

P-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Low gate charge

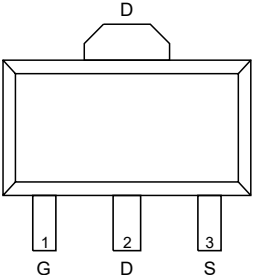
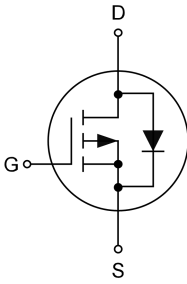
1.2 Applications

- ☒ Motor driver appliances
- ☒ Adapter appliances
- ☒ High power inverter system

1.3 Quick reference

- ☒ $BV \leq -100\text{ V}$
- ☒ $P_D \leq 1.56\text{ W}$
- ☒ $I_D \leq -5\text{ A}$
- ☒ $R_{DS(ON)} \leq 155\text{ m}\Omega @V_{GS} = -10\text{ V}$
- ☒ $R_{DS(ON)} \leq 185\text{ m}\Omega @V_{GS} = -4.5\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate		
2	Drain		
3	Source		

SOT-89

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_A=25^{\circ}\text{C}$	-100	-	V
V_{GS}	Gate-Source Voltage	$T_A=25^{\circ}\text{C}$	-	± 20	V
I_D	Drain Current (DC)	$T_A=25^{\circ}\text{C}$, $V_{GS}=-10\text{ V}$	-	-5	A
I_{DM}^*	Drain Current (Pulsed)	$T_A=25^{\circ}\text{C}$, $V_{GS}=-10\text{ V}$	-	-20	A
P_D	Drain power dissipation	$T_A=25^{\circ}\text{C}$	-	1.56	W
E_{AS}	Single Pulsed Avalanche Energy	$V_{DD}=-50\text{ V}$, $L=0.5\text{ mH}$	-	25	mJ
T_{stg}, T_J	Operating Junction and Storage Temperature Range		-55	150	$^{\circ}\text{C}$
I_S	Diode Forward Current	$T_A=25^{\circ}\text{C}$	-	-5	A
$R_{\theta JA}$	Thermal Resistance, Junction-Ambient		-	75	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction-Case		-	17	$^{\circ}\text{C/W}$

Notes:

* Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

** Mounted on PCB of 1 in^2 pad area.

4. Marking Information

Product Name	Marking
KJ05P10S	KJ05P10S XXXXXX

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ05P10S	SOT-89	7"	12 mm	1000

Note: KJ05P10S defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C)

6. Electrical Characteristics (T_C=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _{DS} =-250 μA	-100	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250 μA	-1.0	-	-2.5	V
I _{DSS}	Drain Leakage Current	V _{DS} =-80 V, V _{GS} =0 V	-	-	-1.0	μA
I _{GSS}	Gate Leakage Current	V _{DS} =0 V, V _{GS} =±20 V	-	-	±100	nA
R _{DS(ON)}	On-State Resistance	V _{GS} =-10 V, I _{DS} =-2 A	-	125	155	mΩ
		V _{GS} =-4.5 V, I _{DS} =-1 A	-	155	185	
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} =-2 A, V _{GS} =0 V	-	-	-1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =-2 A, dI _{SD} /dt=100 A/μs	-	39	-	ns
Q _{rr}	Reverse Recovery Charge		-	27	-	nC
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =-50 V, Frequency=1MHz	-	1447	-	pF
C _{oss}	Output Capacitance		-	54	-	
C _{rss}	Reverse Transfer Capacitance		-	32	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =-50 V, V _{GEN} =-10 V, R _G =4.5 Ω, R _L =25 Ω, I _{DS} =-2 A	-	9.4	-	ns
t _r	Turn-on Rise Time		-	16	-	
t _{d(off)}	Turn-off Delay Time		-	55	-	
t _f	Turn-off Fall Time		-	35	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =-50 V, V _{GS} =-10 V, I _{DS} =-2 A	-	26	-	nC
Q _{gs}	Gate-Source Charge		-	6	-	
Q _{gd}	Gate-Drain Charge		-	5	-	

7. Typical Characteristics

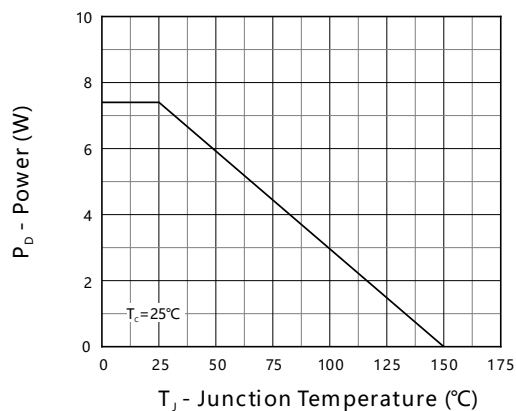


Fig 1. Power Dissipation

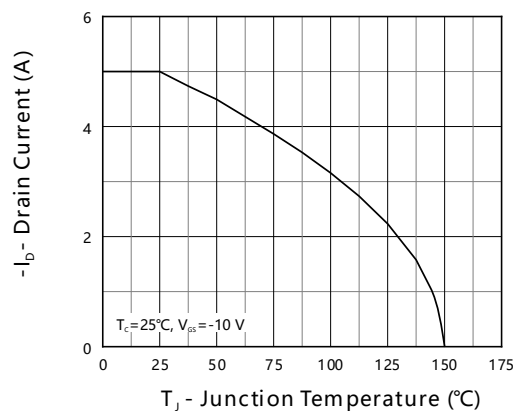


Fig 2. Current Capability

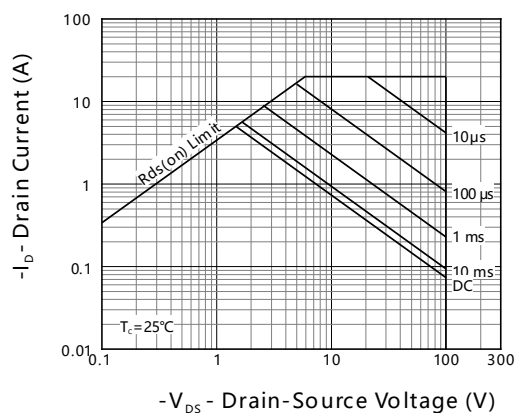


Fig 3. Safe Operation Area

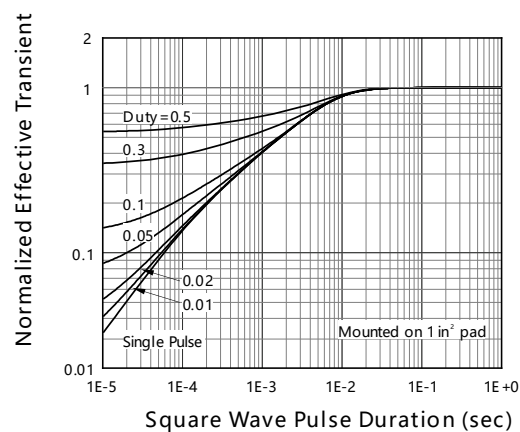


Fig 4. Transient Thermal Impedance

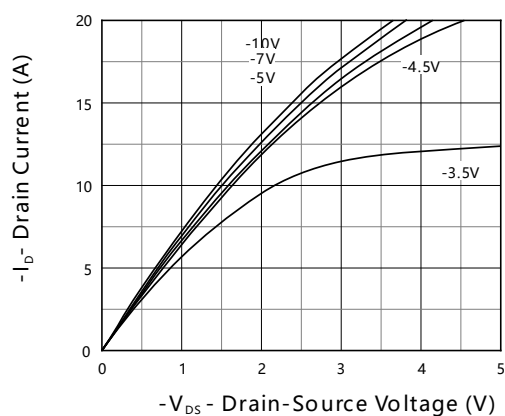


Fig 5. Output Characteristics

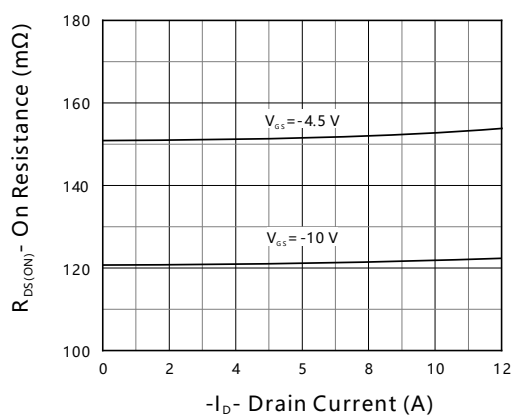


Fig 6. On Resistance

7. Typical Characteristics (cont.)

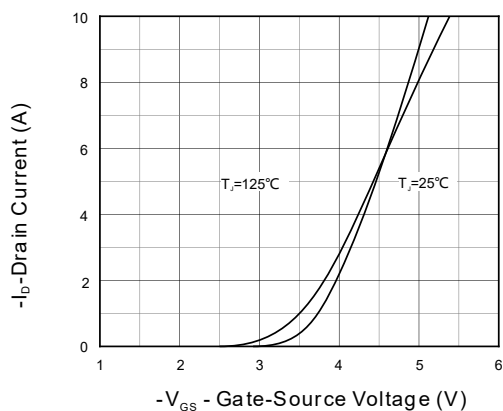


Fig 7. Transfer Characteristics

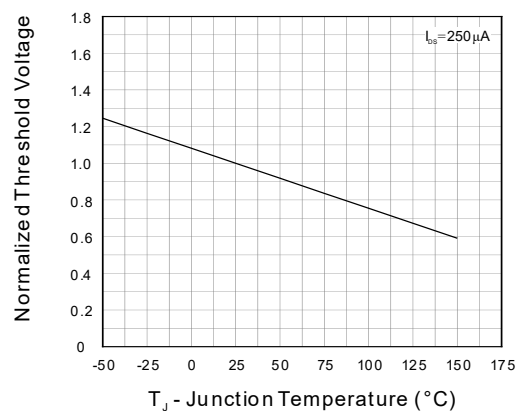


Fig 8. Normalized Threshold Voltage

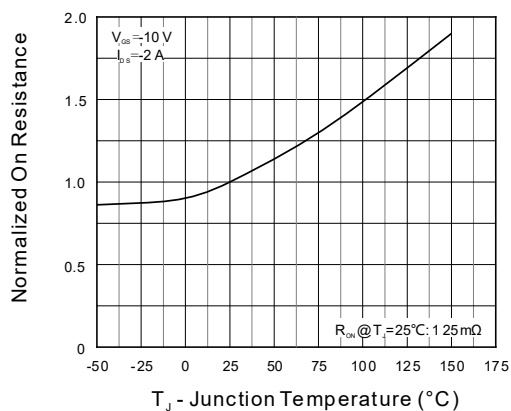


Fig 9. Normalized On Resistance

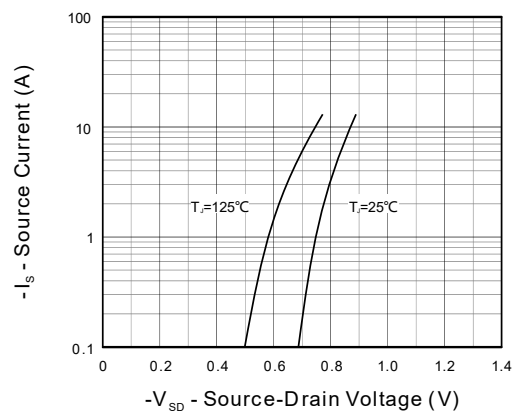


Fig 10. Diode Forward Current

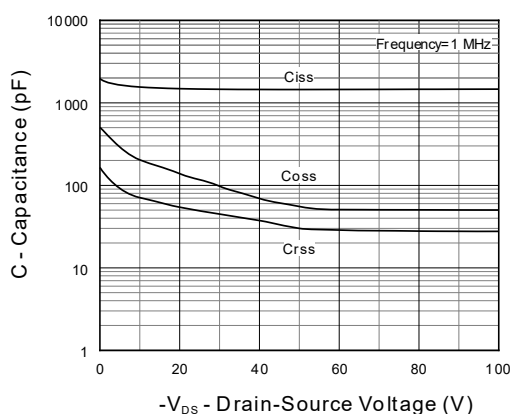


Fig 11. Capacitance

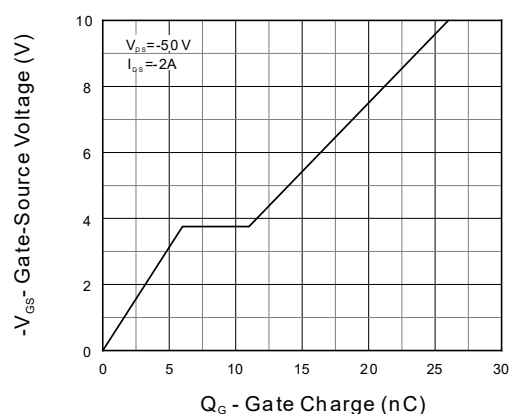
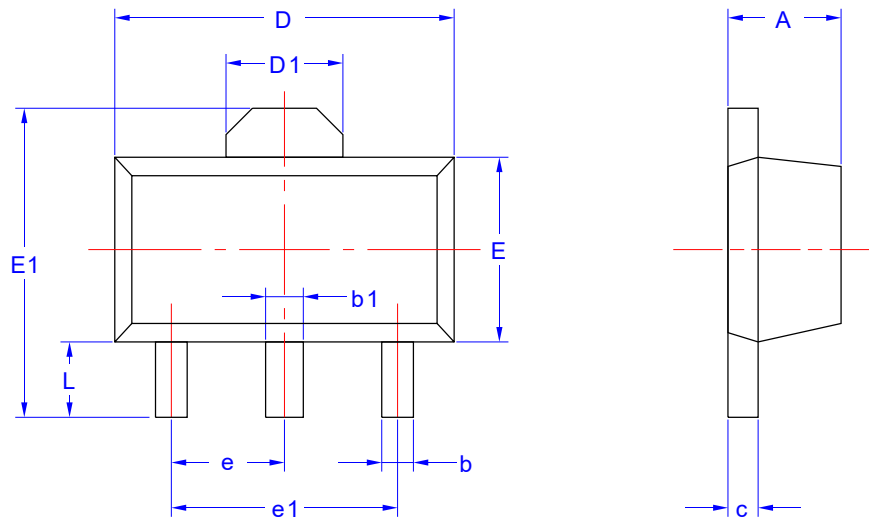


Fig 12. Gate Charge

8. Package Dimensions

SOT-89 Package



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	MIN	MAX	MIN	MAX
A	1.40	1.60	0.055	0.063
b	0.32	0.52	0.013	0.020
b1	0.40	0.58	0.016	0.023
c	0.35	0.44	0.014	0.017
D	4.40	4.60	0.173	0.181
D1	1.55 REF.		0.061 REF.	
E	2.30	2.60	0.091	0.102
E1	3.94	4.25	0.155	0.167
e	1.50 TYP.		0.060 TYP.	
e1	3.00 TYP.		0.118 TYP.	
L	0.90	1.20	0.035	0.047