

General Features

- High density cell design for ultra low R_{dson}
- 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

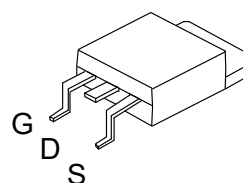
Product Summary



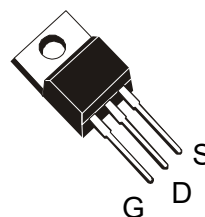
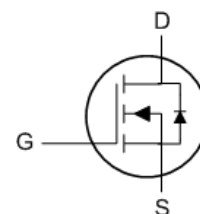
V_{DS}	100	V
$R_{DS(ON)-Typ}$	3.7	m Ω
I_D	135	A

Application

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



TO-263



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	--	63	°C/W
$R_{\theta Jc}$	Thermal Resistance-Junction to Case	--	1.3	

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	$V_{GS}=10V, I_D=20A$	-	3.7	4.5	mΩ
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

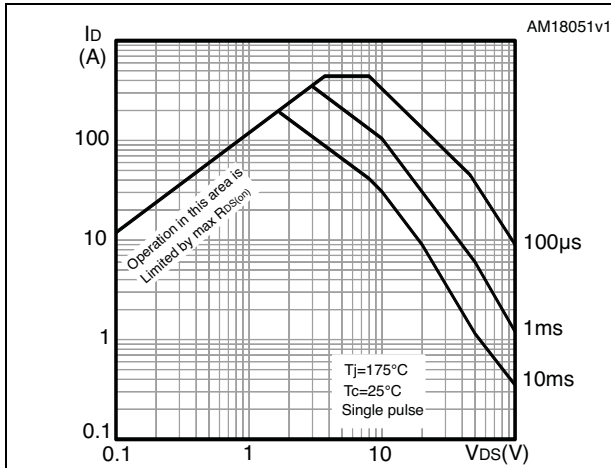


Figure 3. Thermal impedance

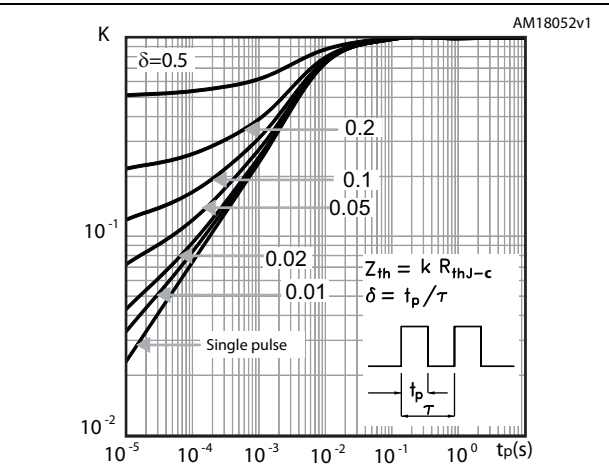


Figure 4. Output characteristics

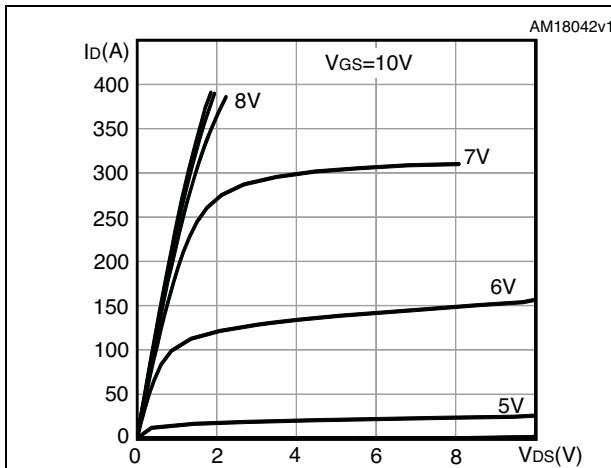


Figure 5. Transfer characteristics

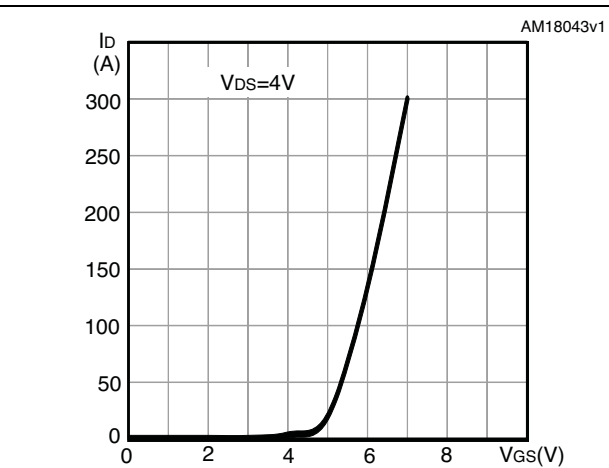


Figure 6. Gate charge vs gate-source voltage

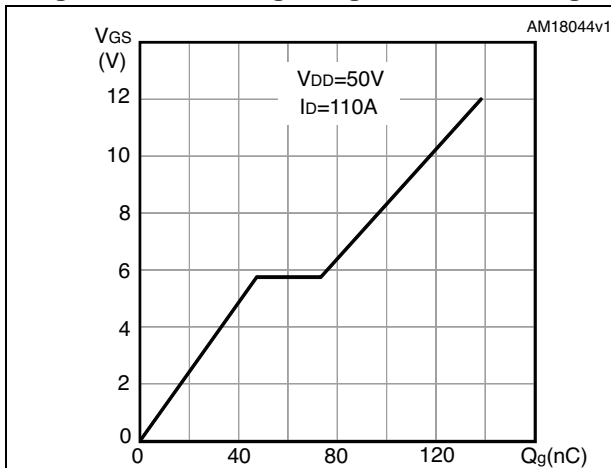


Figure 7. Static drain-source on-resistance

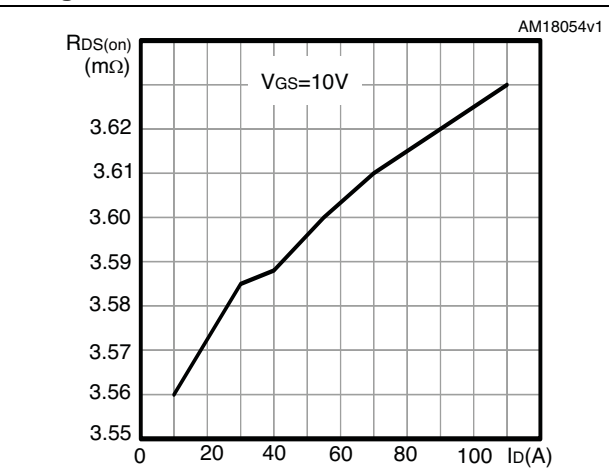


Figure 8. Capacitance variations

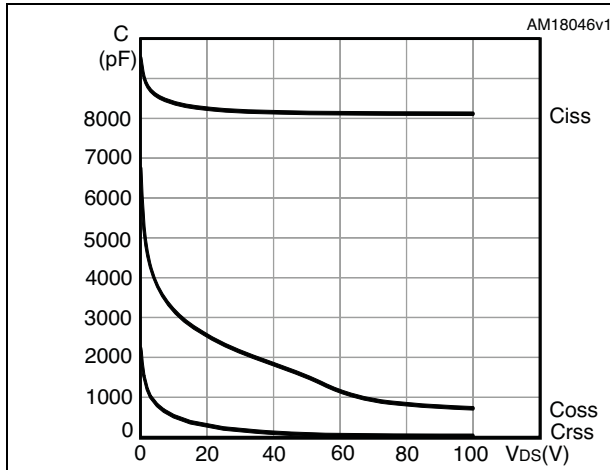


Figure 9. Normalized gate threshold voltage vs temperature

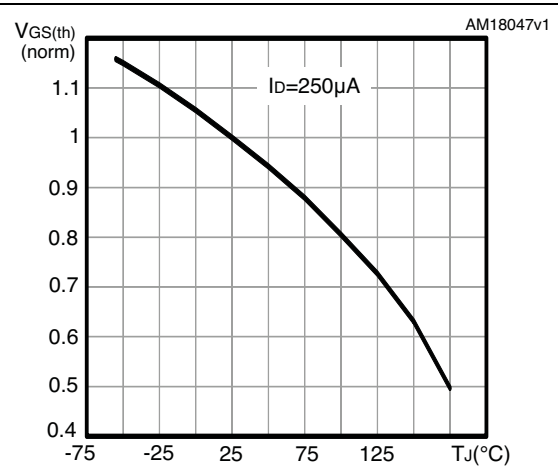


Figure 10. Normalized on-resistance vs temperature

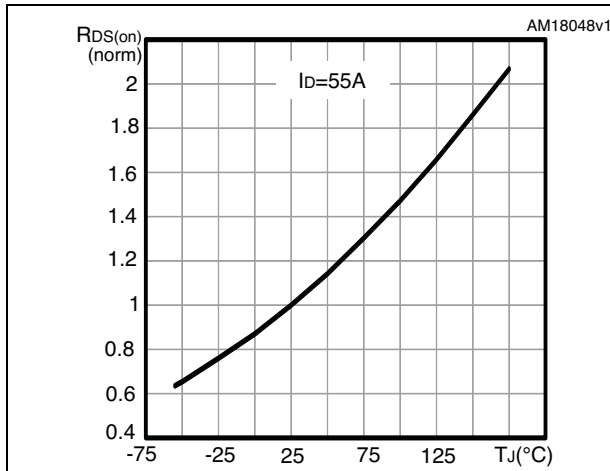


Figure 11. Normalized V_{DS} vs temperature

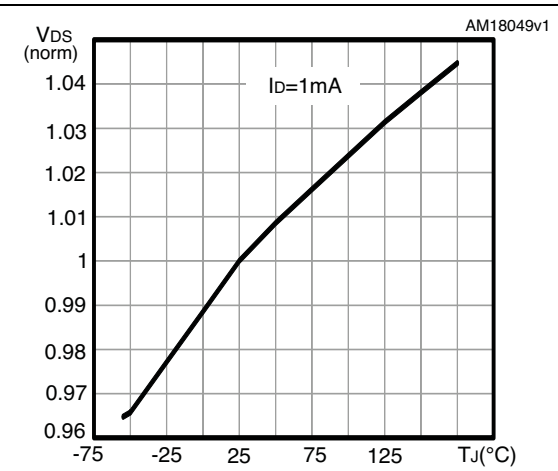
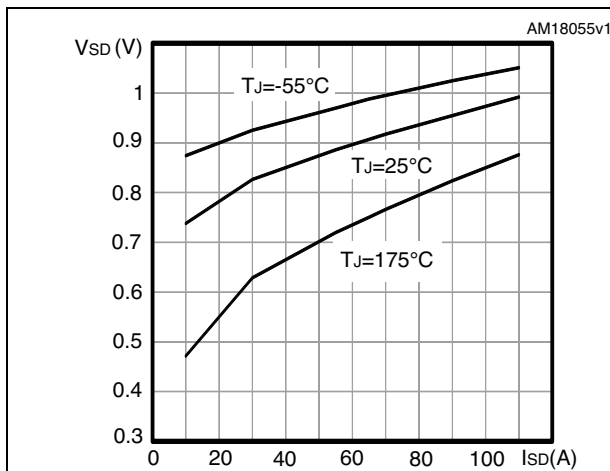


Figure 12. Source-drain diode forward characteristics



Test circuits

Figure 13. Switching times test circuit for resistive load

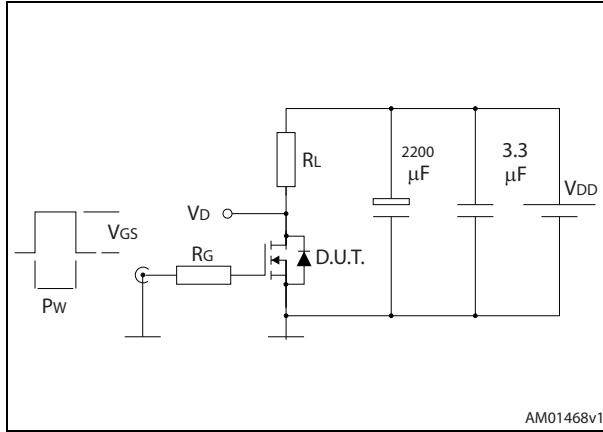


Figure 14. Gate charge test circuit

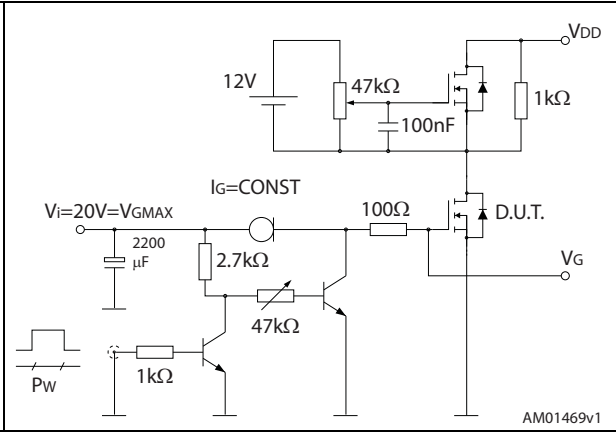


Figure 15. Test circuit for inductive load switching and diode recovery times

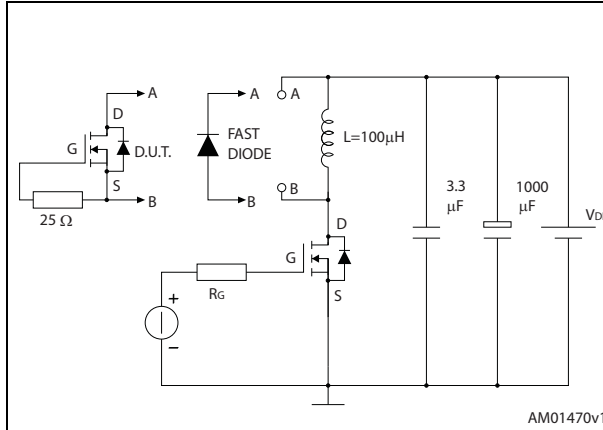


Figure 16. Unclamped inductive load test circuit

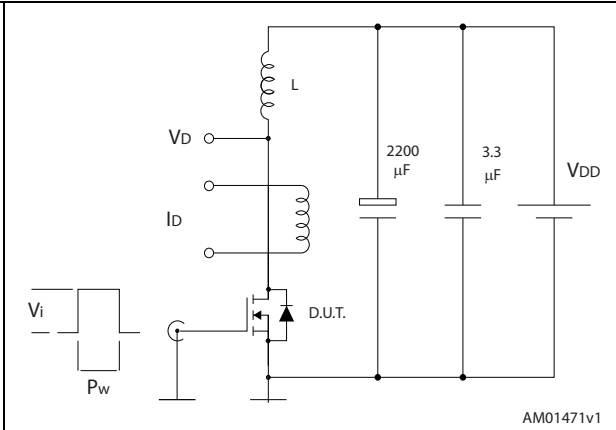


Figure 17. Unclamped inductive waveform

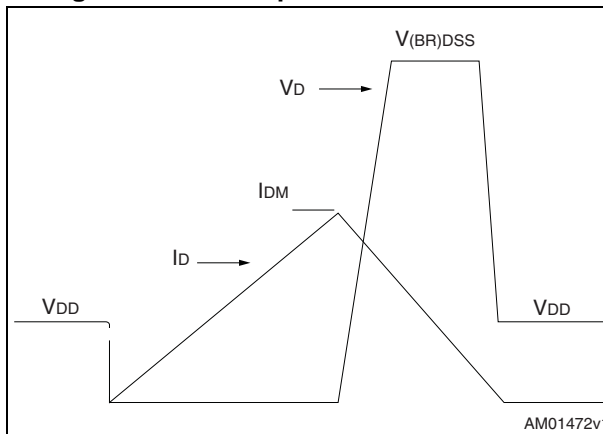
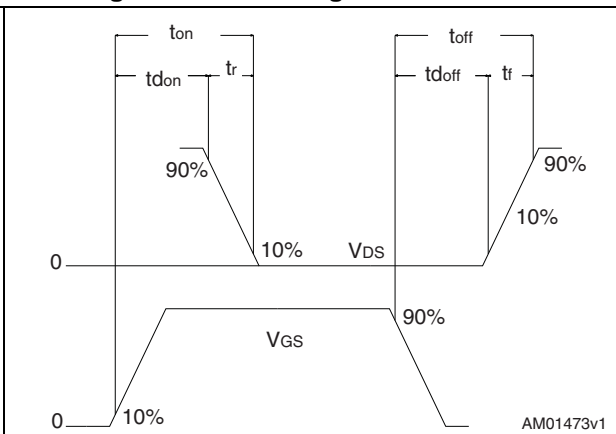
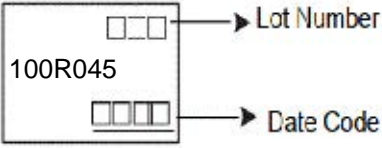


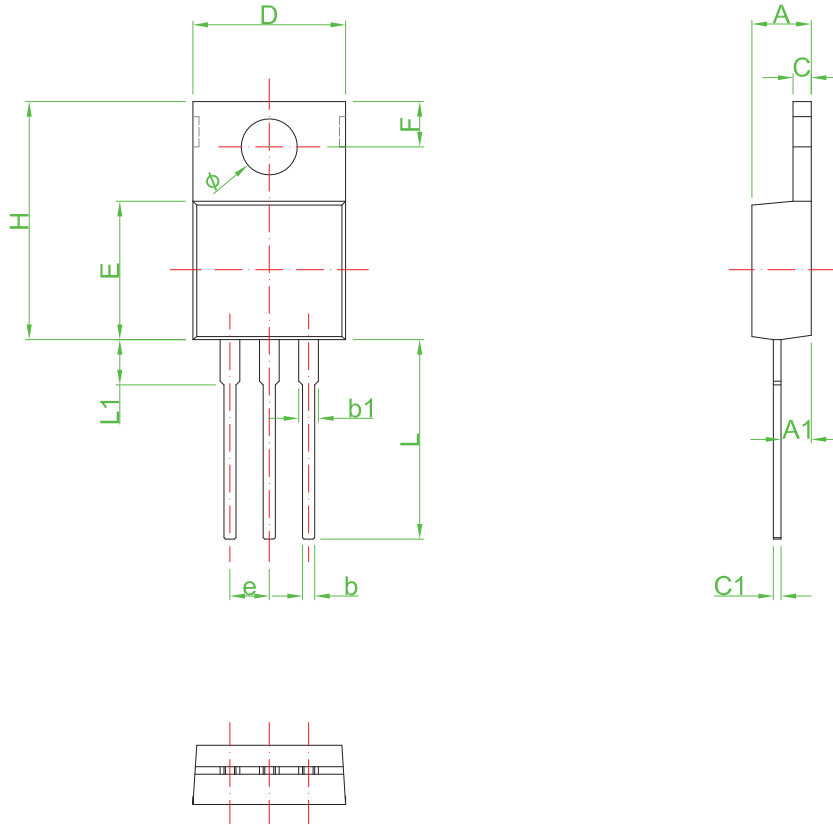
Figure 18. Switching time waveform



Ordering and Marking Information

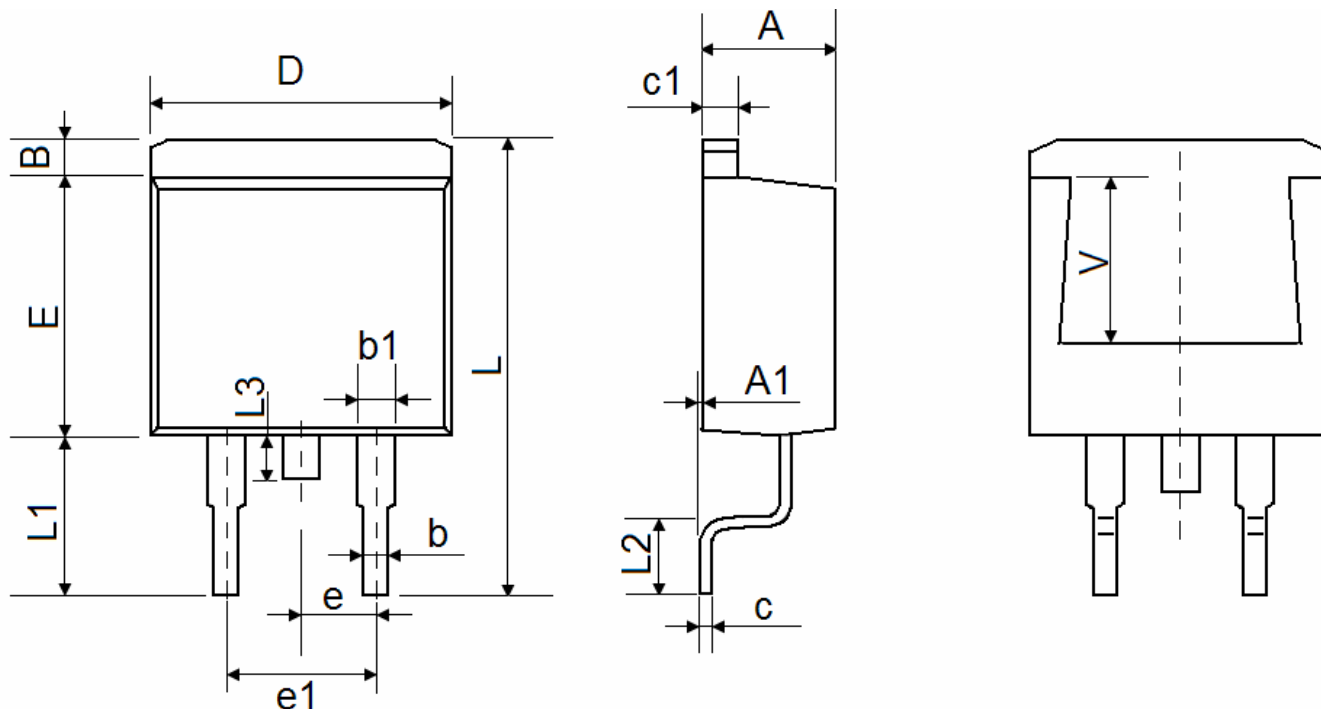
Ordering Device No	Marking	Package	Packing	Quantity
JMA100R045N-P-T	100R045N	TO-220	Tube	50
JMB100R045N-G-R	100R045N	TO-263	Tape&Reel	800

PACKAGE	MARKING
TO-220 TO-263	



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.00	4.80	0.157	0.189
A1	1.80	2.80	0.071	0.110
b	0.60	1.00	0.024	0.039
b1	1.14	1.78	0.045	0.070
C	1.00	1.40	0.039	0.055
C1	0.36	0.61	0.014	0.024
D	9.90	10.50	0.390	0.413
E	8.38	9.20	0.330	0.362
e	2.54 TYP		0.100 TYP	
F	2.54	3.20	0.100	0.126
ϕ	3.50	3.90	0.138	0.154
H	14.48	15.87	0.570	0.625
L	13.00	13.80	0.512	0.543
L1	---	4.10	---	0.161

TO-263- Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670		
A1	0.000	0.150		
B	1.170	1.370		
b	0.710	0.910		
b1	1.170	1.370		
c	0.310	0.530		
c1	1.170	1.370		
D	10.0 0	10.310	0.394	0.406
E	8.500	8.900		
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180		
L	15.0 0	15.450	0.593	0.608
L1	5.080	5.480		
L2	2.340	2.740		
L3	1.300	1.700		
V	5.600 REF		0.220 REF	

Disclaimer

The content specified herein is for the purpose of introducing JMW's products (hereinafter "Products"). The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

JMW does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of the Products or technical information described in this document.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). JMW shall bear no responsibility in any way for use of any of the Products for the above special purposes.

Although JMW endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a JMW product.

The content specified herein is subject to change for improvement without notice. When using a JMW product, be sure to obtain the latest specifications.