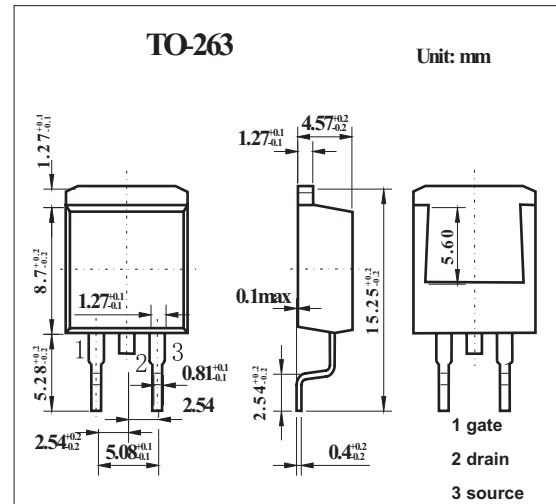


TrenchPLUS standard level FET

KUK7107-55AIE

■ Features

- Integrated temperature sensor
- ESD protection
- Q101 compliant
- Standard level compatible



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

Parameter	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	55	V
Drain-gate voltage $I_{DG} = 250 \mu\text{A}$	V_{DGR}	55	V
Gate-source voltage	V_{GS}	± 20	V
Drain current (DC) $T_{mb} = 25^\circ\text{C}, V_{GS} = 10 \text{ V}$	I_D	140	A
Drain current (DC) $T_{mb} = 100^\circ\text{C}, V_{GS} = 10 \text{ V}$	I_D	75	A
peak drain current *1	I_{DM}	560	A
Total power dissipation $T_{mb} = 25^\circ\text{C}$	P_{tot}	272	W
gate-source clamping current (continuous)	$I_{GS(CL)}$	10	mA
gate-source clamping current *3		50	mA
Storage & operating temperature	T_{stg}, T_j	-55 to 175	$^\circ\text{C}$
reverse drain current (DC) $T_{mb} = 25^\circ\text{C}$	I_{DR}	140	A
		75	A
pulsed reverse drain current *1	I_{DRM}	560	A
non-repetitive avalanche energy *2	$E_{DS(AL)S}$	460	J
electrostatic discharge voltage; all pins *4	V_{esd}	6	KV
Thermal resistance junction to mounting base	$R_{th j-mb}$	0.55	K/W
Thermal resistance junction to ambient	$R_{th j-a}$	50	K/W

* 1 $T_{mb} = 25^\circ\text{C}$; pulsed; $t_p \leq 10 \mu\text{s}$;

* 2 unclamped inductive load; $I_D = 68 \text{ A}; V_{DS} \leq 55 \text{ V}; V_{GS} = 10 \text{ V}; R_{GS} = 50 \Omega$; starting $T_j = 25^\circ\text{C}$

* 3 $t_p = 5 \text{ ms}; \delta = 0.01$

* 4 Human Body Model; $C = 100 \text{ pF}; R = 1.5 \text{ k}\Omega$

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■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
drain-source breakdown voltage	V _{(BR)DSS}	I _D = 0.25 mA; V _{GS} = 0 V; T _j = 25°C	55			V
		I _D = 0.25 mA; V _{GS} = 0 V; T _j = -55°C	50			V
gate-source threshold voltage	V _{GS(th)}	I _D = 1 mA; V _{DS} = V _{GS} ; T _j = 25°C	2	3	4	V
		I _D = 1 mA; V _{DS} = V _{GS} ; T _j = 175°C	1			V
		I _D = 1 mA; V _{DS} = V _{GS} ; T _j = -55°C			4.4	V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 55 V; V _{GS} = 0 V; T _j = 25°C		0.1	10	μA
		V _{DS} = 55 V; V _{GS} = 0 V; T _j = 175°C			250	μA
gate-source breakdown voltage	V _{(BR)GSS}	I _G = ±1 mA; -55°C < T _j < 175°C	20	22		V
gate-source leakage current	I _{GSS}	V _{GS} = ±10 V; V _{DS} = 0 V; T _j = 25°C		22	1000	nA
		V _{GS} = ±10 V; V _{DS} = 0 V; T _j = 175°C			10	μA
drain-source on-state resistance	R _{DS(on)}	V _{GS} = 10 V; I _D = 50 A; T _j = 25°C	.	5.8	7	mΩ
		V _{GS} = 10 V; I _D = 50 A; T _j = 175°C			14	mΩ
ratio of drain current to sense current	I _D /I _{sense}	V _{GS} > 10 V; -55°C < T _j < 175°C	450	500	550	
total gate charge	Q _{g(tot)}	V _{GS} = 10 V; V _{DD} = 44 V; I _D = 25 A		116		nC
gate-to-source charge	Q _{gs}			19		nC
gate-to-drain (Miller) charge	Q _{gd}			50		nC
input capacitance	C _{iss}	V _{GS} = 0 V; V _{DS} = 25 V; f = 1 MHz		4500		pF
output capacitance	C _{oss}			960		pF
reverse transfer capacitance	C _{rss}			510		pF
turn-on delay time	t _{d(on)}			36		ns
rise time	t _r	V _{DD} = 30 V; R _L = 1.2 Ω; V _{GS} = 10 V; R _G = 10 Ω		115		ns
turn-off delay time	t _{d(off)}			159		ns
fall time	t _f			111		ns
internal drain inductance	L _d	measured from upper edge of drain mounting base to center of die		2.5		nH
internal source inductance	L _s	measured from source lead to source bond pad		7.5		nH
source-drain (diode forward) voltage	V _{SD}	I _s = 25A; V _{GS} = 0 V		0.85	1.2	V
reverse recovery time	t _{rr}	I _s = 20 A; diF/dt = -100 A/μs;		80		ns
recovered charge	Q _r	V _{GS} = -10 V; V _{DS} = 30 V		200		nC