



General Features

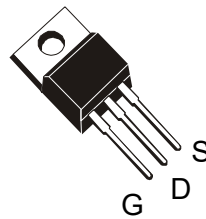
- High density cell design for ultra low $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

Application

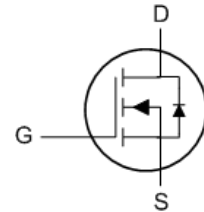
- Automotive applications
- Hard switched and high frequency circuits
- Uninterruptible power supply

Product Summary

V_{DS}	100	V
$R_{DS(on),Typ}@ V_{GS}=10V$	4.5	m Ω
I_D	135	A



TO-220



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

Symbol	Parameter	Condition	Value	Unit
V_{DS}	Drain-Source Voltage		100	V
I_D	Continuous Drain Current ¹	$T_C=25^\circ\text{C}$	135	A
		$T_C=70^\circ\text{C}$	48	A
V_{GS}	Gate-Source Voltage		± 20	V
I_{DM}	Pulsed Drain Current ²	$T_C=25^\circ\text{C}$	700	A
P_D	Total Power Dissipation	$T_C=25^\circ\text{C}$	100	W
T_{STG}	Storage Temperature Range		-55 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature		-55 to 175	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	--	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	--	0.5	

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Limit	Min	Typ	Max	Unit
Static Characteristic						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	--	--	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3.0	4	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V$	--	--	1	uA
		$V_{DS}=48V, V_{GS}=0V$	--	--	100	
I_{GSS}	Gate -Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 100	nA -
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=20A$	-	4.5	5.0	m Ω
Dynamic Characteristic						
C_{iss}	Input Capacitance	$V_{DS}=40V, V_{GS}=0V, f=1MHz$	--	2890	--	pF
C_{oss}	Output Capacitance		--	881	--	
C_{rss}	Reverse Transfer Capacitance		--	13.2	--	
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=40V, V_{GS}=10V, R_G=2\Omega, I_D=20A$	--	16	--	nS
t_r	Turn-On Rise Time		--	13	--	
$t_{d(off)}$	Turn-off Delay Time		--	28	--	
t_f	Turn-Off Fall Time		--	7.5	--	
Gate Charge Characteristic						
Q_g	Total Gate Charge	$V_{DD}=30V, V_{GS}=10V, I_D=30A$	--	23	--	nC
Q_{gs}	Gate-Source Charge		--	5.2	--	
Q_{gd}	Gate-Drain Charge		--	7.3	--	
Reverse diode Characteristic						
V_{SD}	forward on voltage	$I_{SD}=20A, V_{GS}=0V$	--	--	1.2	V
t_{rr}	Reverse Recovery Time	$V_R=0V, I_F=20A, DI_F/dt=100A/uS$	--	46	--	nS
Q_{rr}	Reverse Recovery Charge		--	182	--	nC

Typical Electrical and Thermal Characteristics (Curves)

Figure 2. Safe operating area

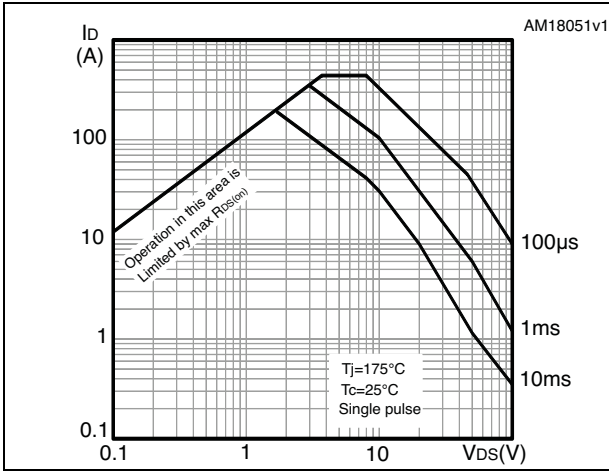


Figure 3. Thermal impedance

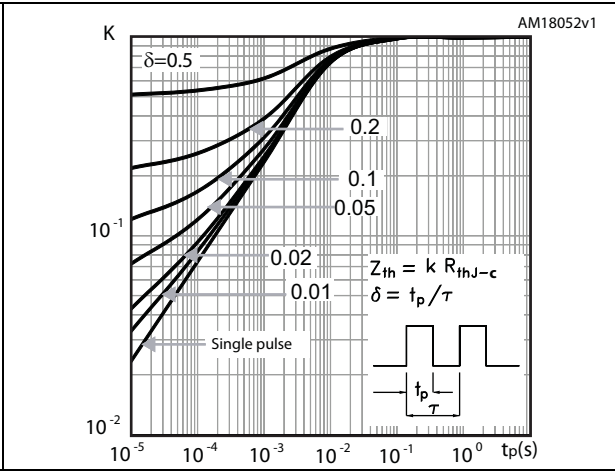


Figure 4. Output characteristics

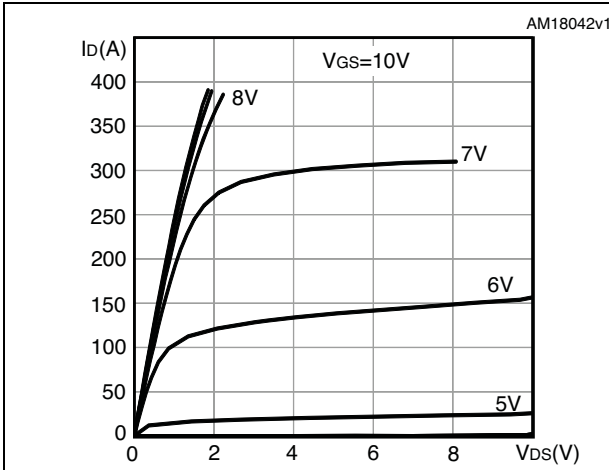


Figure 5. Transfer characteristics

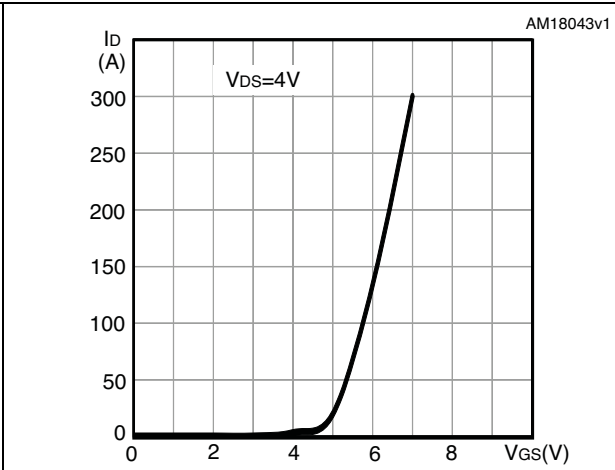


Figure 6. Gate charge vs gate-source voltage

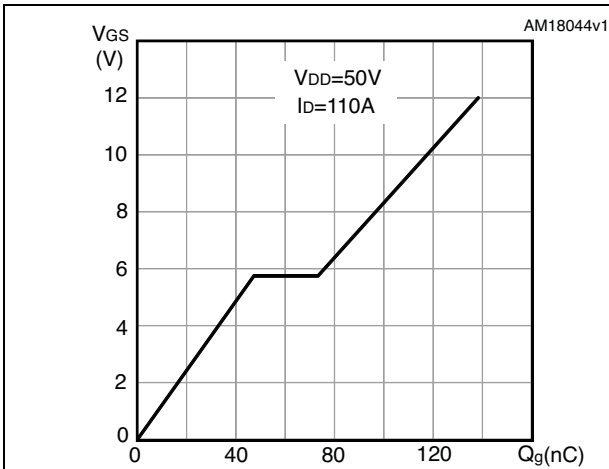


Figure 7. Static drain-source on-resistance

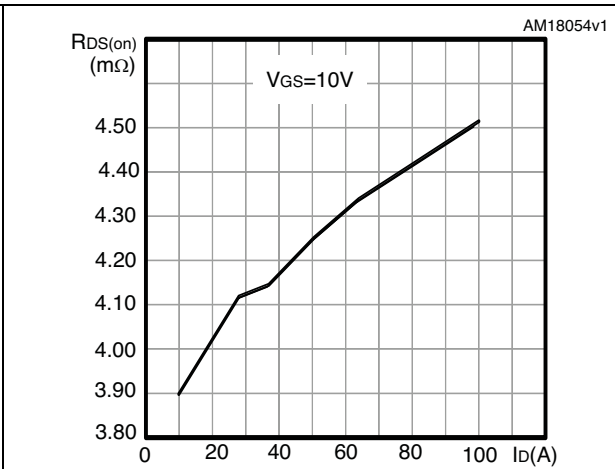


Figure 8. Capacitance variations

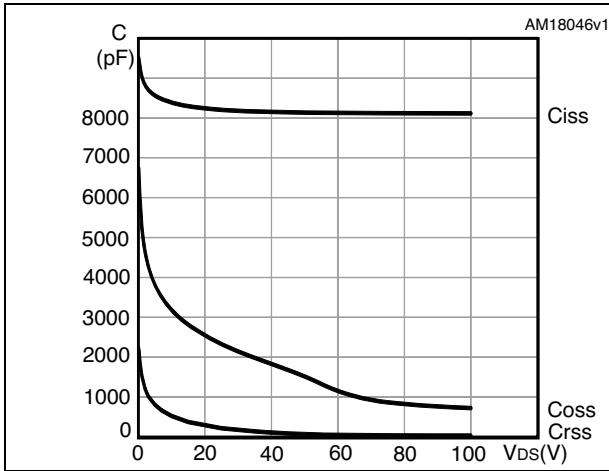


Figure 9. Normalized gate threshold voltage vs temperature

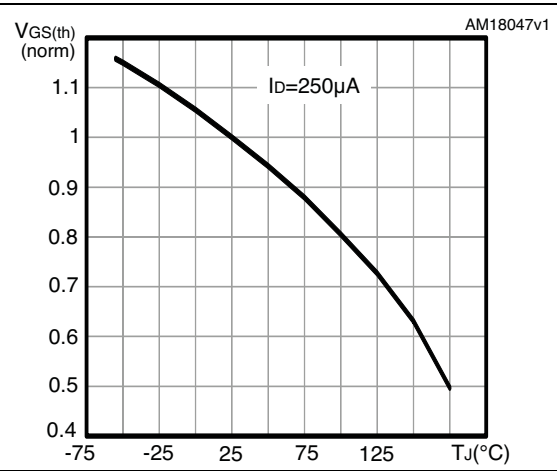


Figure 10. Normalized on-resistance vs temperature

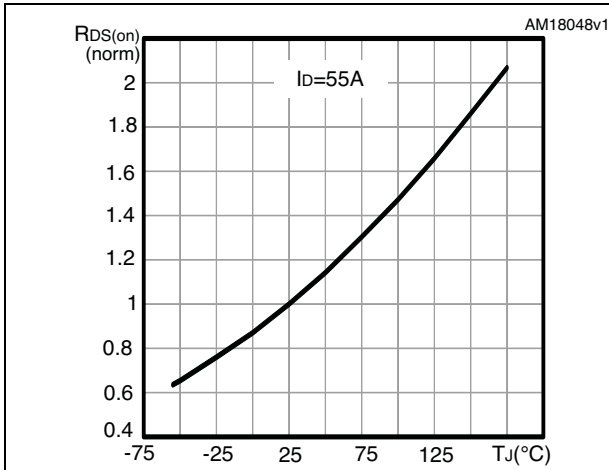


Figure 11. Normalized V_{DS} vs temperature

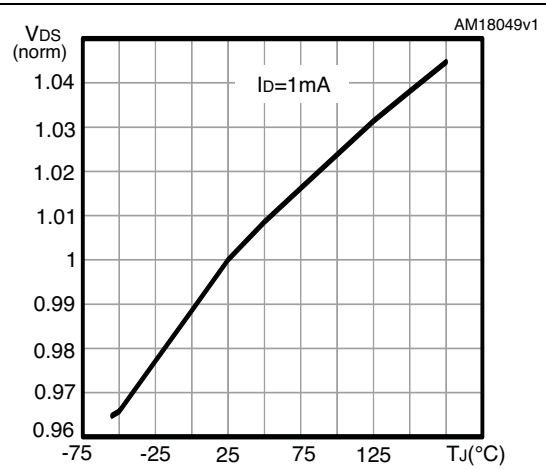
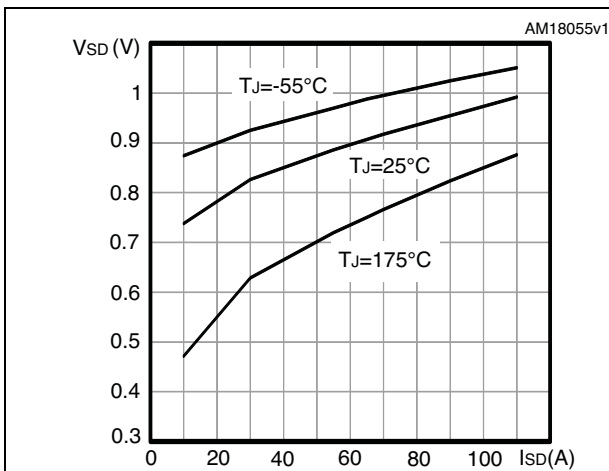


Figure 12. Source-drain diode forward characteristics



Test circuits

Figure 13. Switching times test circuit for resistive load

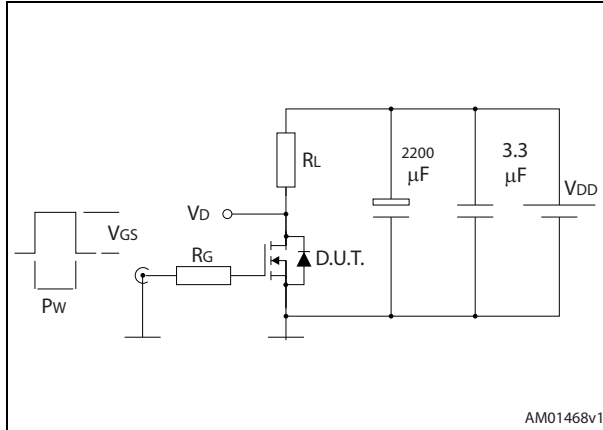


Figure 14. Gate charge test circuit

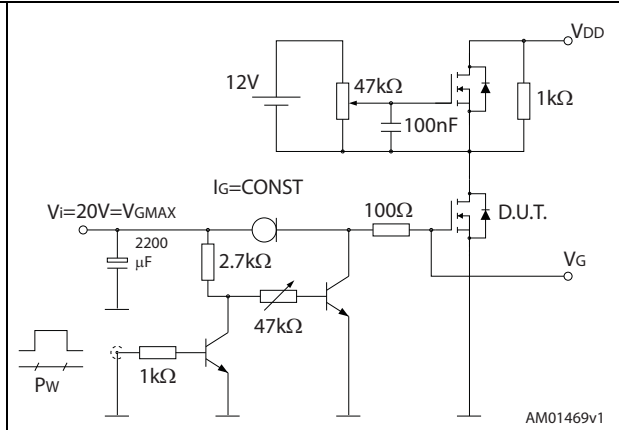


Figure 15. Test circuit for inductive load switching and diode recovery times

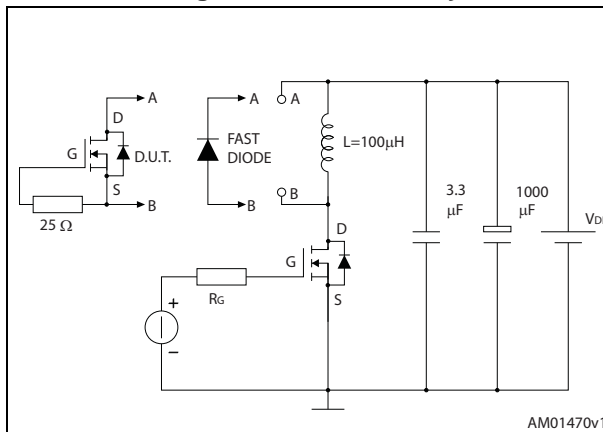


Figure 16. Unclamped inductive load test circuit

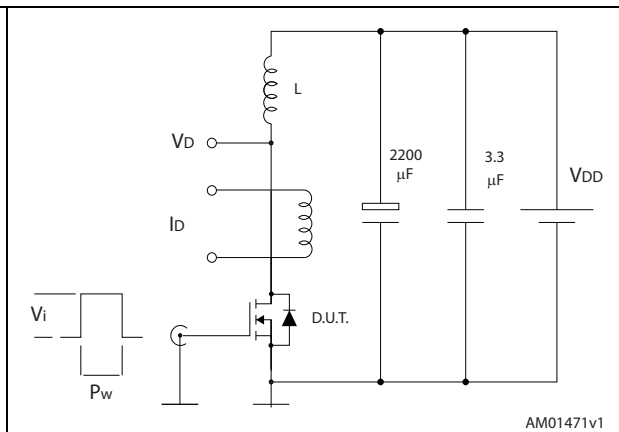


Figure 17. Unclamped inductive waveform

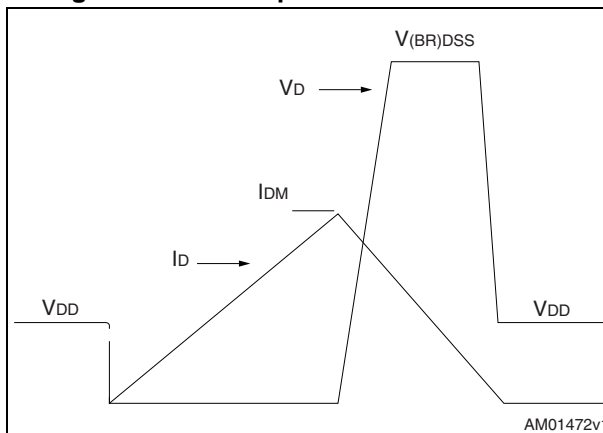
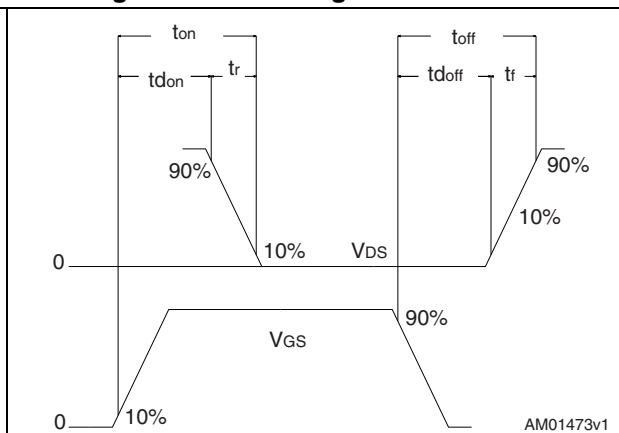
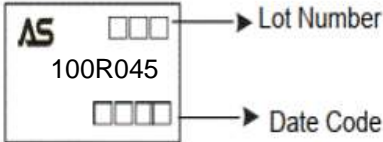


Figure 18. Switching time waveform

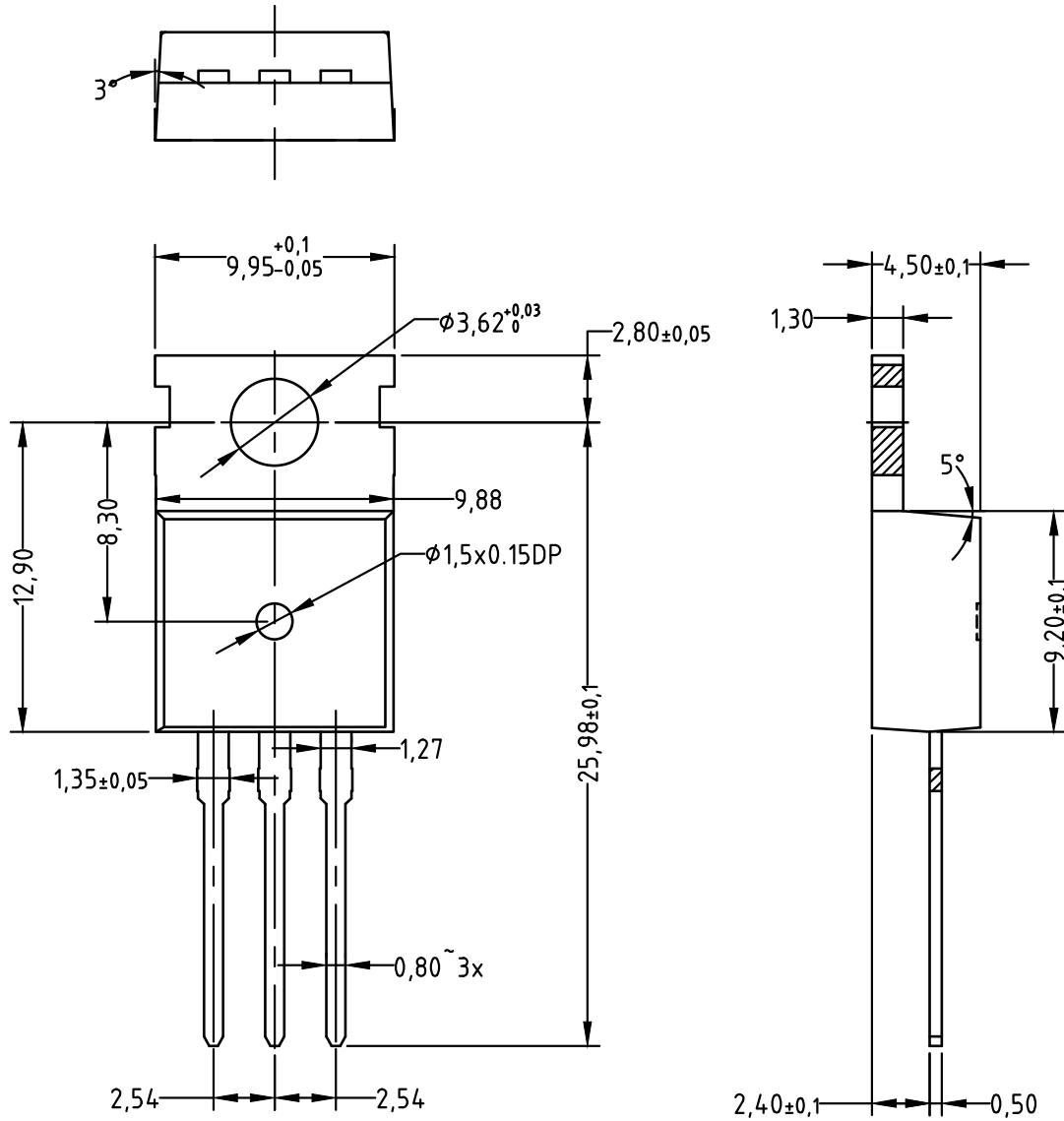


Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM100R045NP-T	100R045N	TO-220	Tube	50/Tube

PACKAGE	MARKING
TO-220	 <p>AS □□□ → Lot Number 100R045 □□□□ → Date Code</p>

TO-220



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