Characteristics  $T_j = -55\text{ }^\circ\text{C}$

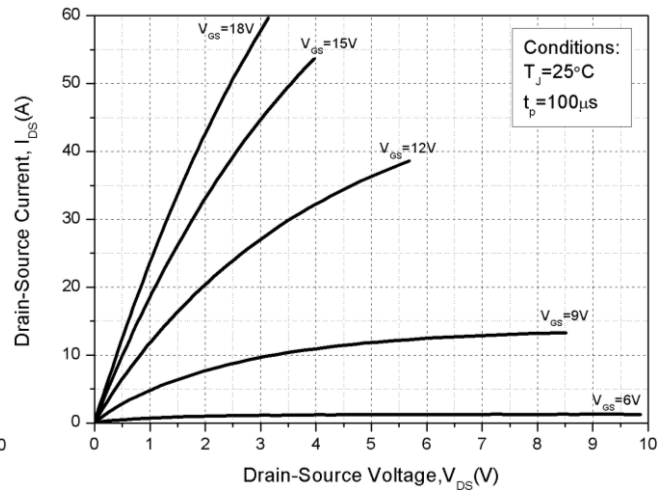


Figure 2. Output Characteristics  $T_j = 25\text{ }^\circ\text{C}$

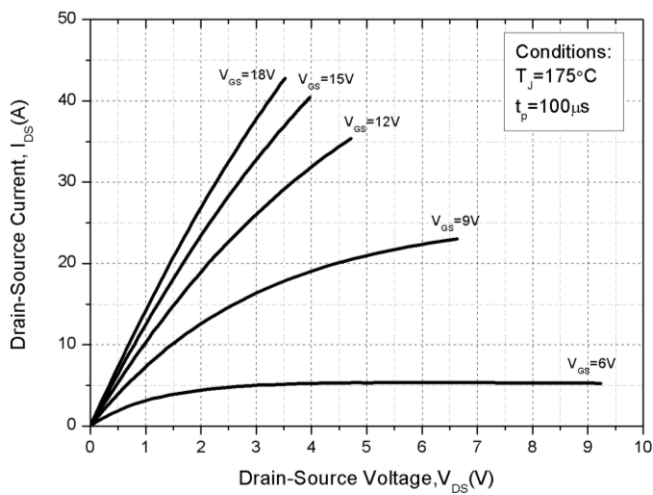


Figure 3. Output Characteristics  $T_j = 150\text{ }^\circ\text{C}$

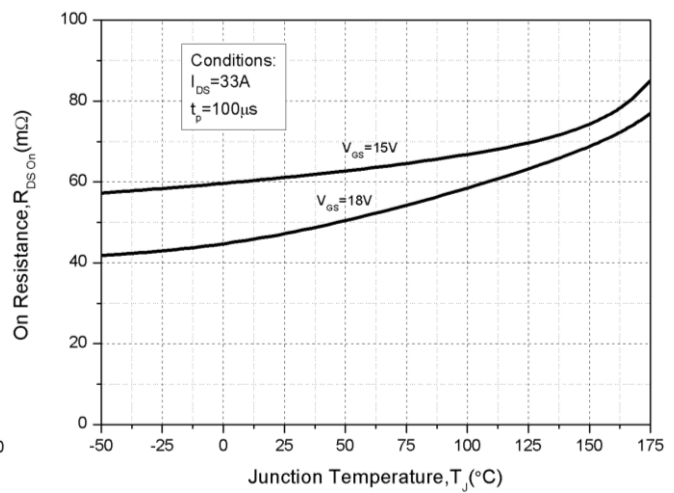


Figure 4. On-Resistance For Various Gate Voltage

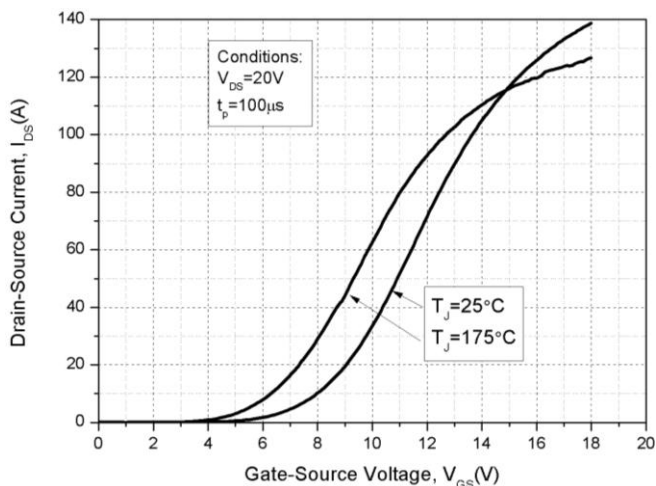


Figure 5. Transfer Characteristic for Various Junction Temperatures

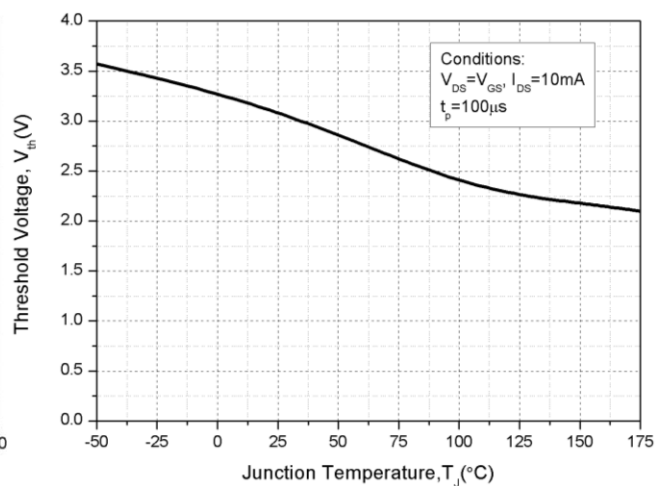


Figure 6. Threshold Voltage vs. Temperature

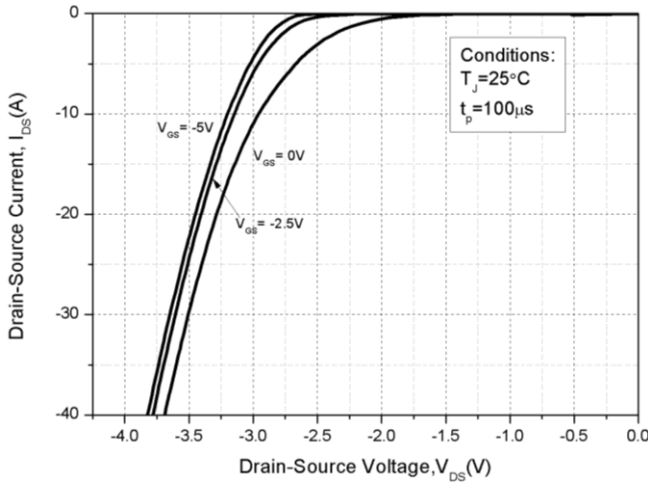


Figure 7. Body Diode Characteristics

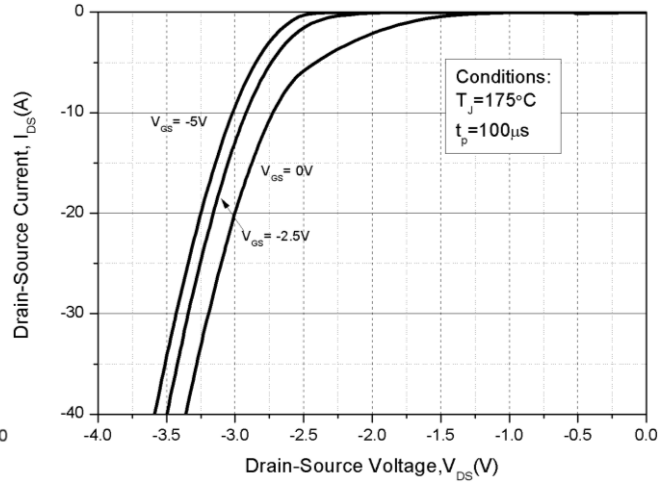


Figure 8. Body Diode Characteristics

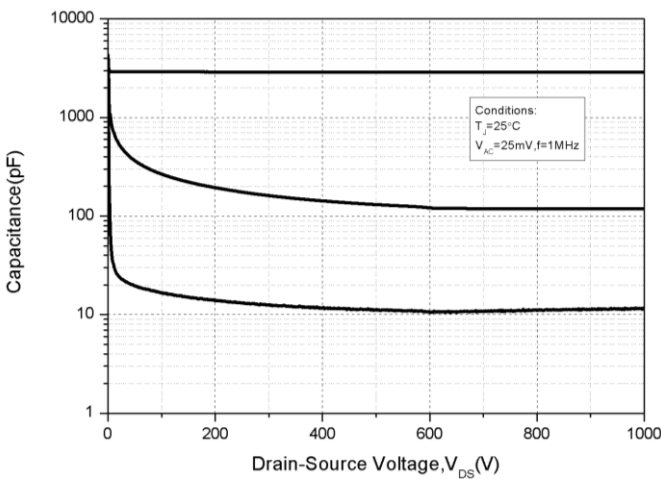


Figure 9. Capacitances vs. Drain-Source Voltage

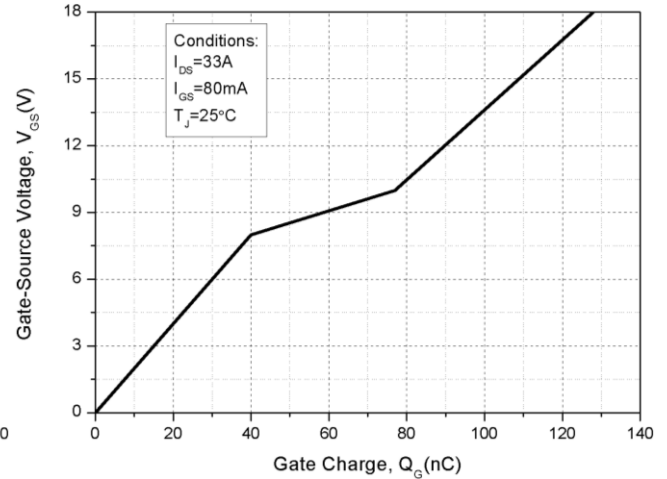


Figure 10. Gate Charge Characteristics

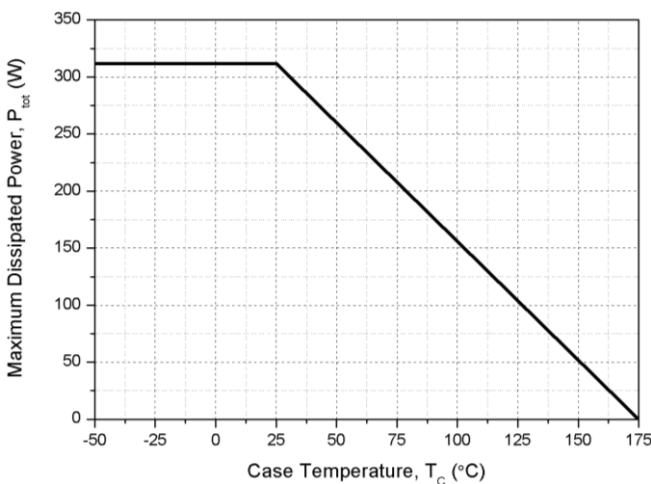


Figure 11. Power Dissipation Derating

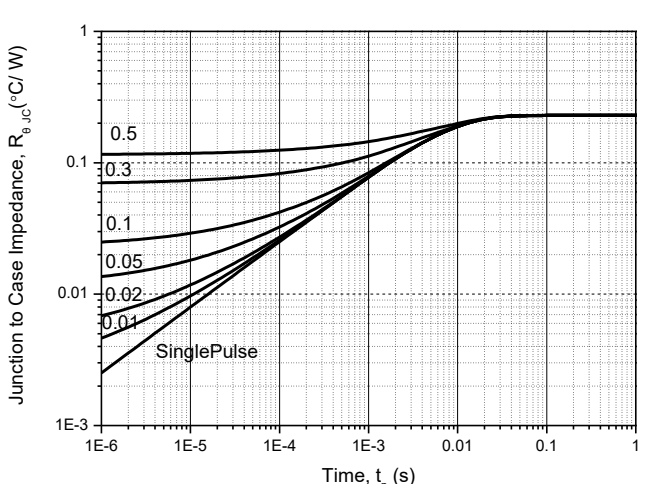
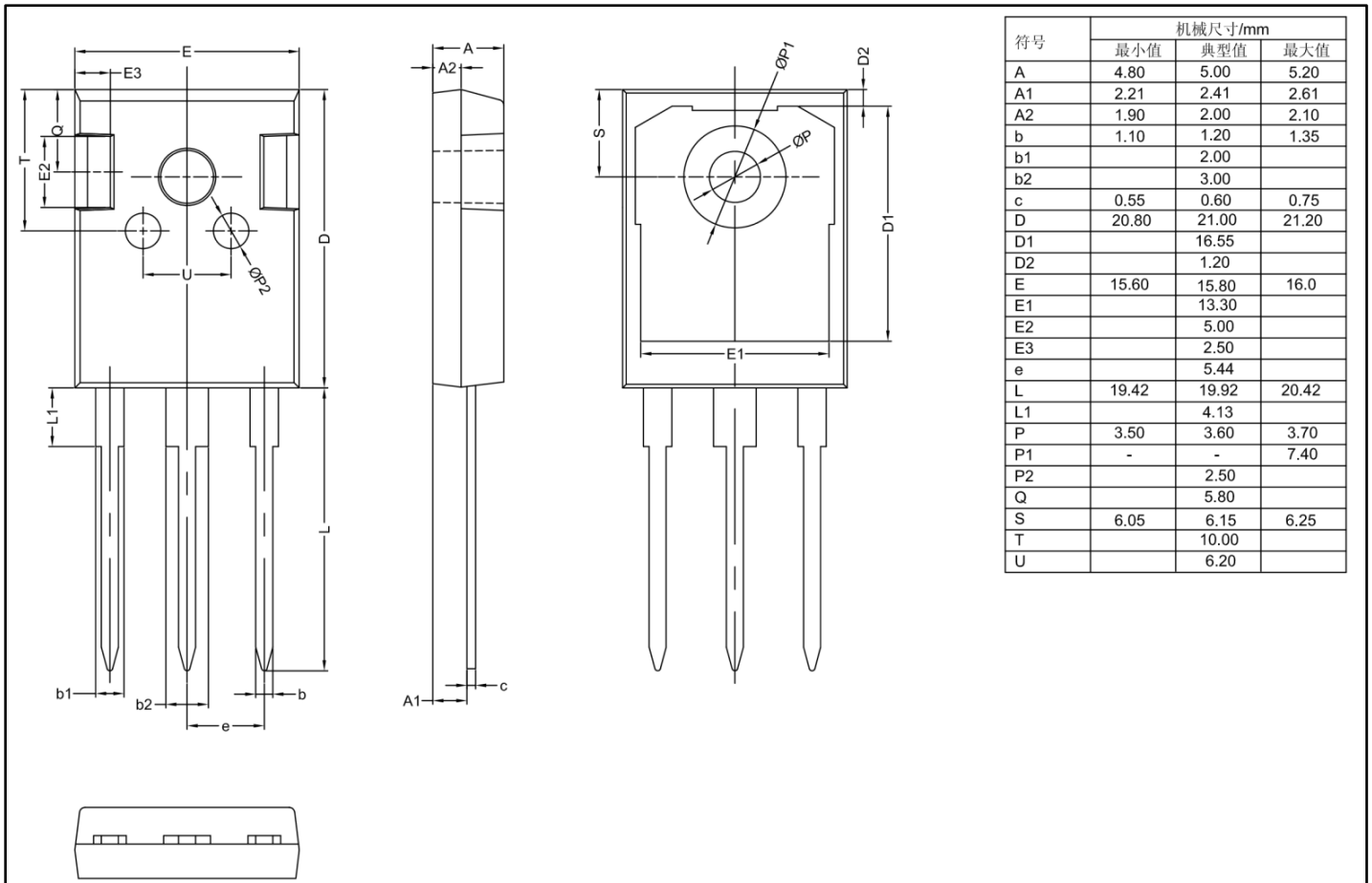


Figure 12. Transient Thermal Impedance

### 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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