DFN2020-6L Plastic-Encapsulate MOSFETS

Features

- V_{DS}=-12V
- I_D=-15A
- $R_{DS(on)}$@V_{GS}=-4.5V < 18mΩ
- $R_{DS(on)}$@V_{GS}=-2.5V < 22mΩ
- $R_{DS(on)}$@V_{GS}=-1.8V < 45mΩ
- $R_{DS(on)}$@V_{GS}=-1.5V < 80mΩ
- Low Thermal Resistance
- Low Gate Charge

Drain-source Voltage
-12V
Drain Current
-15 Ampere

Applications

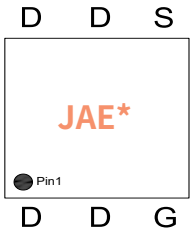
- Load Switch for Protable Devices
- Voltage controlled small signal switch

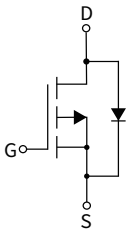
Mechanical Data

- Case: DFN2020-6L
  Molding compound meets UL 94V-0 flammability rating, RoHS-compliant,halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750,Method 2026

DFN2020-6L

Function Diagram





Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
DFN2020-6L	R3	0.01	3000	30000	90000	7''

Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Drain-source Voltage	V_{DS}	V	-12
Gate-source Voltage	V_{GS}	V	±12
Drain Current[1]	I_D	A	-15
Pulsed Drain Current[1]	I_{DM}	A	-65
Total Power Dissipation	P_D	W	18
Junction temperature	T_J	°C	-55 ~+150
Storage temperature	T_{stg}	°C	-55 ~+150
Thermal Resistance Junction-to-Case[2]	$R_{\theta JC}$	°C / W	6.9
Thermal Resistance Junction-to-Ambient[2]	$R_{\theta JA}$	°C / W	50

Static Parameter Characteristics (Tj=25°C Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=-250μA	V	-12	—	—
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-12V, V_{GS}=0V	μA	—	—	-1.0
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±8V, V_{DS}=0V	nA	—	—	±100
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=-250μA	V	-0.4	-0.7	-1.0
Static Drain-Source On-Resistance(3)	$R_{DS(ON)}$	V_{GS}= -4.5V, I_D=-7A	mΩ	—	14	18
		V_{GS}= -2.5V, I_D=-6A		—	18	22
		V_{GS}= -1.8V, I_D=-2.5A		—	25	45
		V_{GS}= -1.5V, I_D=-1A		—	50	80

Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, f=1MHz	pF	—	1725	—
Output Capacitance	C_{oss}			—	182	—
Reverse Transfer Capacitance	C_{rss}			—	160	—

Switching Parameters

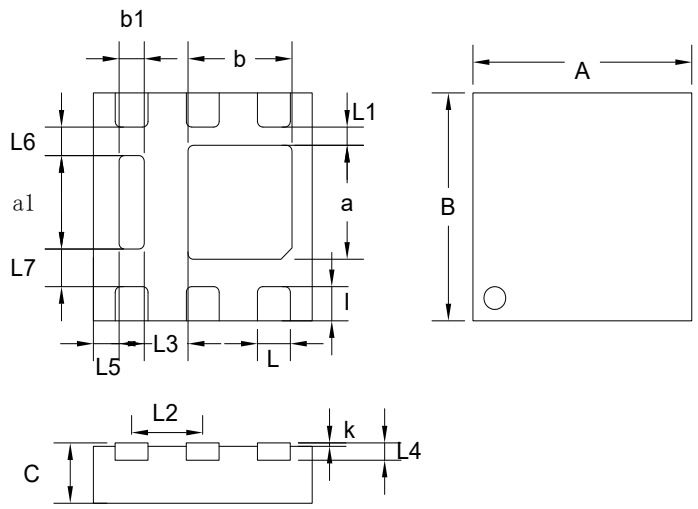
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=-4.5V, V_{DD}=-10V, I_D=-1A ,R_{GEN}=10Ω	nS	—	11	—
Turn-on Rise Time	t_r		nS	—	35	—
Turn-off Delay Time	$t_{D(off)}$		nS	—	30	—
Turn-off fall Time	t_f		nS	—	10	—
Total Gate Charge	Q_g	V_{DS}=-6V, I_D=-10A V_{GS}=-4.5V	nC	—	35	—
Gate-Source Charge	Q_{gs}		nC	—	5	—
Gate-Drain Charge	Q_{gd}		nC	—	10	—

Drian-Source Diode Characteristics

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage(3)	V_{SD}	I_S=-15A, V_{GS}=0V	V	—	—	-1.2
Maximum Body-Diode Continuous Current(2)	I_S	—	A	—	—	-15

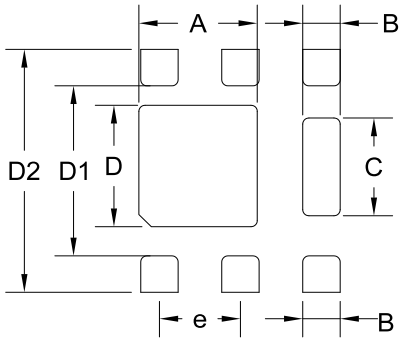
Note :
(1)Repetitive Rating: Pulse width limited by maximum junction temperature.
(2)Surface Mounted on FR4 Board, t ⩽ 10 sec.
(3)Pulse test: Pulse width ⩽ 300us, duty cycle ⩽ 2%.
(4)Guaranteed by design, not subject to production.

Package Outline Dimensions (DFN2020-6L)



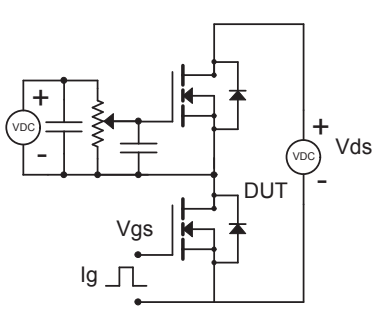
Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.924	2.076	0.076	0.082
B	1.924	2.076	0.076	0.082
C	0.70	0.80	0.028	0.031
L	0.25	0.35	0.010	0.014
L1	0.20MIN		0.008MIN	
L2	0.65 TYP		0.026 TYP	
L3	0.35TYP		0.014 TYP	
L4	0.203 TYP		0.008 TYP	
L5	0.12	0.32	0.005	0.013
L6	0.15	0.35	0.006	0.014
L7	0.25TYP		0.010TYP	
a	0.85	1.05	0.033	0.041
a1	0.46	0.66	0.018	0.026
b	0.80	1.0	0.031	0.039
b1	0.20	0.40	0.008	0.016
I	0.174	0.326	0.007	0.013
K	0	0.05	0	0.002

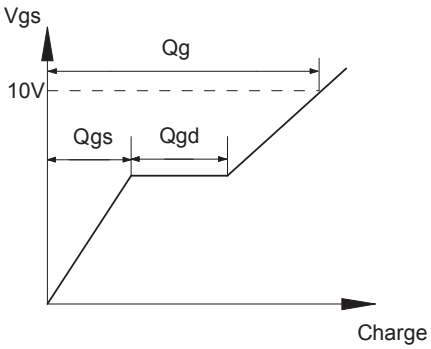
Suggested Pad Layout



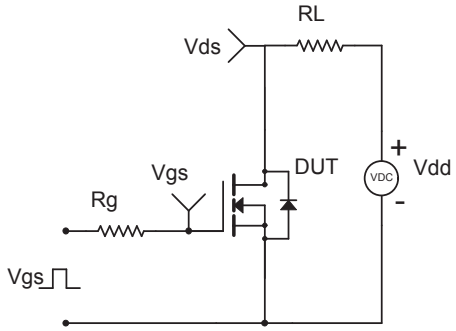
Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.10	0.035	0.043
B	0.30	0.50	0.012	0.020
C	0.56	0.76	0.022	0.030
D	0.95	1.15	0.037	0.045
D1	1.30	1.50	0.051	0.059
D2	2.20	2.40	0.087	0.094
e	0.55	0.75	0.022	0.030

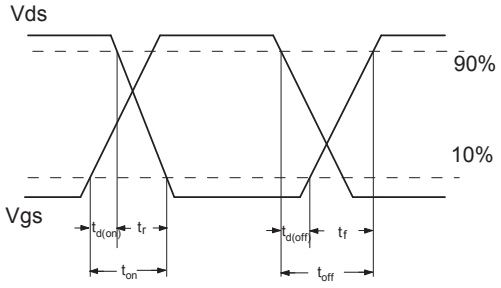
1.Gate Charge Test Circuit & Waveforms



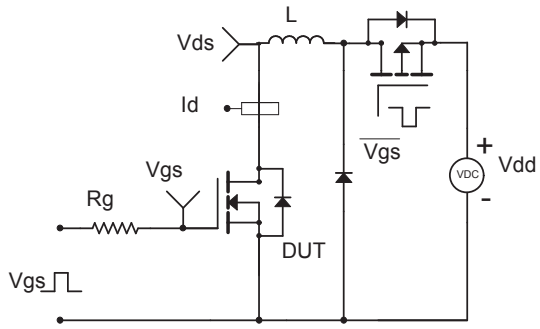


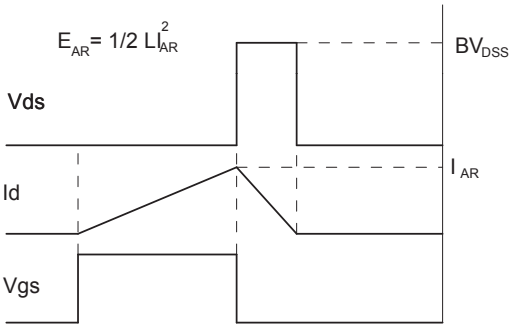
2. Resistive Switching Test Circuit & Waveforms





3.Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





4.Diode Recovery Test Circuit & Waveforms