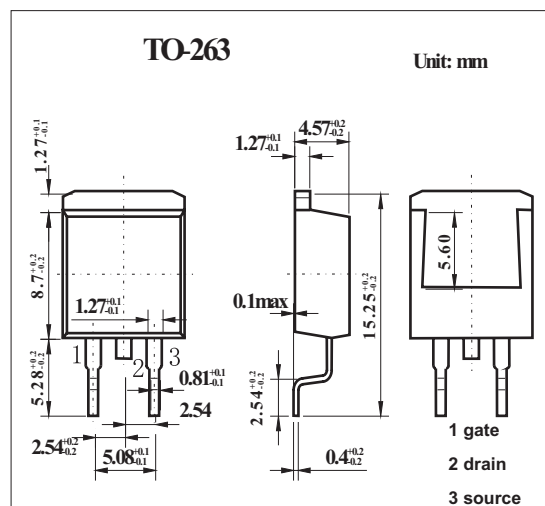


TrenchPLUS standard level FET

KUK7105-40AIE

■ Features

- Integrated temperature sensor
- Electrostatic discharge protection
- Q101 compliant
- Standard level compatible.

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

Parameter	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	40	V
Drain-gate voltage $R_{GS} = 20\text{ K}\Omega$	V_{DGS}	40	V
Gate-source voltage	V_{GS}	± 20	V
Drain current (DC) $T_{mb} = 25^\circ\text{C}, V_{GS} = 10\text{ V}$	I_D	155	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}	620	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}	155	A
		75	A
pulsed reverse drain current *1	I_{DRM}	620	A
non-repetitive avalanche energy *2	$EDS(AL)S$	1.46	J
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; $t_p \leq 10\text{ }\mu\text{s}$;

*2 unclamped inductive load; $I_D = 75\text{ A}$; $V_{DS} \leq 40\text{ V}$; $V_{GS} = 10\text{ V}$; $R_{GS} = 50\Omega$; starting $T_j = 25^\circ\text{C}$

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

KUK7105-40AIE

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 0.25 \text{ mA}; V_{GS} = 0 \text{ V}; T_J = 25^\circ\text{C}$	40			V
		$I_D = 0.25 \text{ mA}; V_{GS} = 0 \text{ V}; T_J = -55^\circ\text{C}$	36			V
gate-source threshold voltage	$V_{GS(th)}$	$I_D = 1 \text{ mA}; V_{DS} = V_{GS}; T_J = 25^\circ\text{C}$	2	3	4	V
		$I_D = 1 \text{ mA}; V_{DS} = V_{GS}; T_J = 175^\circ\text{C}$	1			V
		$I_D = 1 \text{ mA}; V_{DS} = V_{GS}; T_J = -55^\circ\text{C}$			4.4	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 40 \text{ V}; V_{GS} = 0 \text{ V}; T_J = 25^\circ\text{C}$		0.1	10	μA
		$V_{DS} = 40 \text{ V}; V_{GS} = 0 \text{ V}; T_J = 175^\circ\text{C}$			250	μA
gate-source breakdown voltage	$V_{(BR)GSS}$	$I_G = \pm 1 \text{ mA}; -55^\circ\text{C} < T_J < 175^\circ\text{C}$	20	22		V
gate-source leakage current	I_{GSS}	$V_{GS} = \pm 10 \text{ V}; V_{DS} = 0 \text{ V}; T_J = 25^\circ\text{C}$		22	1000	nA
		$V_{GS} = \pm 10 \text{ V}; V_{DS} = 0 \text{ V}; T_J = 175^\circ\text{C}$			10	μA
drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10 \text{ V}; I_D = 50 \text{ A}; T_J = 25^\circ\text{C}$	.	4.5	5	m Ω
		$V_{GS} = 10 \text{ V}; I_D = 50 \text{ A}; T_J = 175^\circ\text{C}$			9.5	m Ω
drain-Isense on-state resistance	$R_{D(Is)on}$	$V_{GS} = 10 \text{ V}; I_D = 100 \text{ mA}; T_J = 25^\circ\text{C}$	0.98	1.08	1.18	Ω
		$V_{GS} = 10 \text{ V}; I_D = 100 \text{ mA}; T_J = 175^\circ\text{C}$	1.86	2.05	2.24	Ω
ratio of drain current to sense current	I_D/I_{sense}	$V_{GS} > 10 \text{ V}; -55^\circ\text{C} < T_J < 175^\circ\text{C}$	450	500	550	
total gate charge	$Q_{g(tot)}$	$V_{GS} = 10 \text{ V}; V_{DD} = 32 \text{ V}; I_D = 25 \text{ A}$		120	127	nC
gate-to-source charge	Q_{gs}			19	22	nC
gate-to-drain (Miller) charge	Q_{gd}			50	60	nC
input capacitance	C_{iss}	$V_{GS} = 0 \text{ V}; V_{DS} = 25 \text{ V}; f = 1 \text{ MHz}$		4300	5000	pF
output capacitance	C_{oss}			1400	1670	pF
reverse transfer capacitance	C_{rss}			820	1100	pF
turn-on delay time	$t_{d(on)}$	$V_{DD} = 30 \text{ V}; R_L = 1.2\Omega; V_{GS} = 10 \text{ V}; R_G = 10\Omega$		35		ns
rise time	t_r			115		ns
turn-off delay time	$t_{d(off)}$			155		ns
fall time	t_f			110		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}	$I_s = 25 \text{ A}; V_{GS} = 0 \text{ V}$		0.85	1.2	V
reverse recovery time	t_{rr}	$I_s = 20 \text{ A}; di_F/dt = -100 \text{ A}/\mu\text{s};$		96		ns
recovered charge	Q_r	$V_{GS} = -10 \text{ V}; V_{DS} = 30 \text{ V}$		224		nC