

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D@25^{\circ}C$
1200V	53mΩ@18V	68A

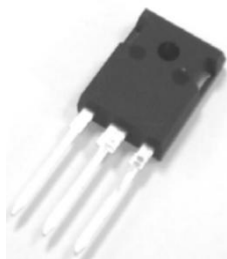
Feature

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

Application

- Renewable Energy
- High Voltage DC/DC Converters
- Switch Mode Power Supplies
- EV Battery Chargers

Package

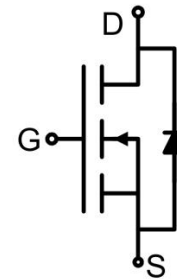


TO-247-3

Marking



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	-8/+22	V
Gate-Source Voltage	V_{GSOP}	Recommended operational values	-4/+18	V
Continuous Drain Current	I_D	$V_{GS} = 18V, T_C=25^{\circ}C$	68	A
	I_D	$V_{GS} = 18V, T_C=100^{\circ}C$	49	A
Pulsed Drain Current	$I_{D(pulse)}$	Pulse width t_p limited by T_{jmax}	100	A
Power Dissipation	P_D	$T_C=25^{\circ}C, T_j=175^{\circ}C$	340	W
Thermal Resistance	$R_{\theta JC}$	Junction-to-Case (Typ.)	0.44	$^{\circ}C/W$
Thermal Resistance	$R_{\theta JA}$	Junction-to-Ambient	40	$^{\circ}C/W$
Junction Temperature	T_J		-55 ~ +175	$^{\circ}C$
Storage Temperature	T_{STG}		-55 ~ +175	$^{\circ}C$

Electrical characteristics (T_C=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _{DS} = 100uA	1200			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 1200V, V _{GS} = 0V			100	μA
Gate-Source leakage current	I _{GSS+}	V _{GS} = 22V, V _{DS} = 0V			250	nA
Gate-Source leakage current	I _{GSS-}	V _{GS} = -8V, V _{DS} = 0V			250	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = 9.5mA	1.9	2.6	4.0	V
		V _{DS} = V _{GS} , I _{DS} = 9.5mA, T _J = 175°C		1.8		
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 18V, I _D = 33.3A		40	53	mΩ
		V _{GS} = 18V, I _D = 33.3A, T _J = 175°C		65		
Transconductance	g _{fs}	V _{DS} = 20V, I _D = 33.3A		21		S
		V _{DS} = 20V, I _D = 33.3A, T _J = 175°C		17.5		
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} = 1000V, V _{GS} = 0V, f = 1MHz V _{AC} = 25mV		2070		pF
Output Capacitance	C _{oss}			112		
Reverse Transfer Capacitance	C _{rss}			11		
C _{oss} Stored Energy	E _{oss}			66		
Turn-on Switching Energy	E _{on}	V _{DS} = 800V, V _{GS} = -4V/18V, I _D = 33A, R _{G(ext)} = 2.5Ω, L = 100μH		1410		μJ
Turn-off Switching Energy	E _{off}			750		
Total Gate Charge	Q _g	V _{DS} = 800V, V _{GS} = -4V/18V, I _D = 33A		121		nC
Gate-Source Charge	Q _{gs}			34		
Gate-Drain Charge	Q _{gd}			20		
Turn-on delay time	t _{d(on)}	V _{DS} = 800V, V _{GS} = -4V/18V, I _D = 33A, R _{G(ext)} = 2.5Ω, R _L = 20Ω		17		nS
Turn-on rise time	t _r			58		
Turn-off delay time	t _{d(off)}			26		
Turn-off fall time	t _f			15		
Internal Gate Resistance	R _G	f = 1MHz V _{AC} = 25mV		4.9		Ω
Source-Drain Diode characteristics						
Diode Forward Current	I _S	T _C = 25°C			51	A
Diode Forward voltage	V _{SD}	V _{GS} = -4V, I _{SD} = 10A		4.5		V
		V _{GS} = -4V, I _{SD} = 10A, T _J = 175°C		4.2		
Reverse Recovery Time	t _{rr}	I _{SD} = 20A, V _R = 800V		38		nS
Reverse Recovery Charge	Q _{rr}			109		nC
Peak Reverse Recovery Current	I _{rrm}			5		A

Typical Characteristics

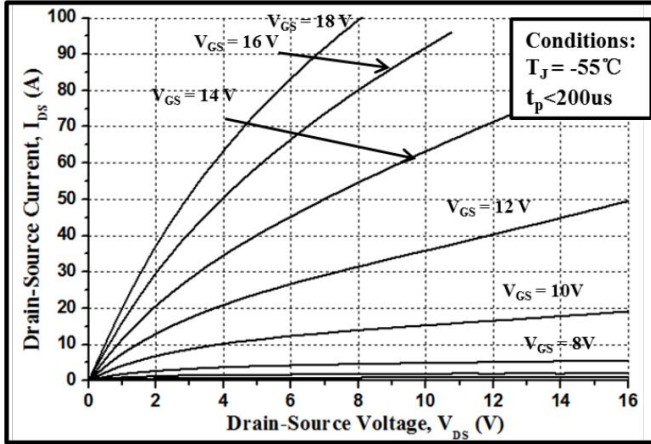


Figure 1. Output Characteristics $T_J = -55^\circ\text{C}$

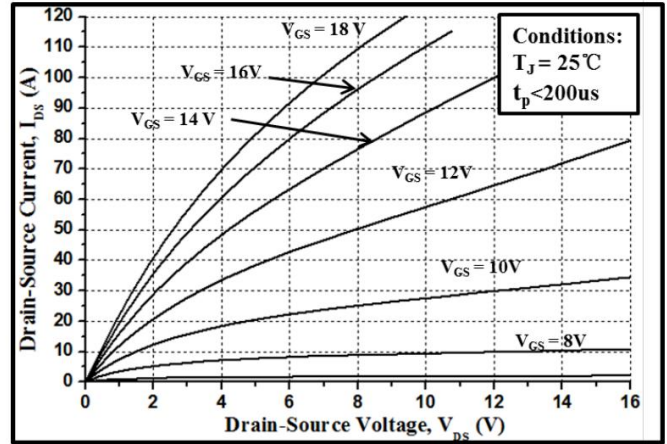


Figure 2. Output Characteristics $T_J = 25^\circ\text{C}$

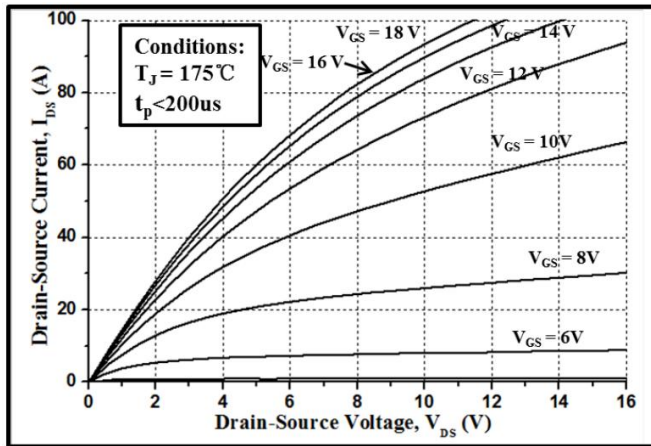


Figure 3. Output Characteristics $T_J = 175^\circ\text{C}$

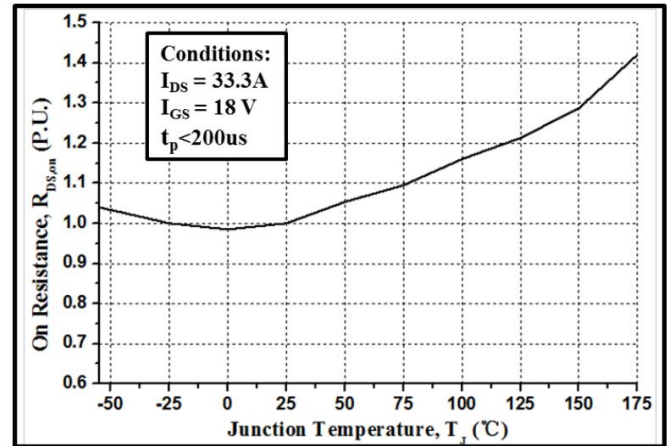


Figure 4. Normalized On-Resistance vs. Temperature

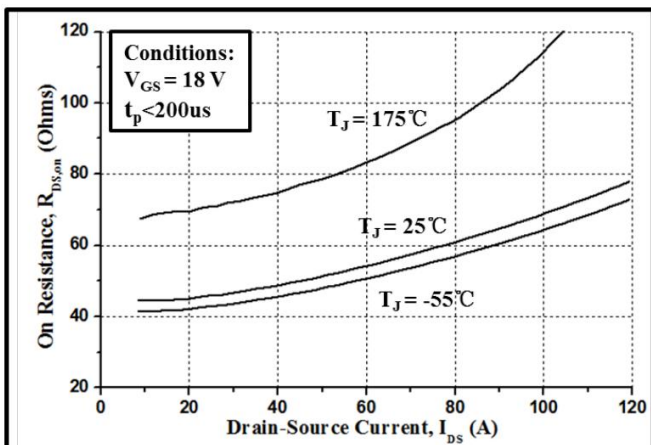


Figure 5. On-Resistance vs. Drain Current
For Various Temperatures

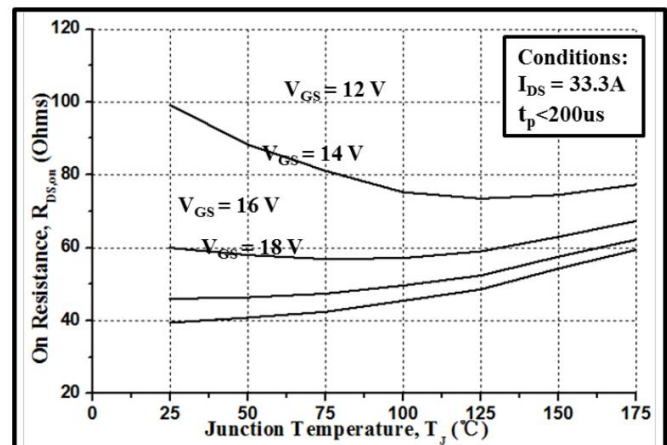


Figure 6. On-Resistance vs. Temperature
For Various Gate Voltage

Typical Characteristics

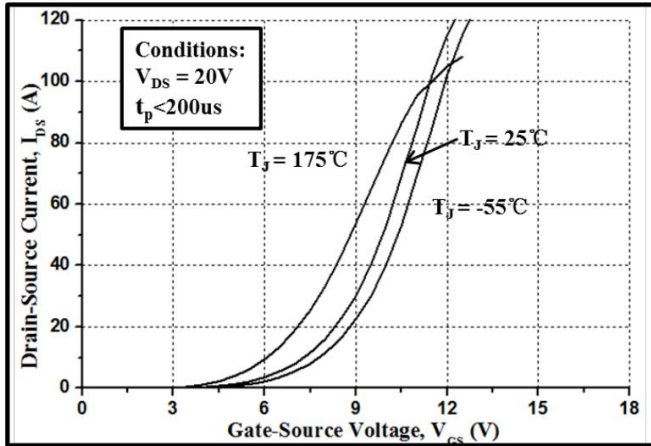


Figure 7. Transfer Characteristic for Various Junction Temperatures

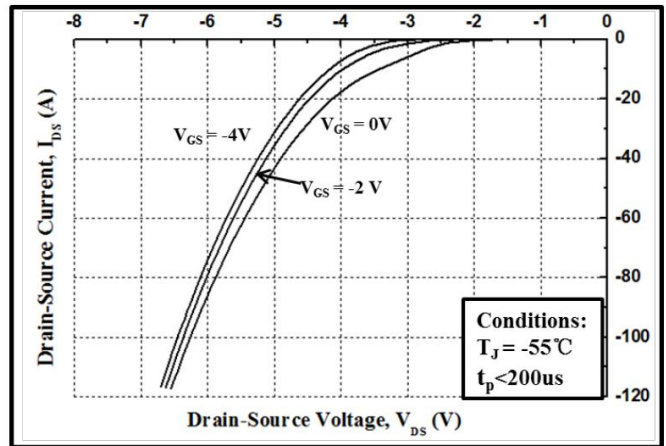


Figure 8. Body Diode Characteristic at -55°C

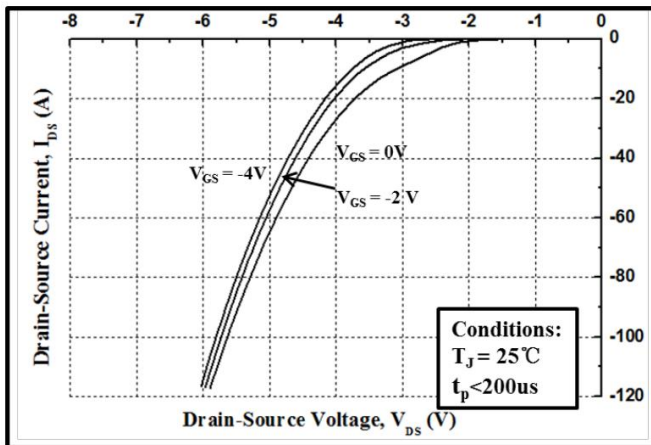


Figure 9. Body Diode Characteristic at 25°C

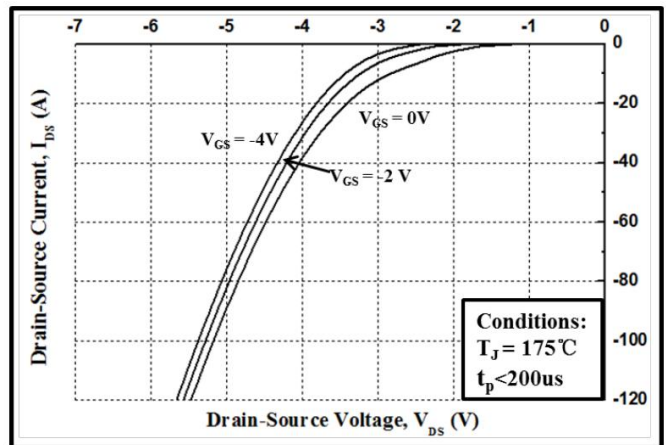


Figure 10. Body Diode Characteristic at 175°C

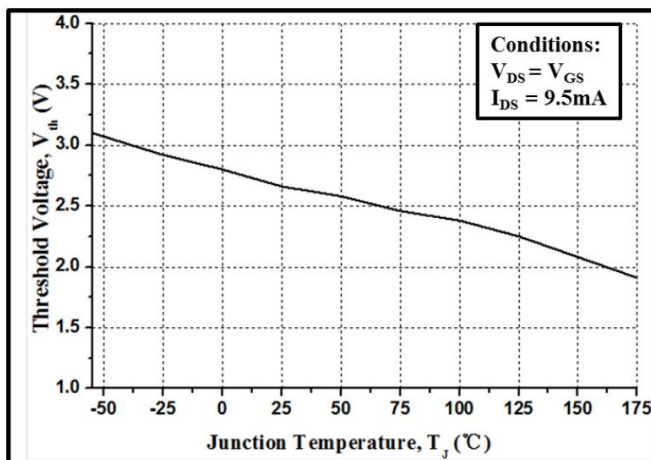


Figure 11. Threshold Voltage vs. Temperature

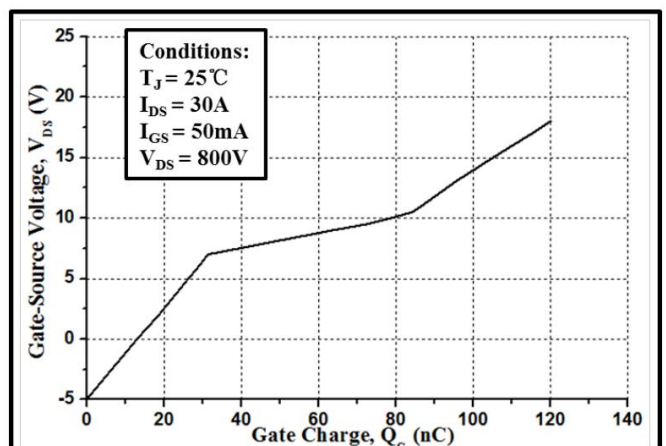


Figure 12. Gate Charge Characteristics

Typical Characteristics

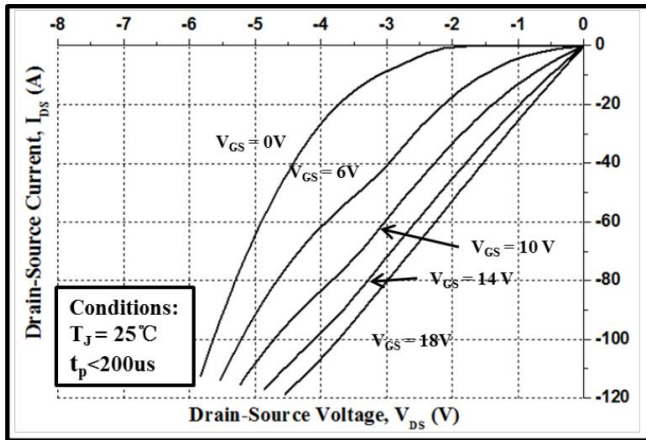


Figure 13. 3rd Quadrant Characteristic at 25°C

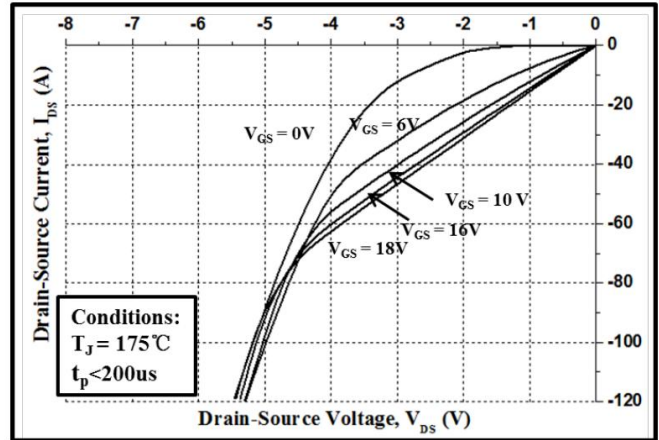


Figure 14. 3rd Quadrant Characteristic at 175°C

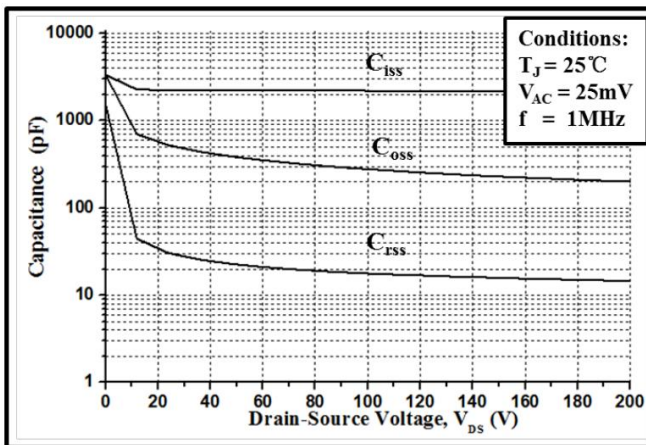


Figure 15. Capacitances vs. Drain-Source Voltage (0 - 200V)

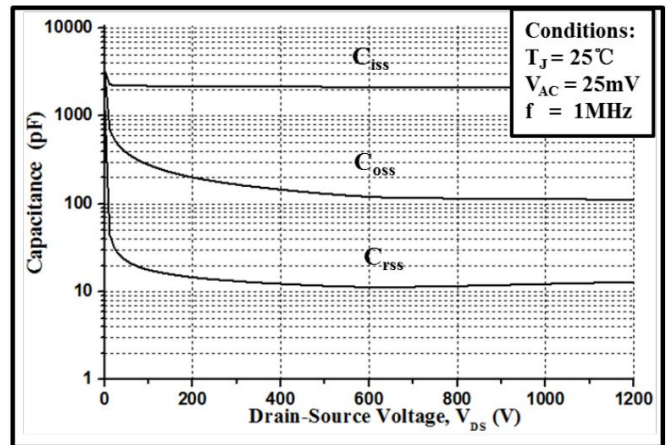
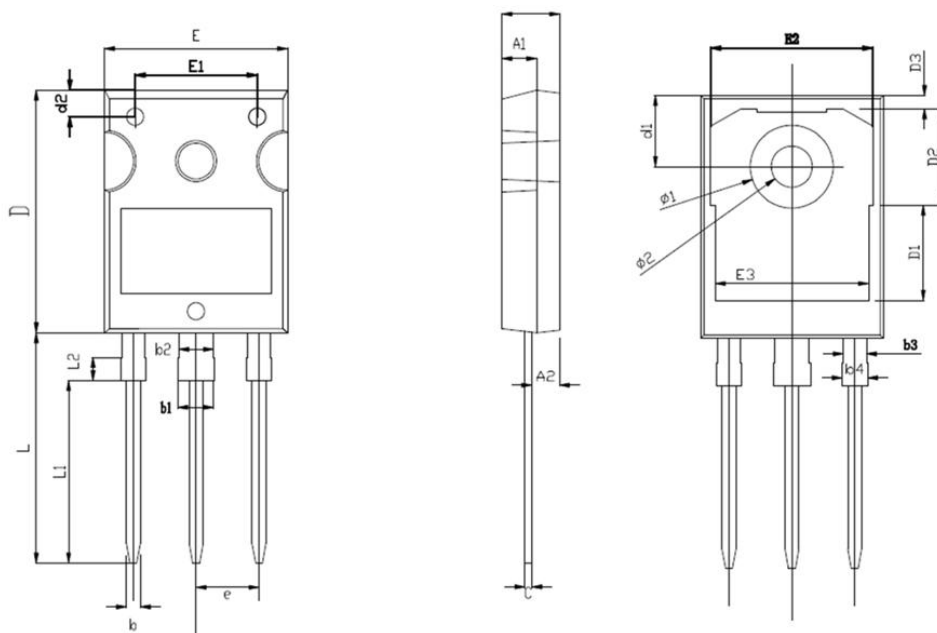


Figure 16. Capacitances vs. Drain-Source Voltage (0 - 1200V)

TO-247-3 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.800	5.250	0.189	0.207
A1	2.800	3.200	0.110	0.126
A2	2.260	2.560	0.088	0.100
b	1.050	1.350	0.041	0.053
b1	2.850	3.400	0.112	0.134
b2	2.900	3.100	0.114	0.122
b3	1.900	2.420	0.075	0.095
b4	2.000	2.200	0.078	0.087
c	0.500	0.700	0.019	0.028
D	20.800	21.200	0.818	0.835
D1	8.230 TYP.		0.324 TYP.	
D2	8.320 TYP.		0.327 TYP.	
D3	1.170 TYP.		0.046 TYP.	
E	15.600	16.000	0.614	0.630
E1	10.500 TYP.		0.413 TYP.	
E2	14.020 TYP.		0.552 TYP.	
E3	13.500 TYP.		0.531 TYP.	
L	19.720	20.350	0.776	0.801
L1	15.790 TYP.		0.622 TYP.	
L2	1.980 TYP.		0.078 TYP.	
Φ1	7.180 TYP.		0.283 TYP.	
Φ2	3.600 TYP.		0.142 TYP.	
e	5.440 TYP.		0.214 TYP.	

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