

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D@25^{\circ}C$
1200V	196mΩ@20V	18A

### Feature

- High Blocking Voltage With Low On-Resistance
- High Speed Switching With Low Capacitance
- Easy to Parallel and Simple to Drive

### Application

- Power Supplies
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Motor Drivers
- Pulsed Power Applications

### Package



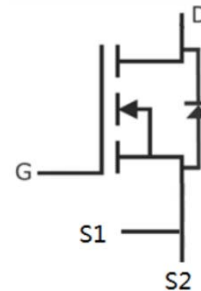
TO-247-4

### Marking



D S2 S1 G

### Circuit diagram



### Absolute maximum ratings ( $T_C=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Test Condition	Value	Unit
Drain-Source Voltage	$V_{DSmax}$	$V_{GS} = 0V, I_{DS} = 100\mu A$	1200	V
Gate-Source Voltage	$V_{GSmax}$	Absolute maximum values	-10/+25	V
Gate-Source Voltage	$V_{GSOP}$	Recommended operational values	-5/+20	V
Continuous Drain Current	$I_D$	$V_{GS} = 20V, T_C = 25^{\circ}C$	18	A
	$I_D$	$V_{GS} = 20V, T_C = 100^{\circ}C$	12	A
Pulsed Drain Current	$I_{DM}$	Pulse width $t_p$ limited by $T_{jmax}$	40	A
Power Dissipation	$P_D$	$T_C = 25^{\circ}C, T_J = 150^{\circ}C$	125	W
Thermal Resistance	$R_{\theta JC}$	Junction-to-Case	0.9	$^{\circ}C/W$
Thermal Resistance	$R_{\theta JA}$	Junction-to-Ambient	40	$^{\circ}C/W$
Junction Temperature	$T_J$		-55 ~ +150	$^{\circ}C$
Storage Temperature	$T_{STG}$		-55 ~ +150	$^{\circ}C$

### Electrical characteristics (T<sub>c</sub>=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>DS</sub> = 100μA	1200			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 1200V, V <sub>GS</sub> = 0V			100	μA
Gate-Source leakage current	I <sub>GSS+</sub>	V <sub>GS</sub> = 25V, V <sub>DS</sub> = 0V			250	nA
Gate-Source leakage current	I <sub>GSS-</sub>	V <sub>GS</sub> = -10V, V <sub>DS</sub> = 0V			250	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>DS</sub> = 2.5mA	2.0	2.4	4.0	V
		V <sub>DS</sub> = V <sub>GS</sub> , I <sub>DS</sub> = 2.5mA, T <sub>J</sub> = 150°C		1.8		
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 20V, I <sub>D</sub> = 10A		160	196	mΩ
		V <sub>GS</sub> = 20V, I <sub>D</sub> = 10A, T <sub>J</sub> = 150°C		280		
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 1000V, V <sub>GS</sub> = 0V, f = 1MHz V <sub>AC</sub> = 25mV		890		pF
Output Capacitance	C <sub>oss</sub>			54		
Reverse Transfer Capacitance	C <sub>rss</sub>			8.5		
C <sub>oss</sub> Stored Energy	E <sub>oss</sub>			31		μJ
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 800V, V <sub>GS</sub> = -5V/20V, I <sub>D</sub> = 10A		49		nC
Gate-Source Charge	Q <sub>gs</sub>			17		
Gate-Drain Charge	Q <sub>gd</sub>			9		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DS</sub> = 800V, V <sub>GS</sub> = -5V/20V, I <sub>D</sub> = 10A, R <sub>G(ext)</sub> = 2.5Ω, R <sub>L</sub> = 80Ω		8		nS
Turn-on rise time	t <sub>r</sub>			9		
Turn-off delay time	t <sub>d(off)</sub>			14		
Turn-off fall time	t <sub>f</sub>			9		
Internal Gate Resistance	R <sub>G</sub>	f = 1MHz, V <sub>AC</sub> = 25mV		5.5		Ω
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	I <sub>S</sub>	T <sub>C</sub> = 25°C			23	A
Diode Forward voltage	V <sub>DS</sub>	V <sub>GS</sub> = -5V, I <sub>F</sub> = 5A		4.2		V
		V <sub>GS</sub> = -5V, I <sub>F</sub> = 5A, T <sub>J</sub> = 150°C		3.9		
Reverse Recovery Time	t <sub>rr</sub>	I <sub>SD</sub> = 20A, V <sub>R</sub> = 800V		28		nS
Reverse Recovery Charge	Q <sub>rr</sub>			50		nC
Peak Reverse Recovery Current	I <sub>rrm</sub>				3	

## Typical Characteristics

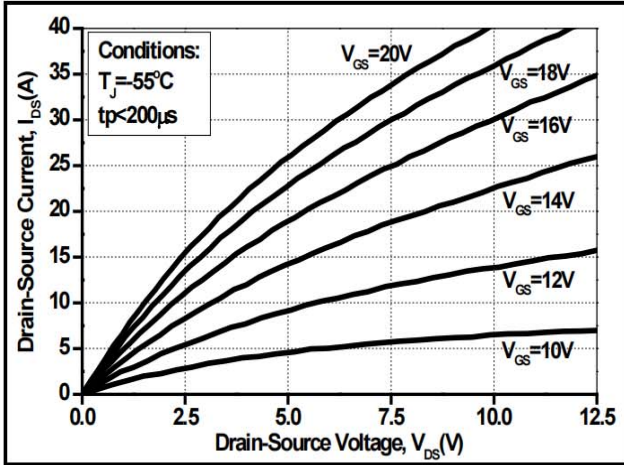


Figure 1. Output Characteristics  $T_j = -55^\circ\text{C}$

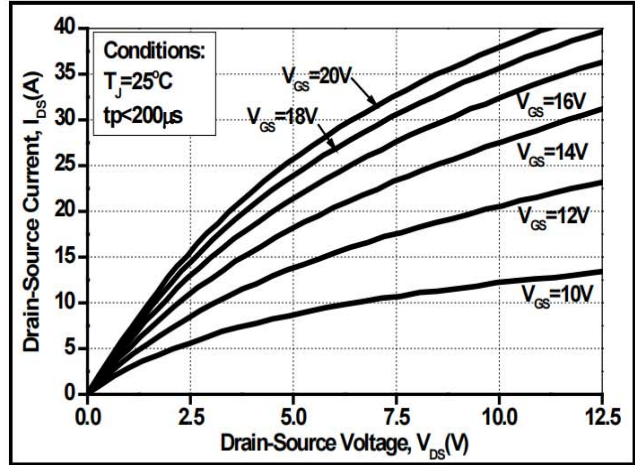


Figure 2. Output Characteristics  $T_j = 25^\circ\text{C}$

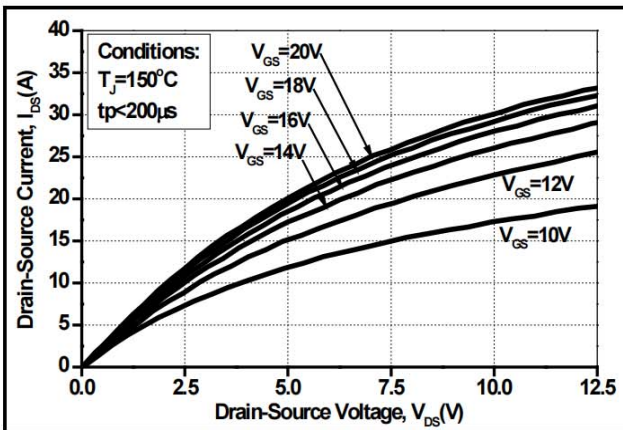


Figure 3. Output Characteristics  $T_j = 150^\circ\text{C}$

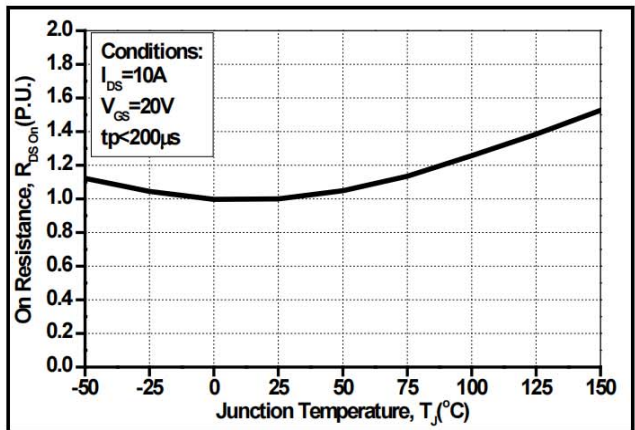


Figure 4. Normalized On-Resistance vs. Temperature

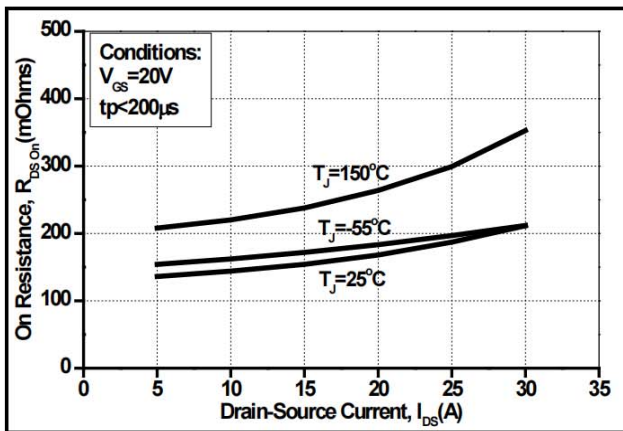


Figure 5. On-Resistance vs. Drain Current  
For Various Temperatures

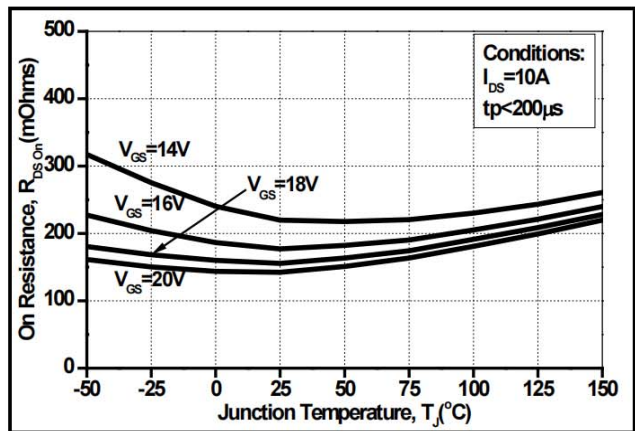


Figure 6. On-Resistance vs. Temperature  
For Various Gate Voltage



## Typical Characteristics

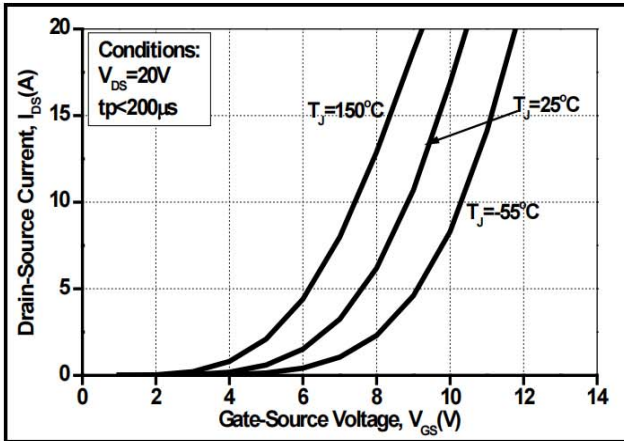


Figure 7. Transfer Characteristic for Various Junction Temperatures

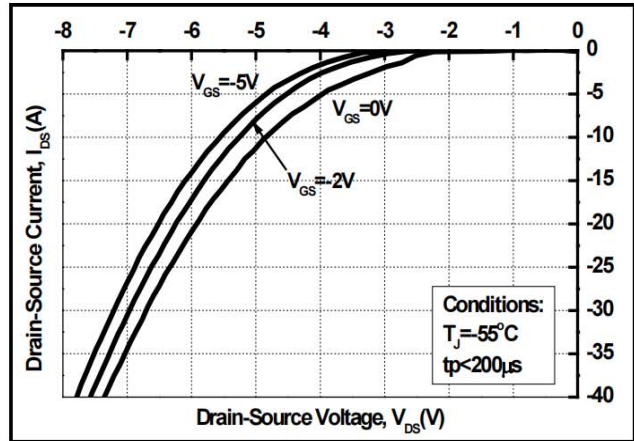


Figure 8. Body Diode Characteristic at -55°C

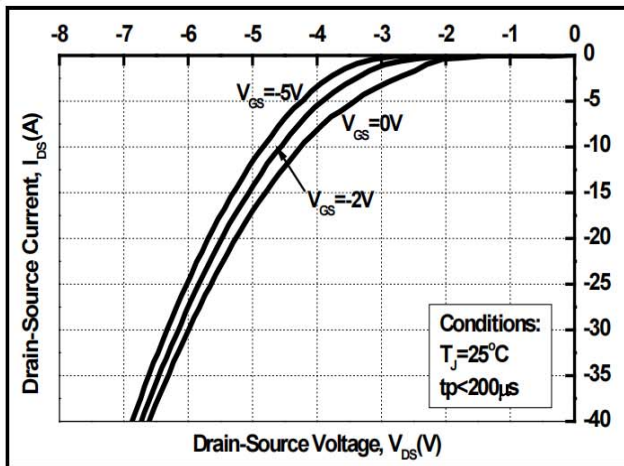


Figure 9. Body Diode Characteristic at 25°C

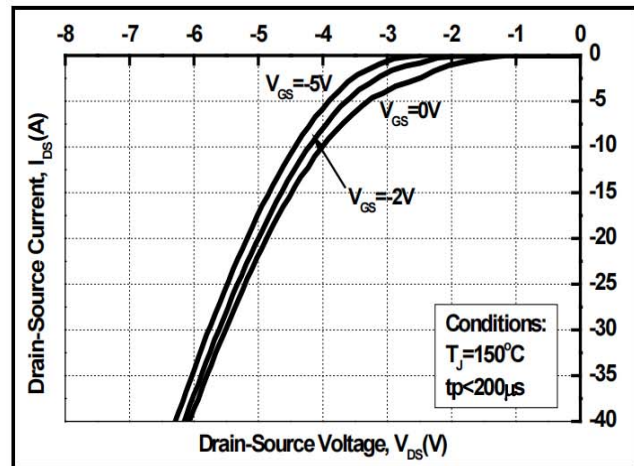


Figure 10. Body Diode Characteristic at 150°C

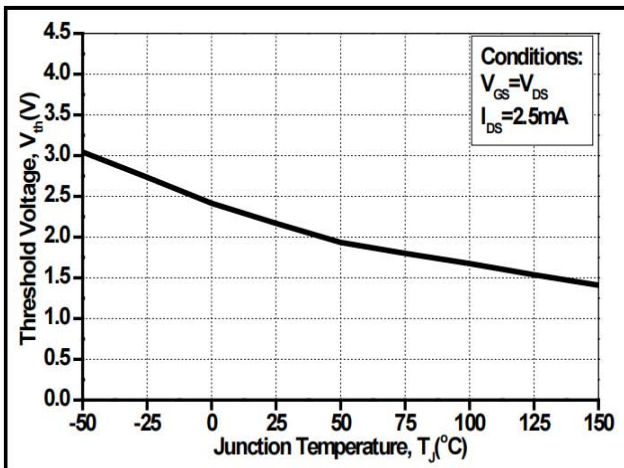


Figure 11. Threshold Voltage vs. Temperature

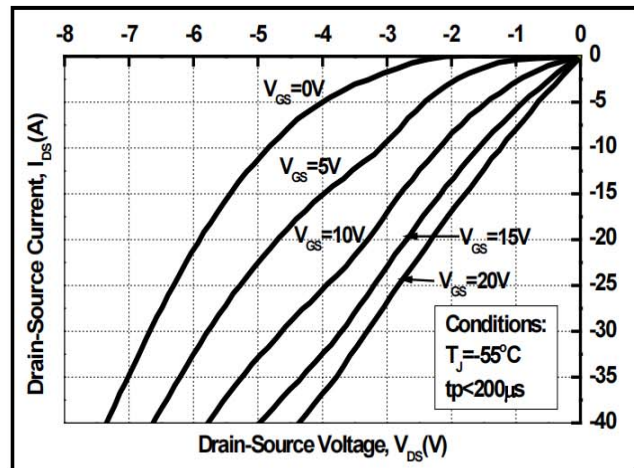


Figure 12. 3rd Quadrant Characteristic at -55°C

## Typical Characteristics

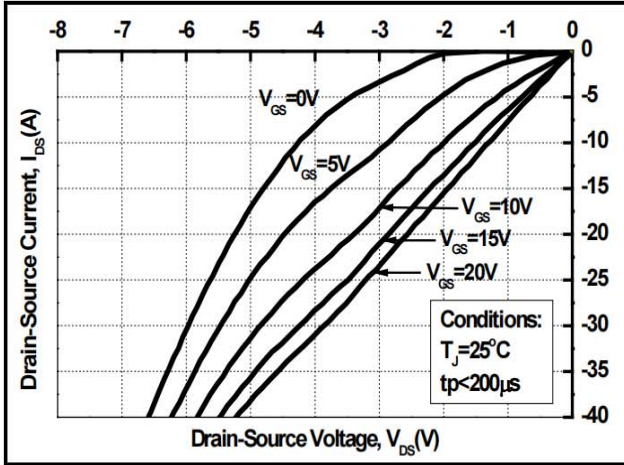


Figure 13. 3rd Quadrant Characteristic at 25°C

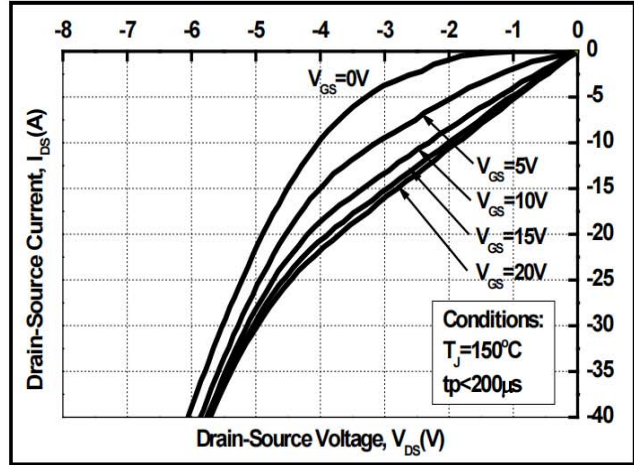


Figure 14. 3rd Quadrant Characteristic at 150°C

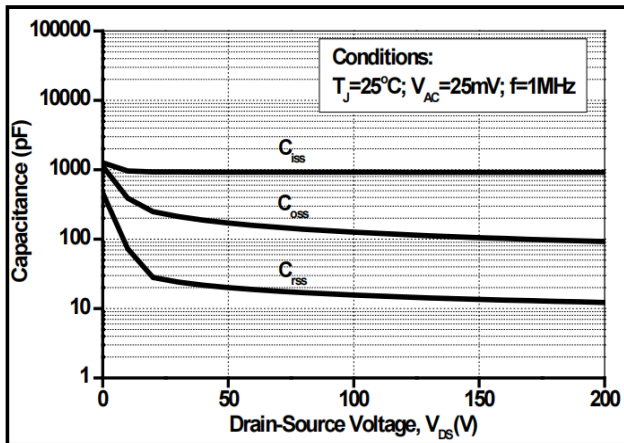


Figure 15. Capacitances vs. Drain-Source Voltage (0 - 200V)

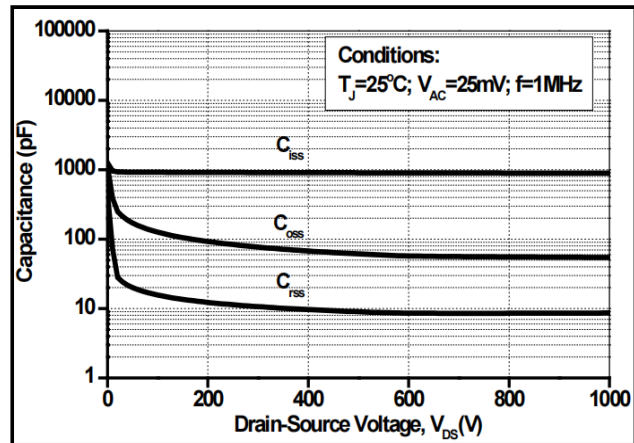
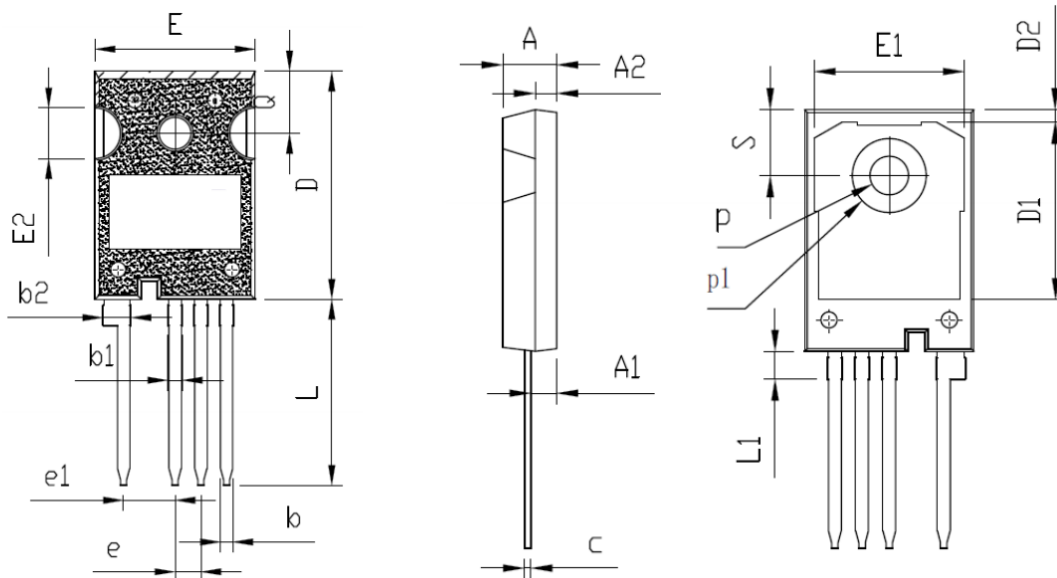


Figure 16. Capacitances vs. Drain-Source Voltage (0 - 1000V)

### TO-247-4 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.800	5.250	0.189	0.207
A1	2.250	2.550	0.089	0.100
A2	1.900	2.200	0.075	0.087
b	1.050	1.350	0.041	0.053
b1	1.050	1.600	0.041	0.063
b2	2.350	2.950	0.093	0.116
c	0.550	0.700	0.022	0.028
D	23.200	23.800	0.913	0.937
D1	16.250	17.650	0.640	0.695
D2	0.950	1.250	0.037	0.049
E	15.700	16.200	0.618	0.638
E1	13.000	14.200	0.512	0.559
E2	3.650	5.200	0.144	0.205
L	17.300	19.850	0.681	0.781
L1	3.950	4.450	0.156	0.175
Q	5.450	6.300	0.215	0.248
S	6.000	6.300	0.236	0.248
P	3.500	3.650	0.138	0.144
P1	7.180 BSC		0.283 BSC	
e	2.540 BSC		0.100 BSC	
e1	5.080 BSC		0.2000 BSC	