

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D@25^{\circ}C$
1200V	34mΩ@20V	90A

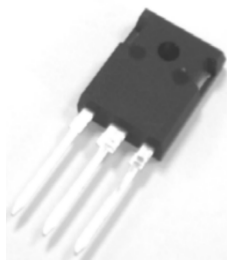
Feature

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

Application

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

Package

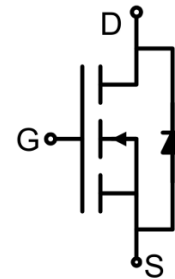


TO-247-3

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	-10/+25	V
Gate-Source Voltage	V_{GSOP}	Recommended operational values	-5/+20	V
Continuous Drain Current	I_D	$V_{GS} = 20V, T_C=25^{\circ}C$	90	A
	I_D	$V_{GS} = 20V, T_C=100^{\circ}C$	60	A
Pulsed Drain Current	I_{DM}	Pulse width t_p limited by T_{jmax}	250	A
Power Dissipation	P_D	$T_C=25^{\circ}C, T_J=150^{\circ}C$	463	W
Thermal Resistance	$R_{\theta JC}$	Junction-to-Case	0.28	$^{\circ}C/W$
Junction Temperature	T_J		-55 ~ +150	$^{\circ}C$
Storage Temperature	T_{STG}		-55 ~ +150	$^{\circ}C$

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} = 100μA	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} = 20V, V _{DS} = 0V			250	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = 15mA	2.0		4.0	V
		V _{DS} = V _{GS} , I _{DS} = 15mA, T _J = 150°C		1.8		
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 20V, I _D = 50A		25	34	mΩ
		V _{GS} = 20V, I _D = 50A, T _J = 150°C		43		
Transconductance	g _{fs}	V _{DS} = 20V, I _D = 50A		22.8		S
		V _{DS} = 20V, I _D = 50A, T _J = 150°C		21.2		
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} = 1000V, V _{GS} = 0V, f = 1MHz V _{AC} = 25mV		3600		pF
Output Capacitance	C _{oss}			240		
Reverse Transfer Capacitance	C _{rss}			16		
C _{oss} Stored Energy	E _{oss}			122		
Turn-on Switching Energy	E _{on}	V _{DS} = 800V, V _{GS} = -5V/20V, I _D = 30A, R _g = 2.5Ω, L = 200μH		1.8		μJ
Turn-off Switching Energy	E _{off}			1.5		
Total Gate Charge	Q _g	V _{DS} = 800V, V _{GS} = -5V/20V, I _D = 30A		195		nC
Gate-Source Charge	Q _{gs}			54		
Gate-Drain Charge	Q _{gd}			29		
Turn-on delay time	t _{d(on)}	V _{DS} = 800V, V _{GS} = -5V/20V, I _D = 30A, R _g = 2.5Ω, R _L = 2.5Ω		16		nS
Turn-on rise time	t _r			16.2		
Turn-off delay time	t _{d(off)}			33		
Turn-off fall time	t _f			7.8		
Internal Gate Resistance	R _G	f = 1MHz open drain		2.0		Ω
Source-Drain Diode characteristics						
Diode Forward Current	I _S	T _C = 25°C			90	A
Diode Forward voltage	V _{DS}	V _{GS} = -5V, I _F = 25A		3.6		V
		V _{GS} = -5V, I _F = 25A, T _J = 150°C		3.3		
Reverse Recovery Time	t _{rr}	V _{GS} = -5V, I _{SD} = 25A, V _R = 800V		55		nS
Reverse Recovery Charge	Q _{rr}			320		nC
Peak Reverse Recovery Current	I _{rrm}				10.7	

Typical Characteristics

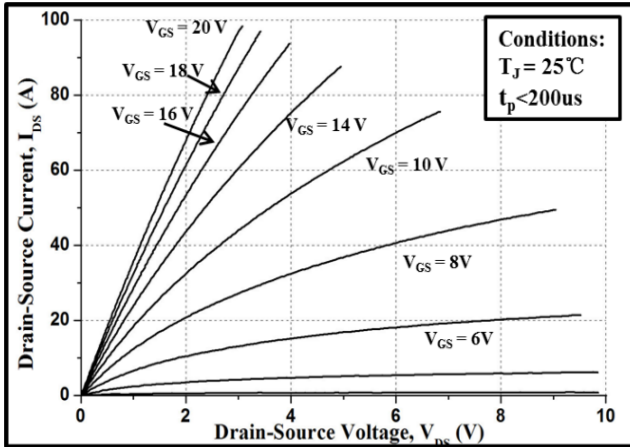


Figure 1. Typical Output Characteristics $T_J = 25^\circ\text{C}$

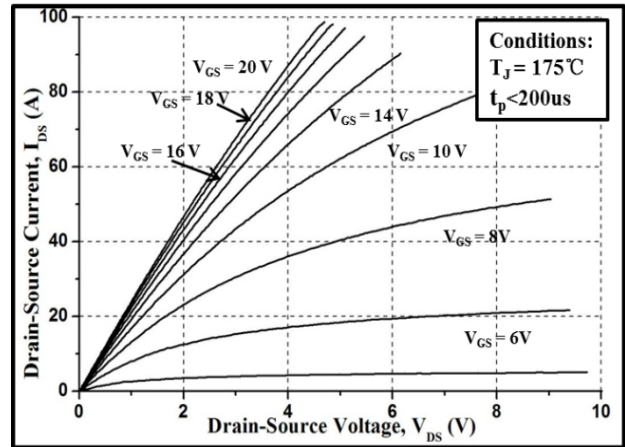


Figure 2. Typical Output Characteristics $T_J = 175^\circ\text{C}$

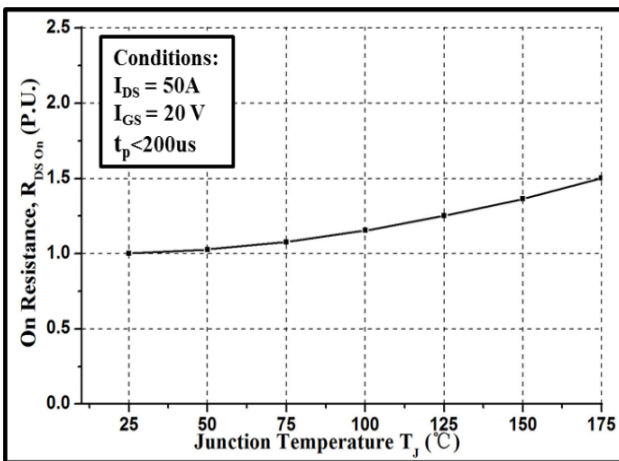


Figure 3. Normalized On-Resistance vs. Temperature

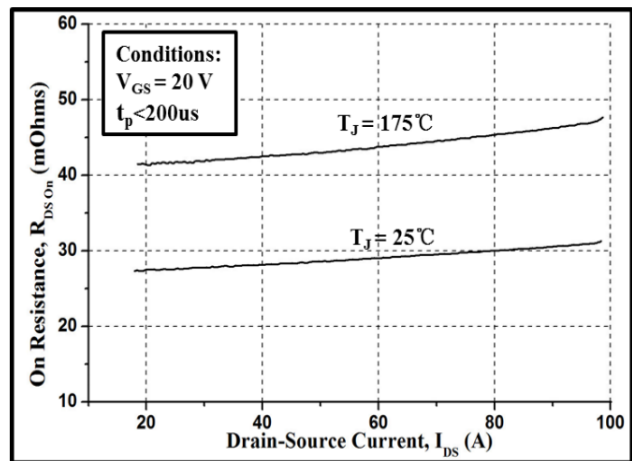


Figure 4. On-Resistance vs. Drain Current

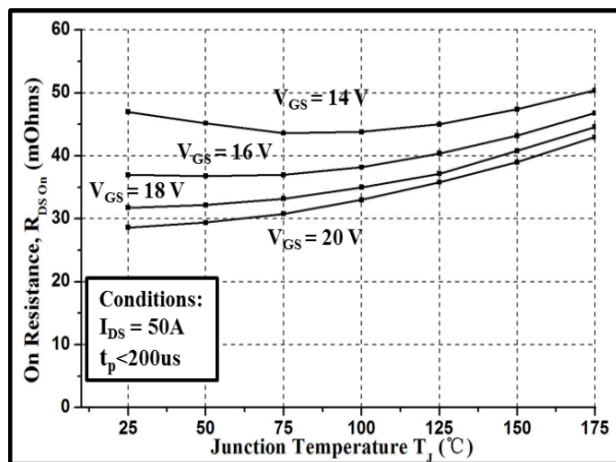


Figure 5. On-Resistance vs. Temperature

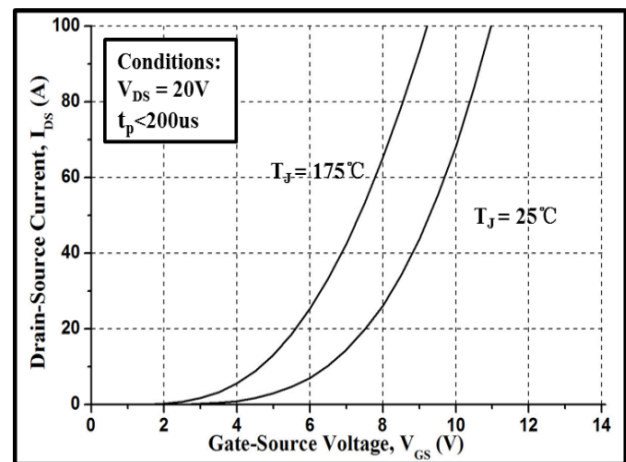


Figure 6. Typical Transfer Characteristics

Typical Characteristics

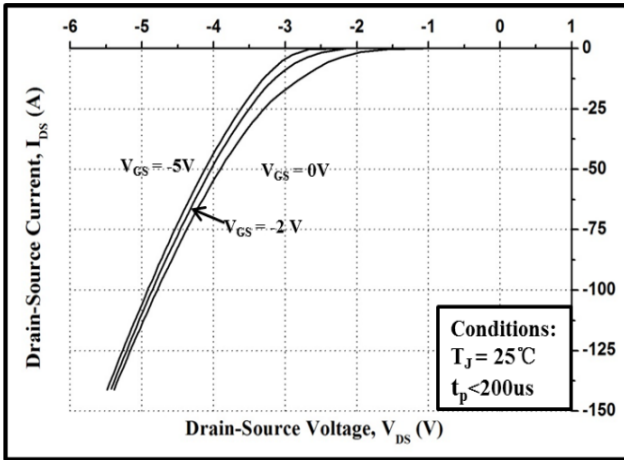


Figure 7. Body Diode Characteristics at 25°C

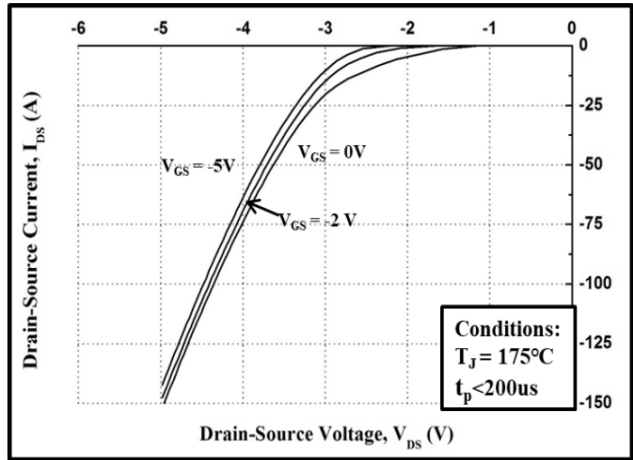


Figure 8. Body Diode Characteristics at 175°C

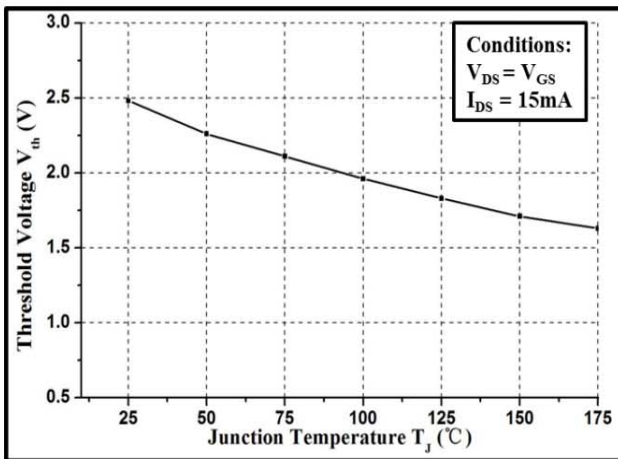


Figure 9. Gate Threshold Voltage vs. Temperature

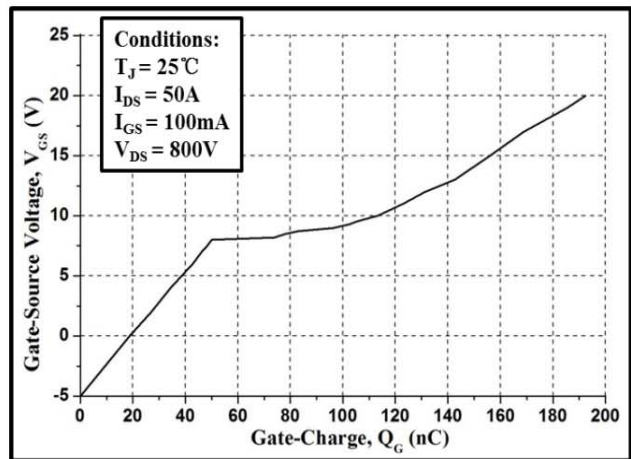


Figure 10. Gate Charge Characteristic

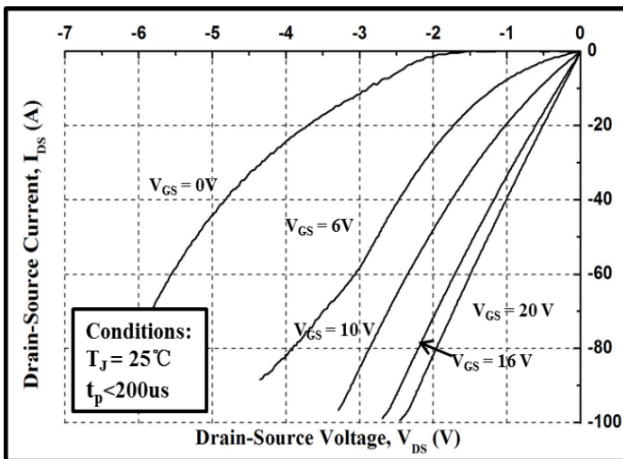


Figure 11. 3rd Quadrant Characteristics at 25° C

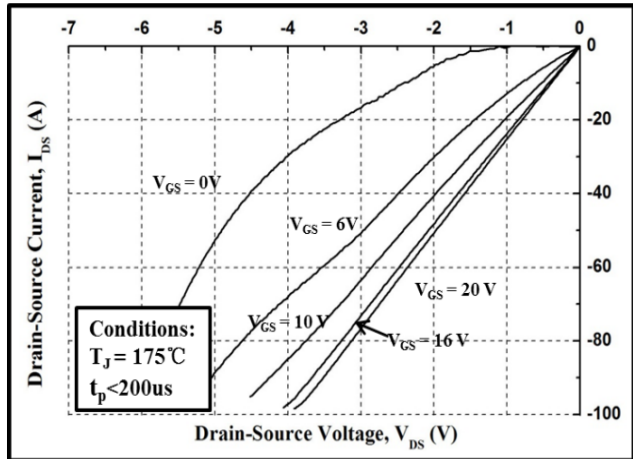


Figure 12. 3rd Quadrant Characteristics at 175° C

Typical Characteristics

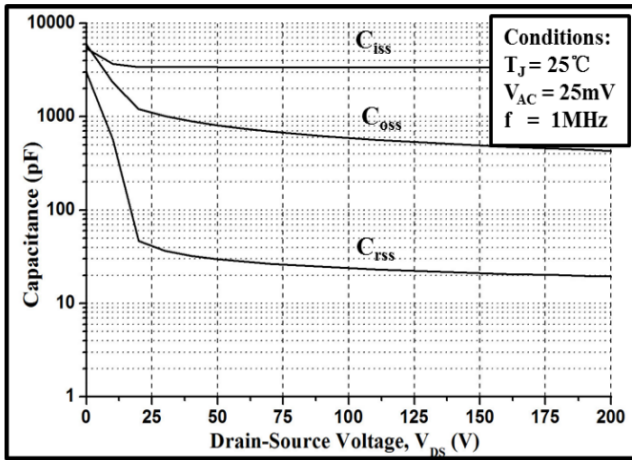


Figure 13. Capacitances vs. Drain-Source Voltage

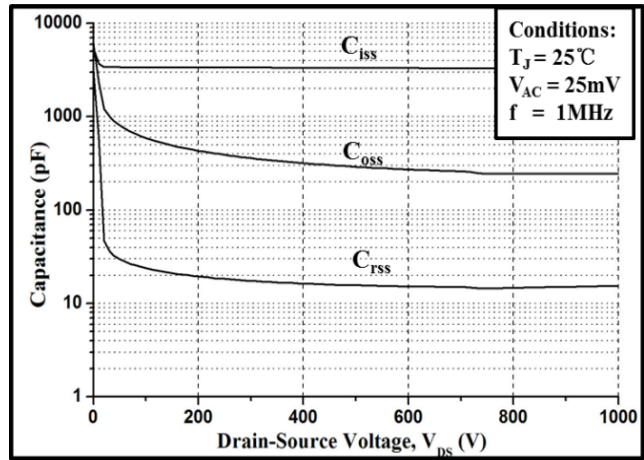


Figure 14. Capacitances vs. Drain-Source Voltage

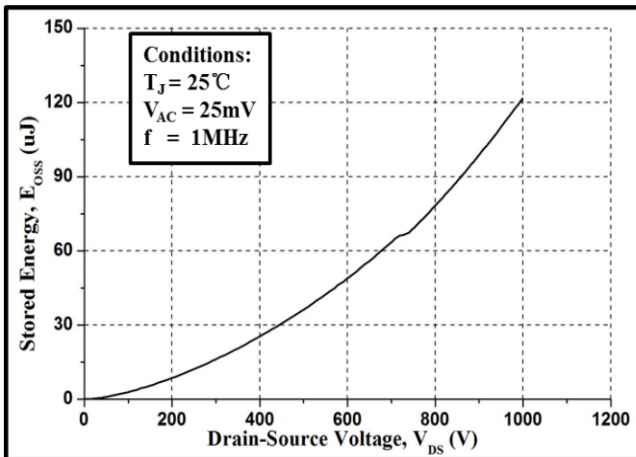
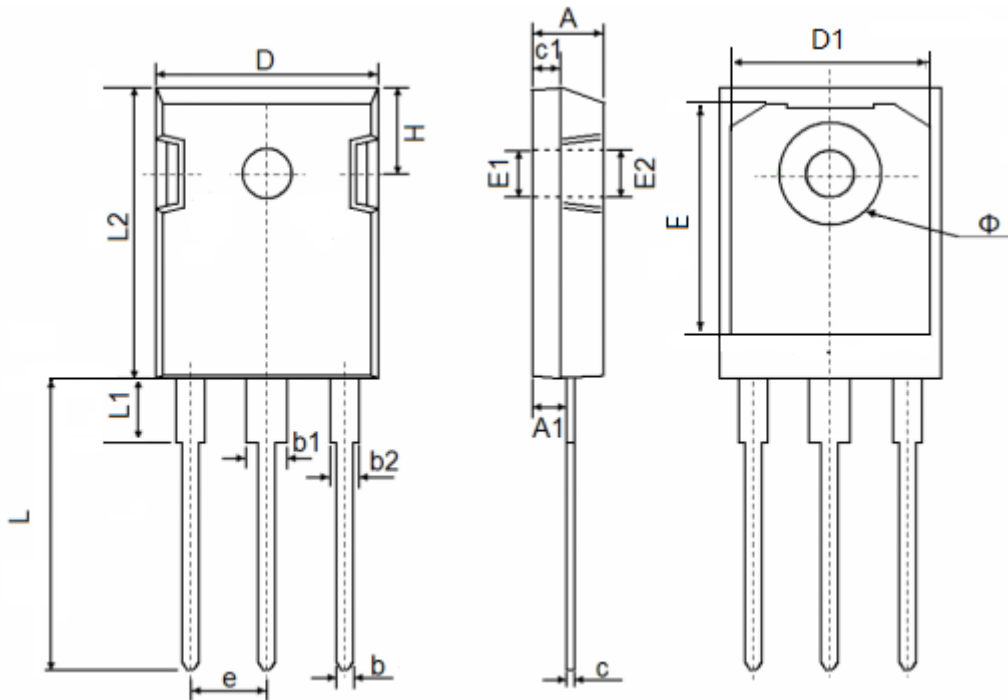


Figure 15. Output Capacitor Stored Energy

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	2.250	2.550	0.089	0.100
b	1.050	1.350	0.041	0.053
b1	2.850	3.400	0.112	0.134
b2	1.900	2.420	0.075	0.095
c	0.550	0.700	0.022	0.028
c1	1.900	2.200	0.075	0.087
D	15.700	16.200	0.618	0.638
D1	13.000	14.200	0.512	0.559
E	16.250	17.650	0.640	0.695
E1	3.650	5.200	0.144	0.205
E2	3.650	5.200	0.144	0.205
L	19.800	20.350	0.780	0.801
L1	4.000	4.500	0.157	0.177
L2	20.800	21.200	0.819	0.835
φ	7.180 BSC		0.283 BSC	
e	5.440 BSC		0.214 BSC	
H	6.000	6.300	0.236	0.248