

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D@25^{\circ}C$
3300V	70mΩ@18V	68A

Feature

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

Application

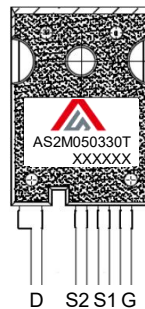
- Solar Inverters
- Rail Traction
- Motor Drives
- Ultra-Fast EV Chargers
- Pulsed Power applications

Package



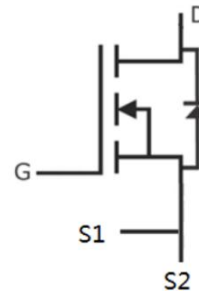
TO-247-4

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}	$V_{GS} = 0V, I_D = 100\mu A$	3300	V
Gate-Source Voltage	V_{GSmax}	Absolute maximum values	-10/+22	V
Gate-Source Voltage	V_{GSOP}	Recommended operational values	-5/+18	V
Continuous Drain Current	I_D	$V_{GS}=18V, T_C=25^{\circ}C$	68	A
	I_D	$V_{GS}=18V, T_C=100^{\circ}C$	42	A
Power Dissipation	P_D	$T_C=25^{\circ}C$	560	W
Thermal Resistance (Typ)	$R_{\theta JC}$	Junction-to-Case	0.22	$^{\circ}C/W$
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 _D = 100μA	3300			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 3300V, V _{GS} = 0V		1	100	μA
Gate-Source leakage current	I _{GSS+}	V _{GS} = 22V, V _{DS} = 0V		10	250	nA
Gate-Source leakage current	I _{GSS-}	V _{GS} = -8V, V _{DS} = 0V		10	250	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 18mA	2.0	2.6	4.0	V
		V _{DS} = V _{GS} , I _D = 18mA, T _J = 150°C		1.8		V
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 18V, I _D = 50A		50	70	mΩ
		V _{GS} = 18V, I _D = 50A, T _J = 150°C		120	160	mΩ
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} = 1700V, V _{GS} = 0V, f = 1MHz V _{AC} = 25mV		5050		pF
Output Capacitance	C _{oss}			360		
Reverse Transfer Capacitance	C _{rss}			18		
Total Gate Charge	Q _g	V _{DS} = 1700V, V _{GS} = -4V/18V, I _D = 40A		262		nC
Gate-Source Charge	Q _{gs}			72		
Gate-Drain Charge	Q _{gd}			54		
Turn-on delay time	t _{d(on)}	V _{DS} = 1700V, V _{GS} = -5V/20V, I _D = 35A, R _{g(ext)} = 2.5Ω, R _L = 40Ω		34		nS
Turn-on rise time	t _r			47.2		
Turn-off delay time	t _{d(off)}			88		
Turn-off fall time	t _f			39.2		
Turn-On Energy	E _{on}	V _{DS} = 1700V, V _{GS} = -5V/20V, I _D = 35A, R _{g(ext)} = 2.5Ω, L = 200μH		6.18		mJ
Turn-Off Energy	E _{off}			3.77		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				68	A
Diode Forward voltage	V _{SD}	V _{GS} = -4V, I _{SD} = 25A		4.2		V
		V _{GS} = -4V, I _{SD} = 25A, T _J = 150°C		3.8		V
Reverse Recovery Time	t _{rr}	I _{SD} = 20A, V _R = 1700V		61		nS
Reverse Recovery Charge	Q _{rr}			298		nC
Peak Reverse Recovery Current	I _{rrm}				8.9	

Typical Characteristics

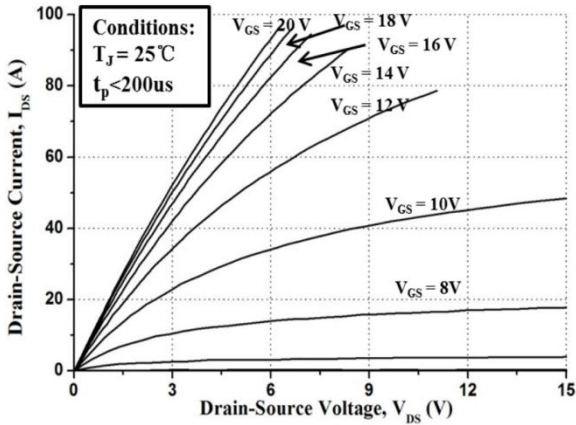


Figure 1. Output Characteristics $T_J = 25\text{ }^\circ\text{C}$

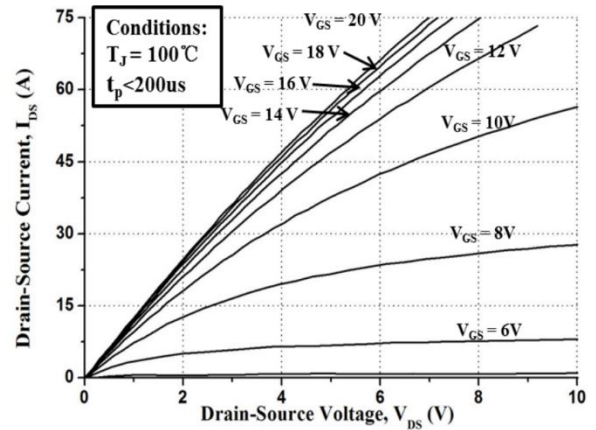


Figure 2. Output Characteristics $T_J = 100\text{ }^\circ\text{C}$

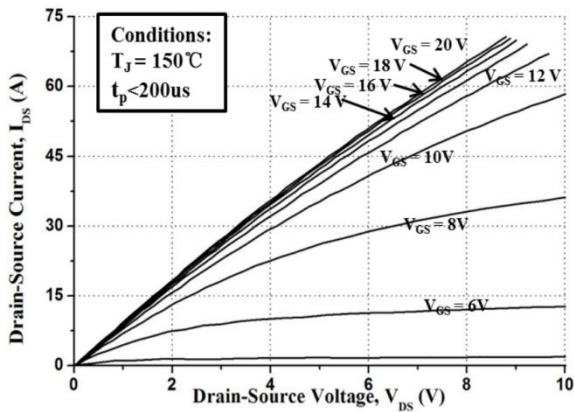


Figure 3. Output Characteristics $T_J = 150\text{ }^\circ\text{C}$

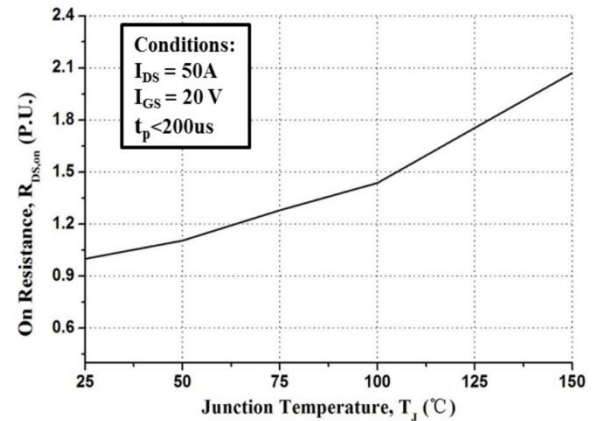


Figure 4. Normalized On-Resistance vs. Temperature

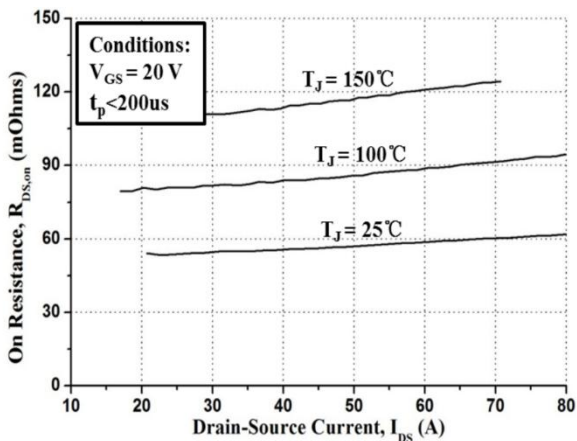


Figure 5. On-Resistance vs. Drain Current
For Various Temperatures

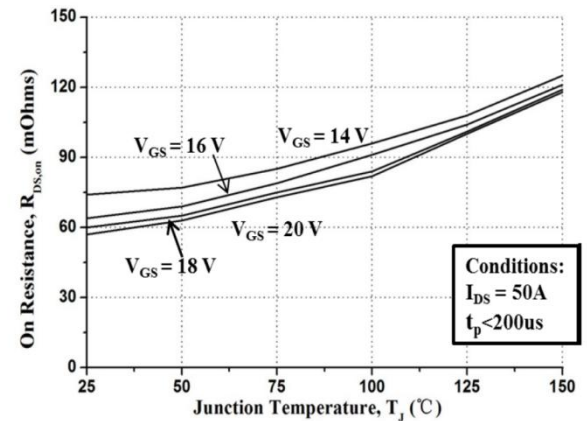


Figure 6. On-Resistance vs. Temperature
For Various Gate Voltage

Typical Characteristics

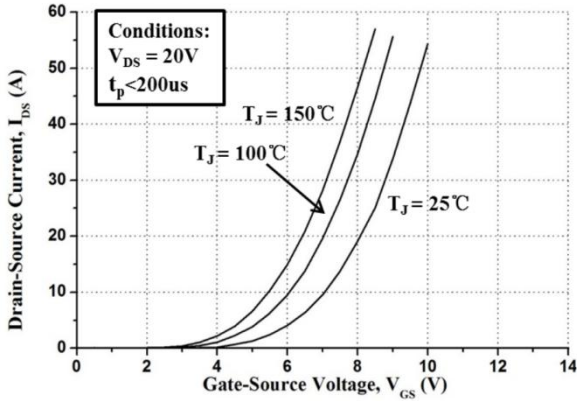


Figure 7. Transfer Characteristic for Various Junction Temperatures

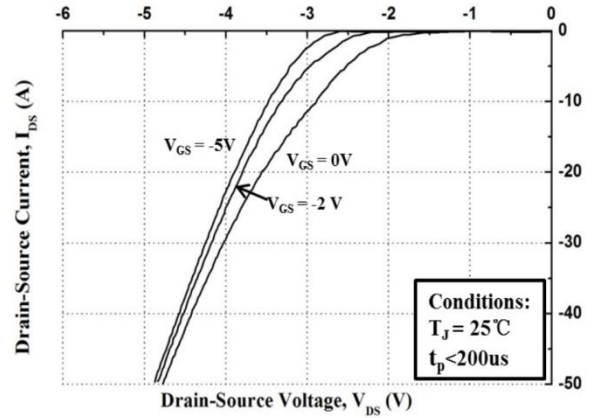


Figure 8. Body Diode Characteristic at 25 °C

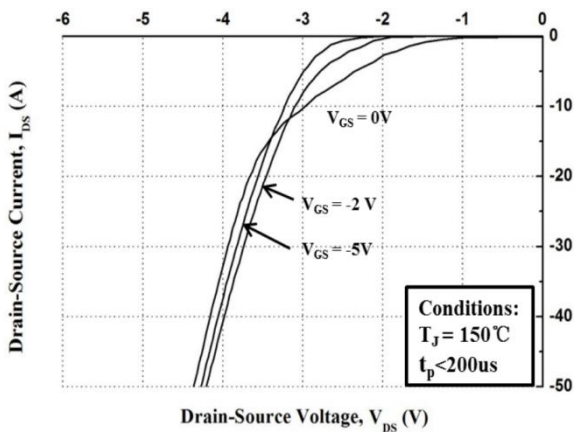


Figure 9. Body Diode Characteristic at 150 °C

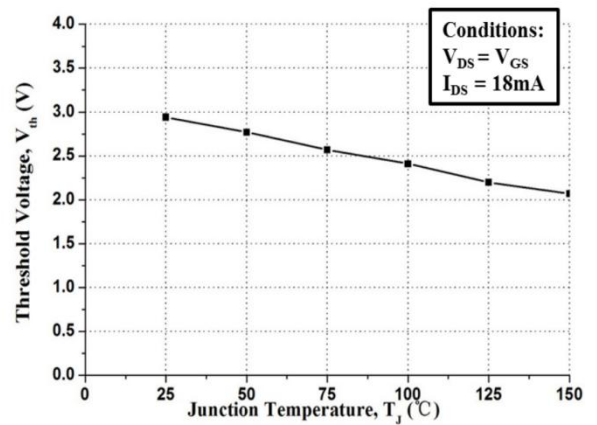


Figure 10. Threshold Voltage vs. Temperature

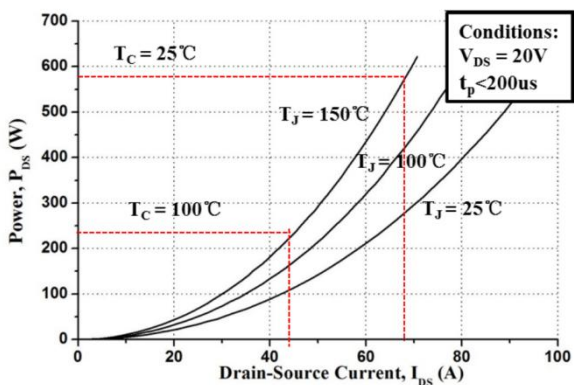


Figure 11. Power Dissipation vs. Drain Current Various Junction Temperatures

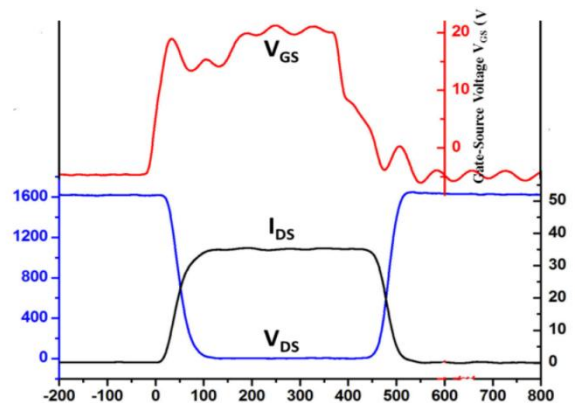
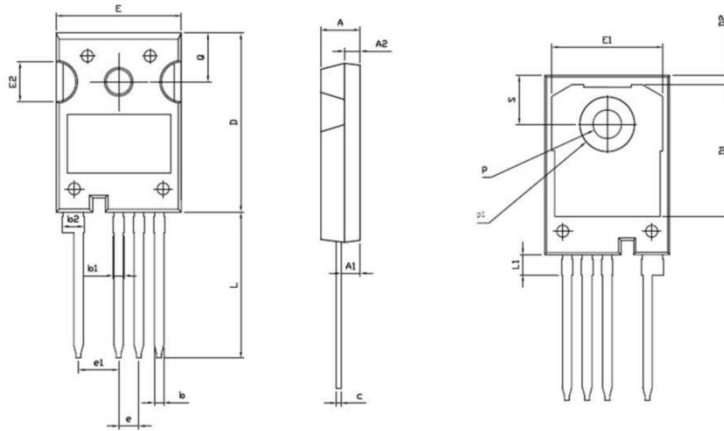


Figure 12. Switching waveforms

TO-247-4 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.800	5.200	0.189	0.205
A1	2.250	2.450	0.089	0.096
A2	1.850	2.150	0.073	0.085
b	1.050	1.350	0.041	0.053
b1	1.000	1.600	0.039	0.063
b2	2.350	2.950	0.093	0.116
c	0.500	0.700	0.020	0.028
D	22.340	22.740	0.880	0.895
D1	16.000	17.000	0.630	0.669
D2	0.970	1.370	0.038	0.054
e	2.340	2.740	0.092	0.108
e1	4.880	5.280	0.192	0.208
E	15.600	16.000	0.614	0.630
E1	13.500	14.500	0.531	0.571
E2	4.800	5.200	0.189	0.205
L	18.080	18.680	0.712	0.735
L1	2.380	2.780	0.094	0.109
P	3.500	3.700	0.138	0.146
p1	6.600	7.000	0.260	0.276
Q	6.000	6.300	0.236	0.248
S	6.000	6.300	0.236	0.248