

**General Features**

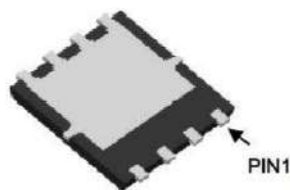
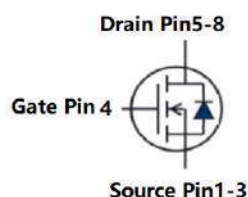
- $V_{DS} = 120V, I_D = 90A$ .
- Excellent gate charge x  $R_{DS(on)}$  product(FOM).
- Very low on-resistance  $R_{DS(on)}$ .
- 150°C operating temperature.
- Pb-free lead plating.
- 100% UIS Tested.
- 100%  $\Delta V_{ds}$  Tested.

**Product Summary**


$V_{DSS}$	120	V
$R_{DS(ON)-Typ}$	5.3	m $\Omega$
$I_D$	90	A

**Application**

- DC/DC Converter.
- Hard switched and high frequency circuits.
- Ideal for high-frequency switching and synchronous rectification.


**DFN5x6-8L**

**Absolute Maximum Ratings ( $T_C=25^\circ C$  unless otherwise noted)**

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	120	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	90	A
Drain Current-Continuous( $T_C=100^\circ C$ )	$I_D(100^\circ C)$	64	A
Pulsed Drain Current	$I_{DM}$	360	A
Maximum Power Dissipation	$P_D$	130	W
Derating factor		1.04	W/ $^\circ C$
Single pulse avalanche energy <sup>(Note 4)</sup>	$E_{AS}$	400	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ C$

**Thermal Characteristic**

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.96	$^\circ C/W$
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**Electrical Characteristics (T<sub>c</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	120		-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =120V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.2	1.8	2.5	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =45A	-	5.3	6.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =45A		6.5	8.0	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =50A		60	-	S
<b>Dynamic Characteristics</b> (Note 3)						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, F=1.0MHz	-	4900	-	pF
Output Capacitance	C <sub>OSS</sub>		-	300	-	pF
Reverse Transfer Capacitance	C <sub>RSS</sub>		-	34	-	pF
<b>Switching Characteristics</b> (Note 3)						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =60V, I <sub>D</sub> =45A V <sub>GS</sub> =10V, R <sub>G</sub> =1.6Ω	-	20	-	nS
Turn-on Rise Time	t <sub>r</sub>		-	15	-	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		-	40	-	nS
Turn-Off Fall Time	t <sub>f</sub>		-	10	-	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =60V, I <sub>D</sub> =45A, V <sub>GS</sub> =10V	-	90	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	21	-	nC
Gate-Drain Charge	Q <sub>gd</sub>		-	23.5	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 2)	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =45A	-	-	1.2	V
Diode Forward Current	I <sub>S</sub>		-	-	90	A
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> = 45A di/dt = 100A/μs (Note 3)	-	70	-	nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	137	-	nC

**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
3. Guaranteed by design, not subject to production
4. EAS condition : T<sub>J</sub>=25°C, V<sub>DD</sub>=50V, V<sub>G</sub>=10V, L=0.25mH, R<sub>G</sub>=25Ω

Typical Electrical and Thermal Characteristics

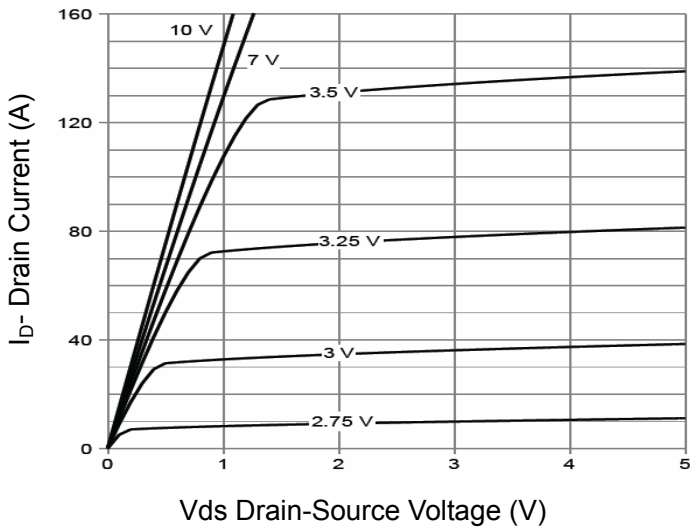


Figure 1 Output Characteristics

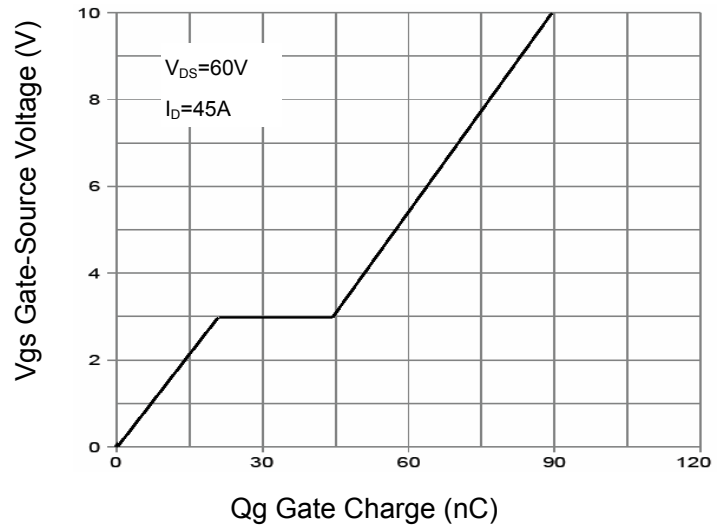


Figure 4 Gate Charge

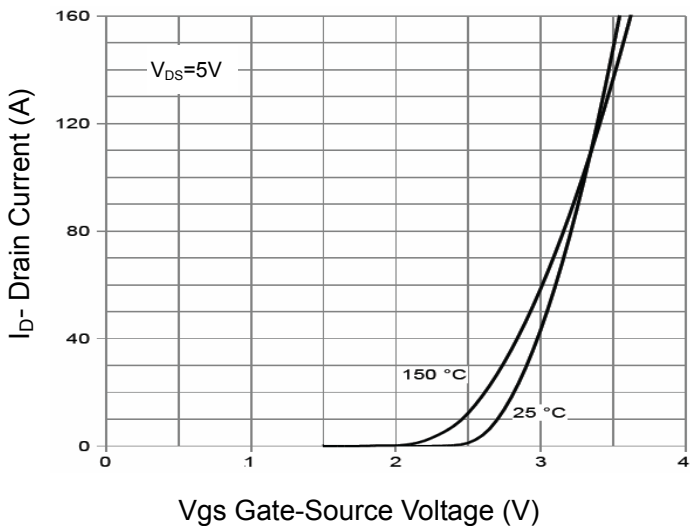


Figure 2 Transfer Characteristics

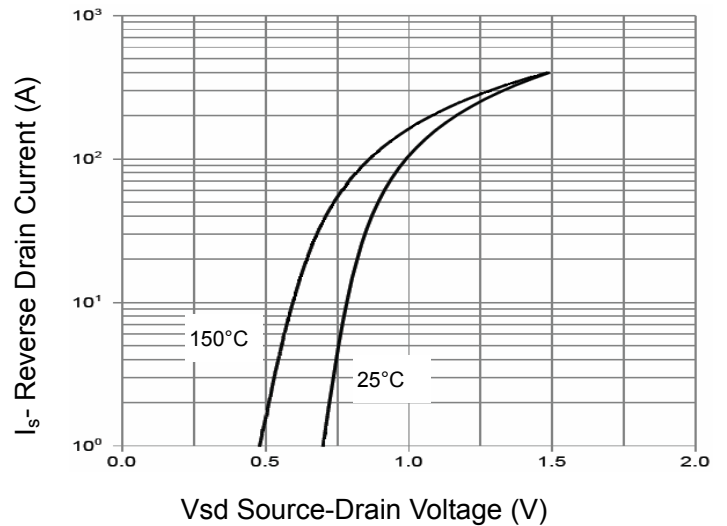


Figure 5 Source-Drain Diode Forward

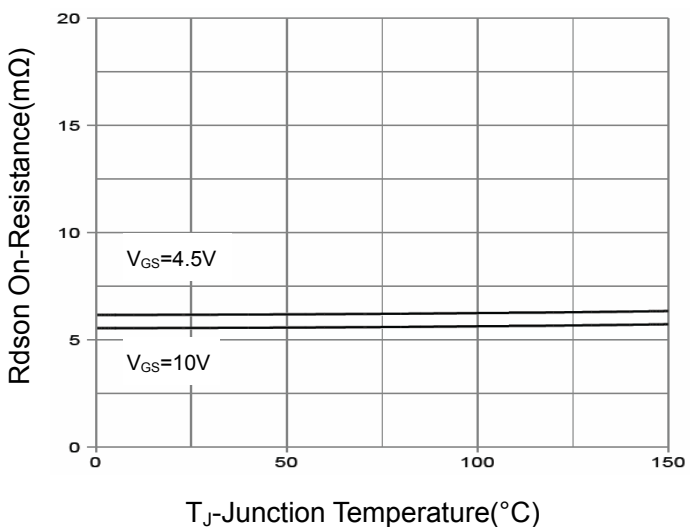


Figure 3 Rdson-Junction Temperature

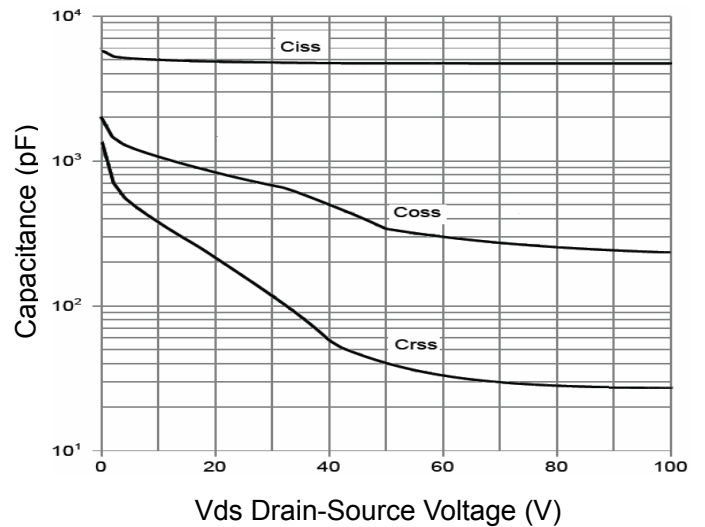
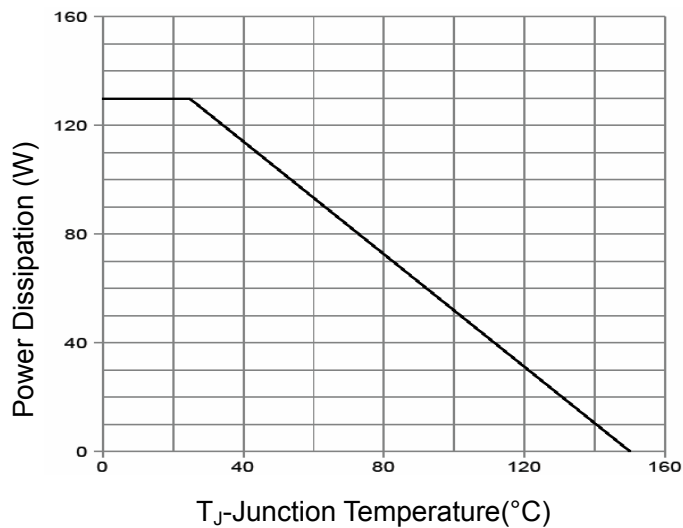
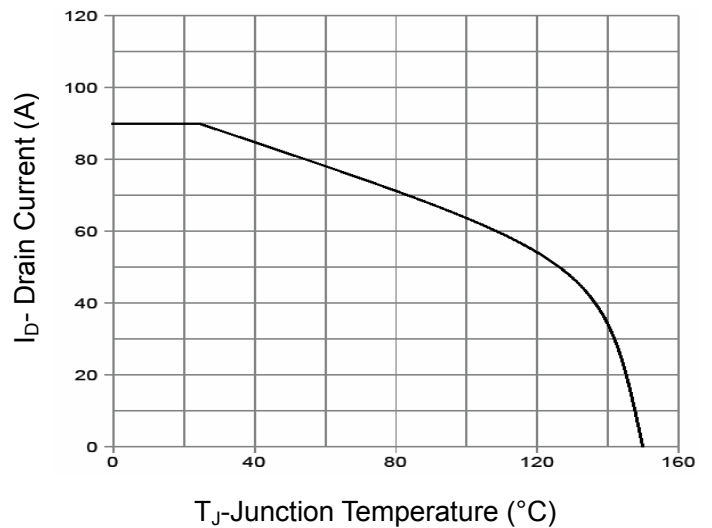


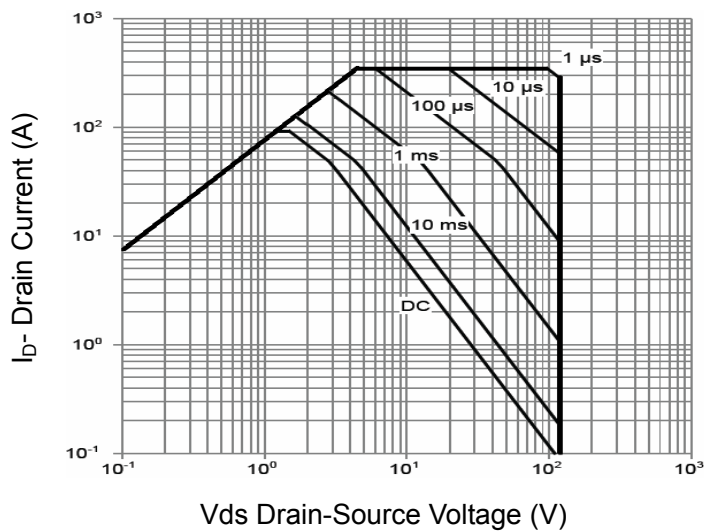
Figure 6 Capacitance vs Vds



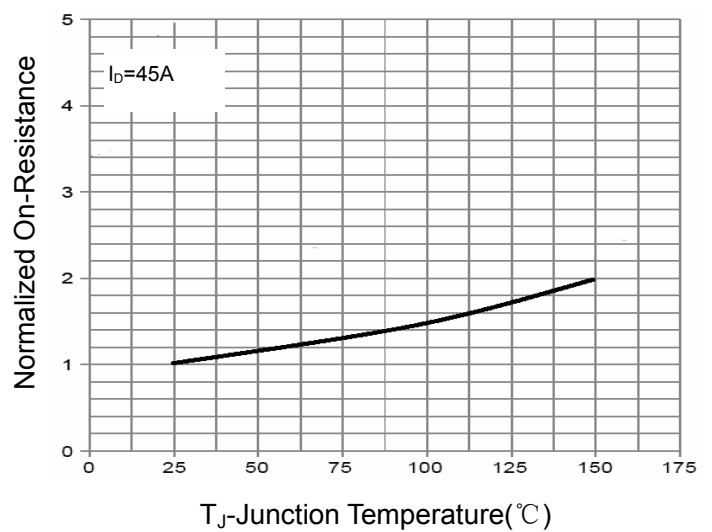
T<sub>J</sub>-Junction Temperature(°C)  
**Figure 7 Power De-rating**



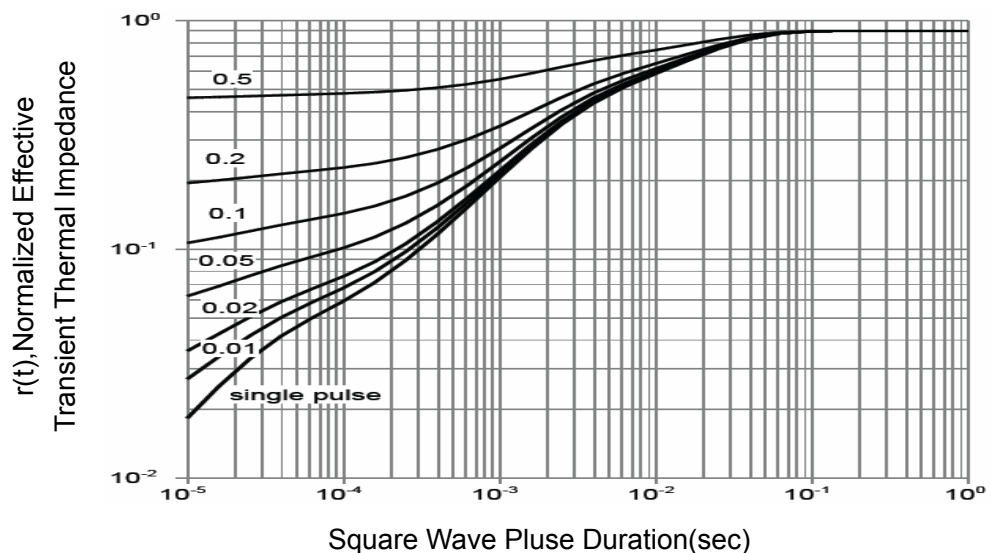
T<sub>J</sub>-Junction Temperature (°C)  
**Figure 9 Current De-rating**



V<sub>ds</sub> Drain-Source Voltage (V)  
**Figure 8 Safe Operation Area**



T<sub>J</sub>-Junction Temperature(°C)  
**Figure 10 Rdson-Junction Temperature**



**Figure 11 Normalized Maximum Transient Thermal Impedance**

## Test circuits

Figure 12. Switching times test circuit for resistive load

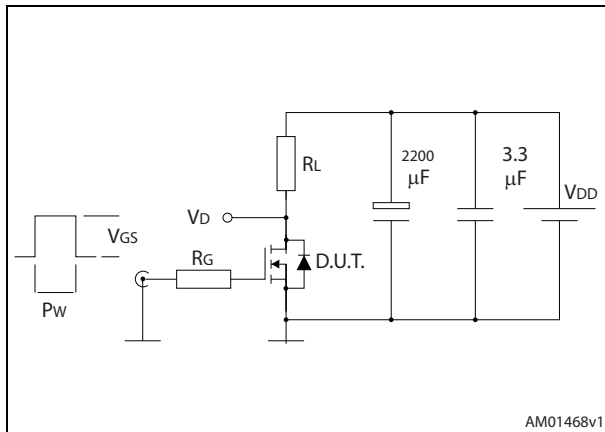


Figure 13. Gate charge test circuit

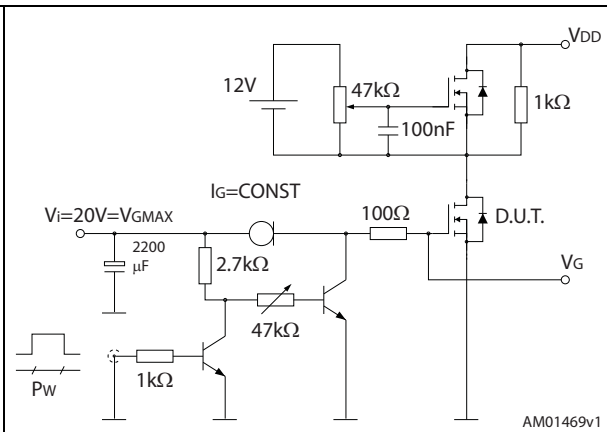


Figure 14. Test circuit for inductive load switching and diode recovery times

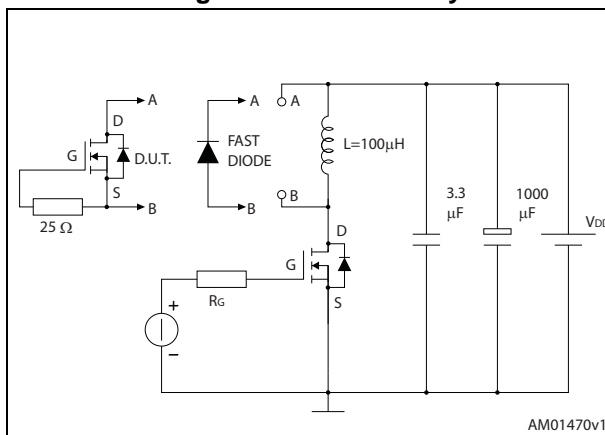


Figure 15. Unclamped inductive load test circuit

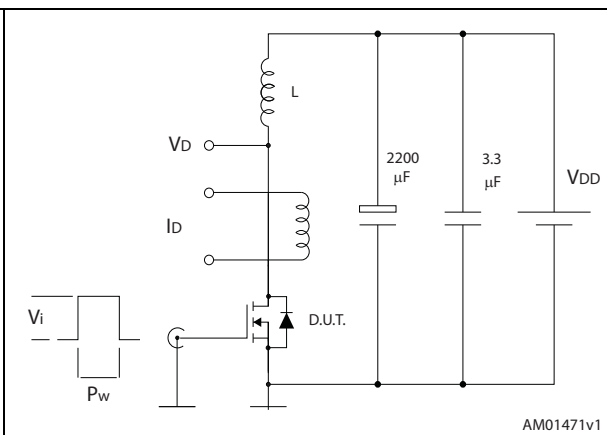


Figure 16. Unclamped inductive waveform

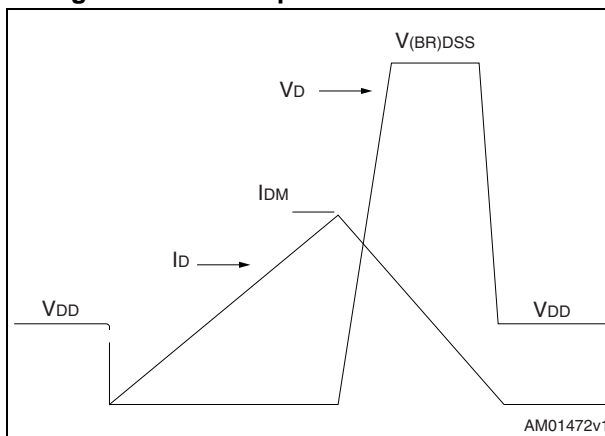
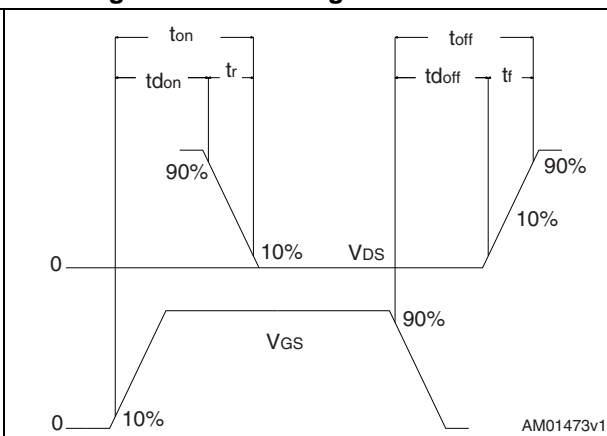
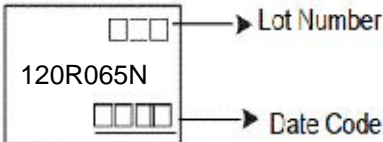


Figure 17. Switching time waveform

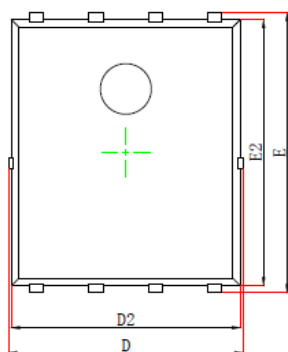


### Ordering and Marking Information

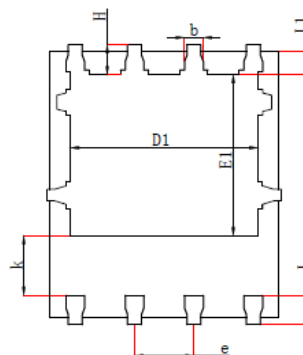
Ordering Device No.	Marking	Package	Packing	Quantity
JMN120R065N-R	120R065N	DFN5*6-8	Tape&Reel	5000

PACKAGE	MARKING
DFN5*6-8	 <p>The diagram shows a rectangular marking area containing the text '120R065N'. Above this text are two small squares, with an arrow pointing to the label 'Lot Number'. Below the text are four small squares, with an arrow pointing to the label 'Date Code'.</p>

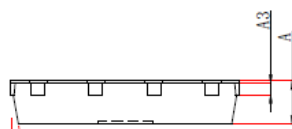
## DFN5X6-8L Package Information



Top View  
[顶视图]



Bottom View  
[背视图]



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

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