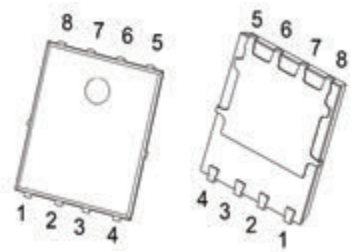
N-Channel MOSFET

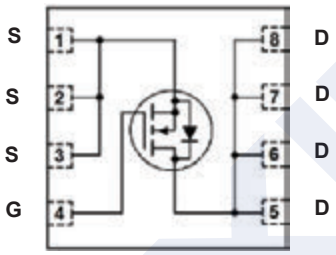
2KK5140DFN

PDFN5x6-8



■ Features

- $V_{DS\ (V)}$ = 20 V
- I_{DMAX} = 90 A
- $R_{DS(ON)}$ (at V_{GS} = 7.4 V) = 2.9 mΩ (Typ.)
- $R_{DS(ON)}$ (at V_{GS} = 4.5 V) = 3.2 mΩ (Typ.)
- $R_{DS(ON)}$ (at V_{GS} = 2.5 V) = 3.7 mΩ (Typ.)



■ Absolute Maximum Ratings (T_C = 25℃ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	
Continuous Drain Current (Note 1)	I_D	90	A
Pulsed Drain Current (Note 2)	I_{DP}	243	
Single Pulse Avalanche Energy	E_{AS}	280	mJ
Power Dissipation	P_D	83	W
Thermal Resistance, Junction- to-Case	$R_{\theta JC}$	1.8	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{stg}	-55 to 150	

Notes 1. The maximum current rating is package limited.

2. PW≤300μs.

N-Channel MOSFET

2KK5140DFN

■ Electrical Characteristics (T_A = 25℃ unless othewise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250 μA, V_{GS} = 0V	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±12 V			±100	nA
Gate to Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250μA	0.5		1.2	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 7.4 V, I_D = 30 A		2.9	3.7	mΩ
		V_{GS} = 4.5 V, I_D = 20 A		3.2	3.9	
		V_{GS} = 2.5 V, I_D = 20 A		3.7	6.1	
Forward Transconductance	g_{FS}	V_{DS} = 5 V, I_D = 20 A	20			S
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 10 V, f = 1 MHz		2016		pF
Output Capacitance	C_{oss}			391		
Reverse Transfer Capacitance	C_{rss}			130		
Total Gate Charge	Q_g	V_{GS} = 4.5V, V_{DS} = 10 V, I_D = 20 A		15		nC
Gate Source Charge	Q_{gs}			3		
Gate Drain Charge	Q_{gd}			4		
Turn-On DelayTime	$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 10 V, I_D = 20 A , R_{GEN} = 2.7 Ω,		6		ns
Turn-On Rise Time	t_r			4		
Turn-Off DelayTime	$t_{d(off)}$			31		
Turn-Off Fall Time	t_f			5		
Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 20 A			1.2	V

■ Marking

Marking	K5140 KC***

N-Channel MOSFET

2KK5140DFN

■ Typical Characterisitics

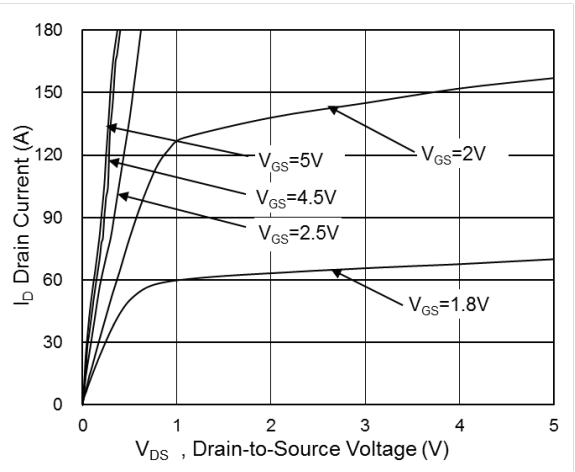


Fig.1 Typical Output Characteristics

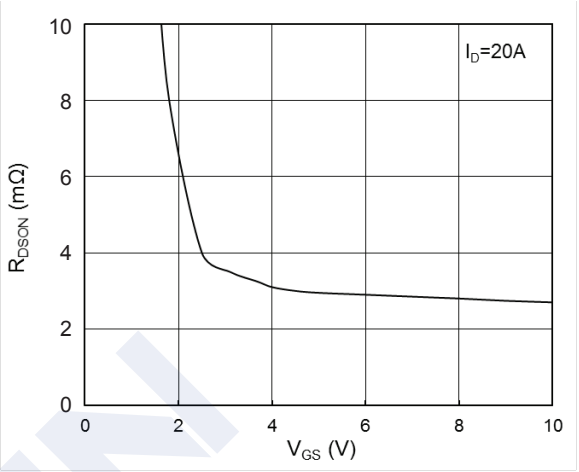


Fig.2 On-Resistance vs. Gate-Source Voltage

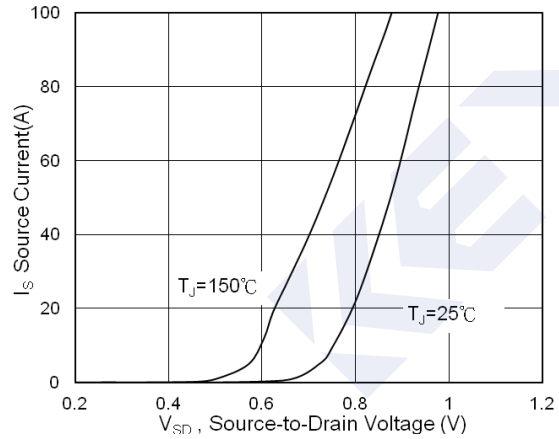


Fig.3 Forward Characteristics of Reverse

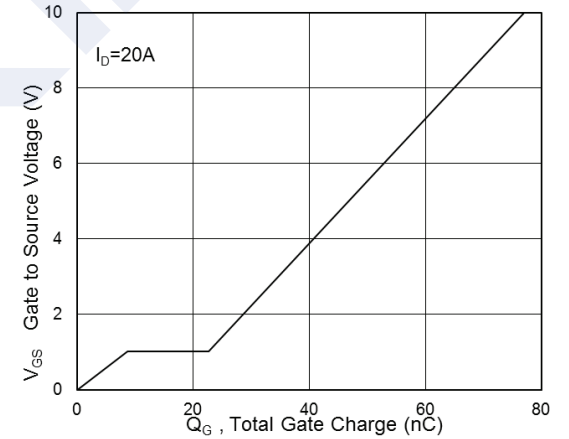


Fig.4 Gate-Charge Characteristics

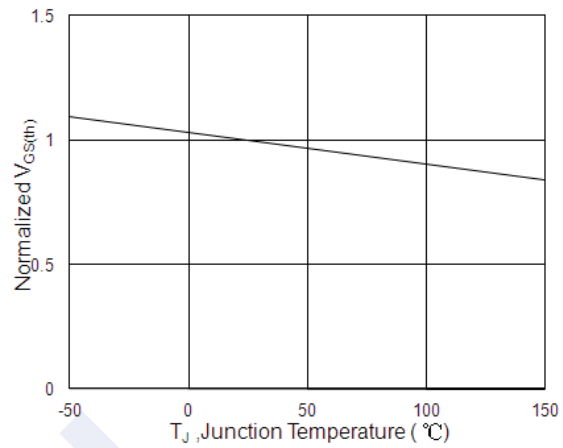


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

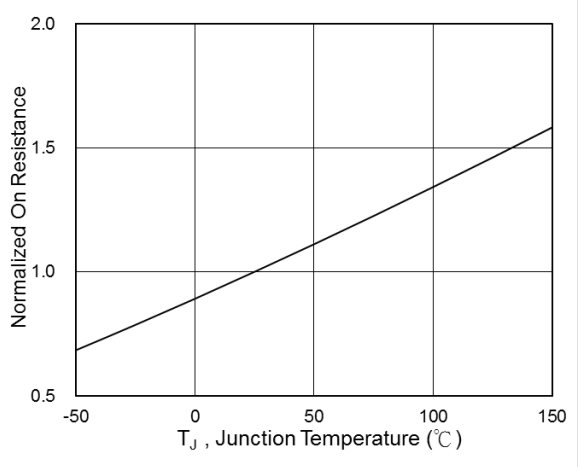


Fig.6 Normalized R_{DSON} vs. T_J

N-Channel MOSFET

2KK5140DFN

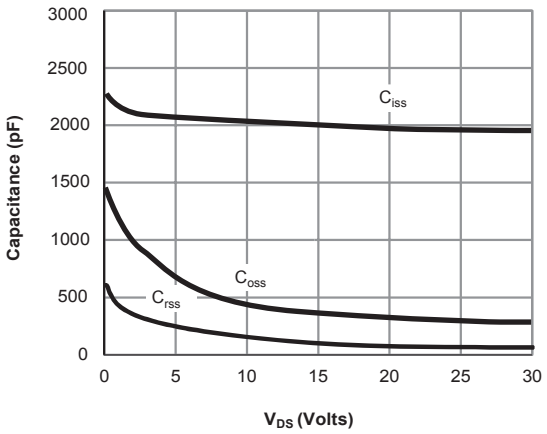


Fig.7 Capacitance

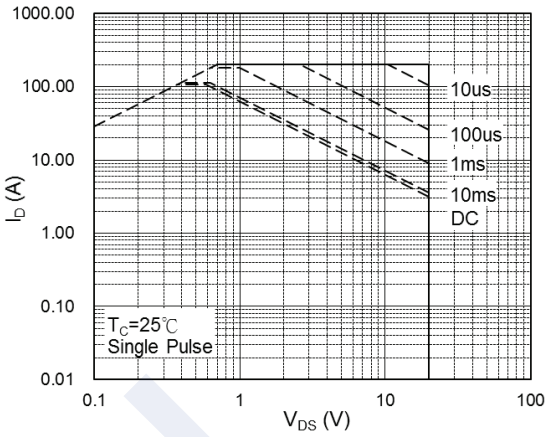


Fig.8 Safe Operating Area

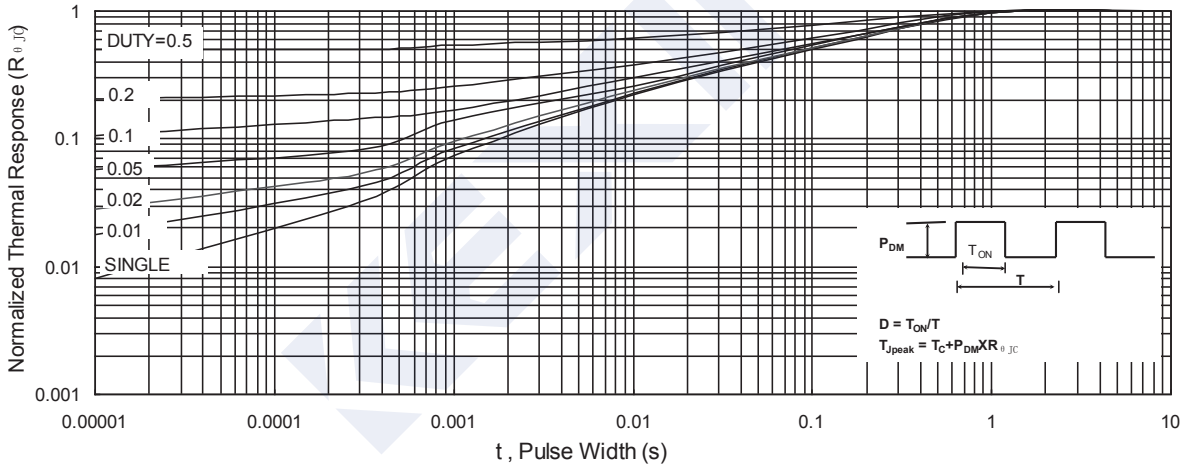


Fig.9 Normalized Maximum Transient Thermal Impedance

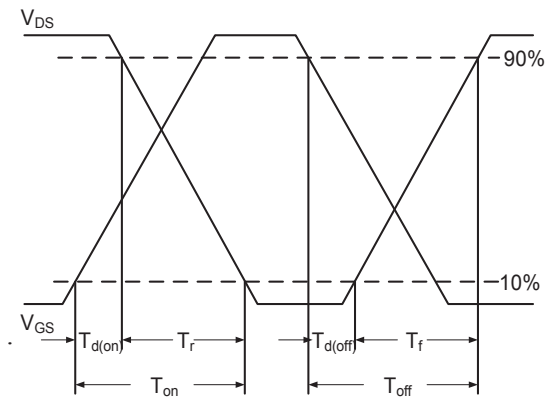


Fig.10 Switching Time Waveform

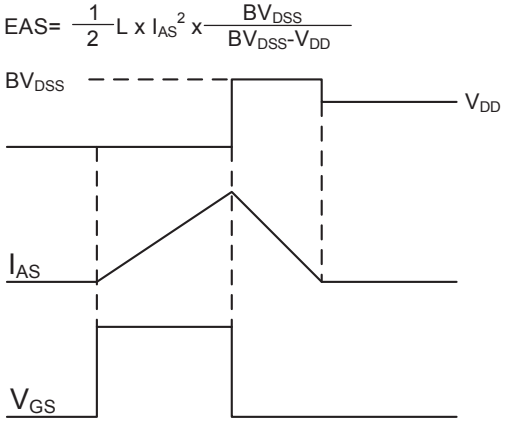
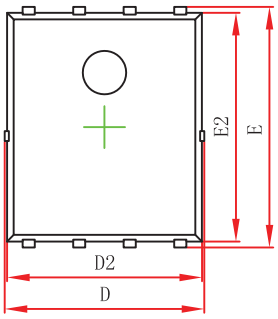


Fig.11 Unclamped Inductive Switching Waveform

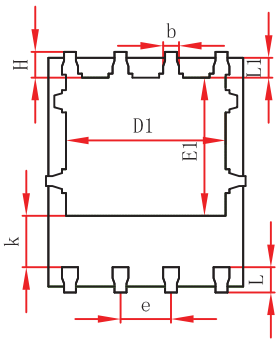
N-Channel MOSFET

2KK5140DFN

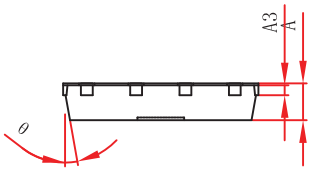
■ PDFN5x6-8 Package Outline Dimensions



Top View



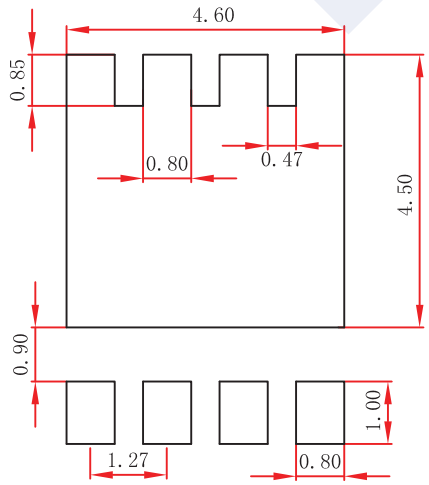
Bottom View



Side View

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°

■ PDFN5x6-8 Suggested Pad Layout



Note:
1.Controlling dimension: in millimeters.
2.General tolerance: ±0.05mm
3.The pad layout is for reference purposes only.