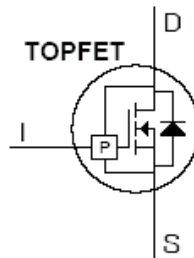
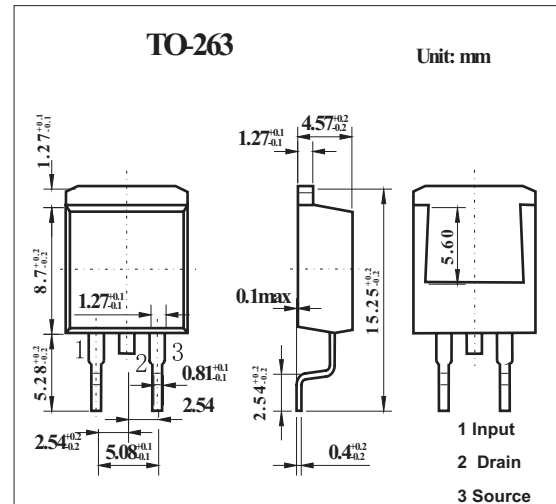


Logic level TOPFET

KUK128-50DL

■ Features

- TrenchMOS output stage
- Current limiting
- Overload protection
- Overtemperature protection
- Protection latched reset by input
- 5 V logic compatible input level
- Control of output stage and supply of overload protection circuits derived from input
- Low operating input current permits direct drive by micro-controller
- ESD protection on all pins
- Overvoltage clamping for turn off of inductive loads

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Continuous drain source voltage	V_{DS}	50	V
Continuous drain current $V_{IS} = 5\text{ V}$; $T_{mb} = 25^\circ\text{C}$	I_D	selflimited	A
Continuous drain current $V_{IS} = 5\text{ V}$; $T_{mb} \leq 125^\circ\text{C}$	I_D	8	A
Continuous input current	I_I	-5 to 5	mA
Repetitive peak input current $t_p \leq 1\text{ ms}$	I_{IRM}	-10 to 10	mA
Total power dissipation $T_{mb} \leq 25^\circ\text{C}$	P_D	40	W
Storage temperature	T_{stg}	-55 To 175	$^\circ\text{C}$
Continuous junction temperature normal operation	T_j	150	$^\circ\text{C}$
Case temperature during soldering	T_{sold}	260	$^\circ\text{C}$
Electrostatic discharge capacitor voltage *	V_C	2	kV

* $C = 250\text{ pF}$; $R = 1.5\text{ k}\Omega$

KUK128-50DL

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Non-repetitive clamping energy	EDSM	$I_{DM} = 8\text{ A}; V_{DD} \leq 20\text{ V}; T_{mb} \leq 25^\circ\text{C}$			100	mJ
Repetitive clamping energy	EDRM	$I_{DM} = 8\text{ A}; V_{DD} \leq 20\text{ V}; T_{mb} \leq 95^\circ\text{C}; f = 250\text{ Hz}$			20	mJ
Drain source voltage	V_{DS}	$4\text{ V} \leq V_{IS} \leq 5.5\text{ V}$	0		35	V
Drain-source clamping voltage	$V_{(CL)DSS}$	$V_{IS} = 0\text{ V}; I_D = 10\text{ mA}$	50			V
		$V_{IS} = 0\text{ V}; I_{DM} = 2\text{ A}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.01$	50	60	70	V
Drain source leakage current	I_{DSS}	$V_{DS} = 40\text{ V}$			100	μA
		$V_{DS} = 40\text{ V}; T_{mb} = 25^\circ\text{C}$		0.1	10	μA
Drain-source resistance	$R_{DS(ON)}$	$V_{IS} \geq 4.4\text{ V}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.01; I_{DM} = 3\text{ A}$			190	m Ω
		$V_{IS} \geq 4.4\text{ V}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.01; I_{DM} = 3\text{ A}; T_{mb} = 25^\circ\text{C}$		68	100	m Ω
		$V_{IS} \geq 4\text{ V}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.01; I_{DM} = 3\text{ A}$			200	m Ω
		$V_{IS} \geq 4\text{ V}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.01; I_{DM} = 3\text{ A}; T_{mb} = 25^\circ\text{C}$		72	105	m Ω
Drain current limiting	I_D	$V_{DS} = 13\text{ V}; V_{IS} = 5\text{ V}; T_{mb} = 25^\circ\text{C}$	8	12	16	A
		$V_{DS} = 13\text{ V}; 4.4\text{ V} \leq V_{IS} \leq 5.5\text{ V}$	6		18	A
		$V_{DS} = 13\text{ V}; 4\text{ V} \leq V_{IS} \leq 5.5\text{ V}$	5		18	A
Overload power threshold	$P_{D(TO)}$	device trips if $P_D > P_{D(TO)}$; $V_{IS} = 5\text{ V}; T_{mb} = 25^\circ\text{C}$	20	55	80	W
Characteristic time	T_{DSC}		200	350	600	μs
Threshold junction temperature	$T_{J(TO)}$		150	170		$^\circ\text{C}$
Input threshold voltage	$V_{IS(TO)}$	$V_{DS} = 5\text{ V}; I_D = 1\text{ mA}$	0.6		2.4	V
		$V_{DS} = 5\text{ V}; I_D = 1\text{ mA}; T_{mb} = 25^\circ\text{C}$	1.1	1.6	2.1	V
Input supply current	I_{IS}	normal operation; $V_{IS} = 5\text{ V}$	100	220	400	μA
		normal operation; $V_{IS} = 4\text{ V}$	80	195	330	
Input supply current	I_{ISL}	protection latched; $V_{IS} = 5\text{ V}$	200	400	650	
		protection latched; $V_{IS} = 3\text{ V}$	130	250	430	
Protection reset voltage	V_{ISR}	reset time $t_r \geq 100\text{ }\mu\text{s}$	1.5	2	2.9	V
Latch reset time	t_{lr}	$V_{IS1} = 5\text{ V}, V_{IS2} < 1\text{ V}$	10	40	100	μs
Input clamping voltage	$V_{(CL)IS}$	$I_I = 1.5\text{ mA}$	5.5		8.5	V
Input series resistance to gate of power MOSFET	R_{IG}	$I_I = 1.5\text{ mA}; T_{mb} = 25^\circ\text{C}$		33		k Ω
Turn-on delay time	$t_{d\text{ on}}$	$V_{IS} = 5\text{ V}$		8	20	μs
Rise time	t_r			20	50	
Turn-off delay time	$t_{d\text{ off}}$	$V_{IS} = 0\text{ V}$		25	70	
Fall time	t_f			16	40	
Junction to mounting base	$R_{th\text{ j-mb}}$			2.5	3.1	K/W
Junction to ambient	$R_{th\text{ j-a}}$	minimum footprint FR4 PCB		50		K/W