

Silicon-based N-channel LDMOS Transistor

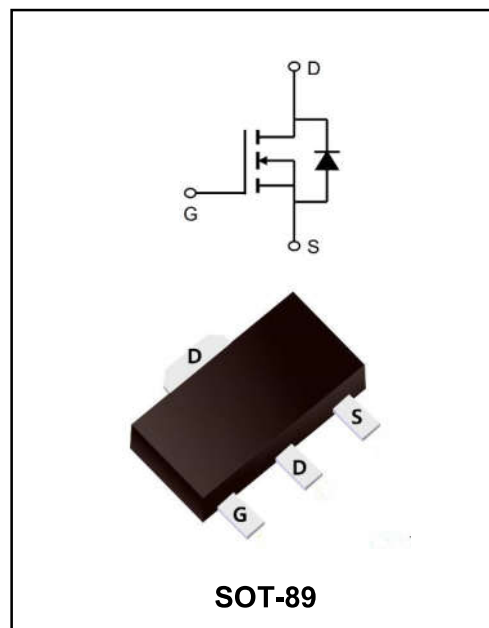
OVERVIEW AND FEATURES

- ♦Fast switching speed
- ♦Parallel operation available
- ♦Simple driving circuit
- ♦Case: SOT-89

The 2SK3078 is a silicon-based N-channel LDMOS transistor, which is mainly used in high-frequency electronic amplification circuits and can be a substitute for Toshiba 2SK3078.

TYPICAL PARAMETERS

- ♦Output Power: $P_O = 28.5 \text{ dBmW}$ (TYP)
- ♦Gain: $G_P = 12.5 \text{ dB}$ (Min.)
- ♦Drain Efficiency: $\eta_D = 55\%$ (Typ)



Marking Code	
2SK3078SI	H3

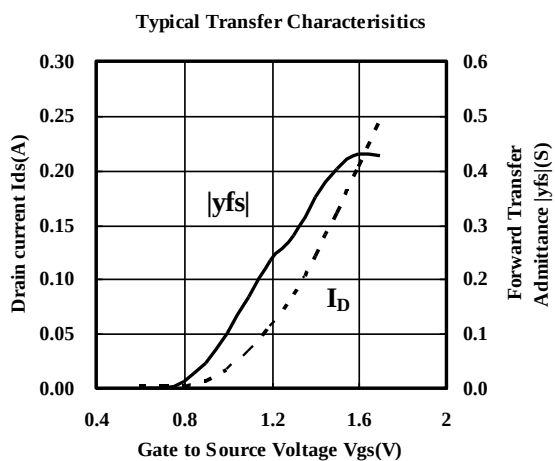
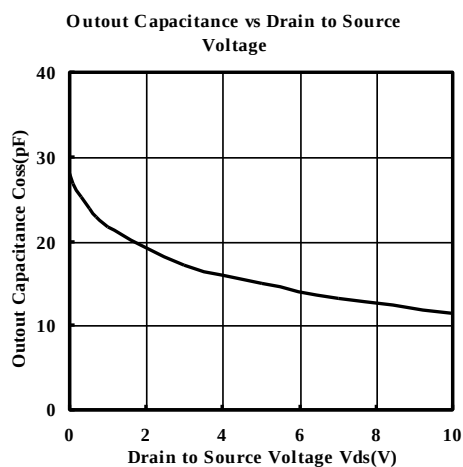
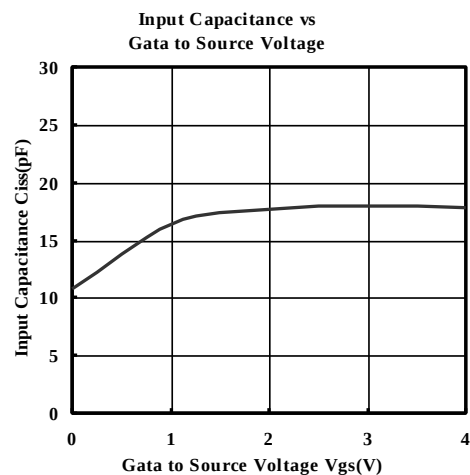
ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	12	V
Gate-Source Voltage	V_{GS}	5	V
Drain Current	I_D	0.5	A
Power Dissipation	P_D	3.0	W
Operating Junction Temperature Range	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$

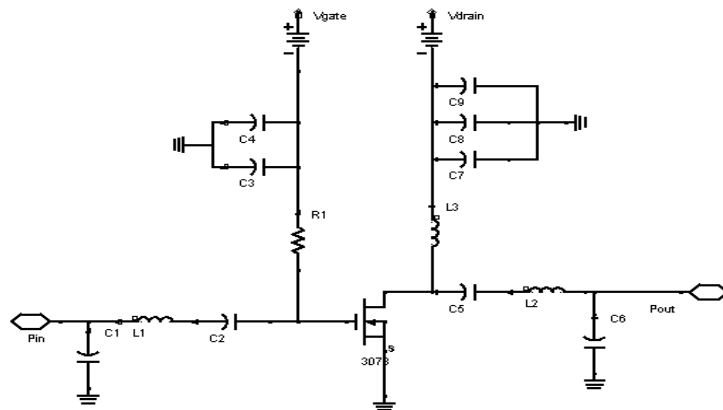
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

Parameter	Test Condition	Symbol	Min	Typ	Max	Unit
Threshold Voltage	$V_{DS} = 5V, I_D = 0.5\text{mA}$	$V_{GS(th)}$	0.6	0.8	1.2	V
Drain-Source Leakage Current	$V_{DS} = 10V, V_{GS} = 0V$	I_{DSS}			10	μA
Gate-Source Leakage Current	$V_{GS} = 5V$	I_{GSS}			5	μA
Operating Voltage	$f = 450\text{MHz}, I_{DS} = 100\text{mA}, P_i = 15\text{dBmW}$	V_{DS}		5	8.4	V
Gate Operating Voltage	$V_{DS} = 5V, f = 500\text{MHz}, I_{DS} = 100\text{mA}, P_i = 15\text{dBmW}$	$V_{GS} \text{ (TYP)}$	0.8	1.3	1.5	V
Output Power	$V_{DS} = 5V, f = 450\text{MHz}, I_{DS} = 100\text{mA}, V_{GS} \text{ (TYP)} = 1.30V, P_i = 15\text{dBmW}$	P_O	27.5	28.5		dBmW
Drain Efficiency		η_D	45	55		%
Output Power		P_O	0.56	0.71		W
Power Gain		G_P	12.5	13.5		dB

Characteristic Curve



Application Circuit Diagram and RF Parameters

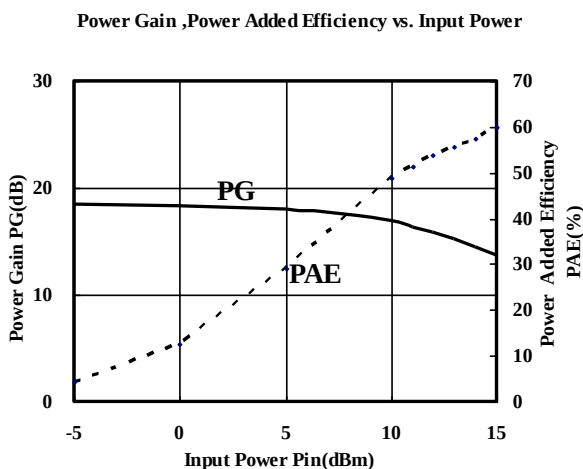
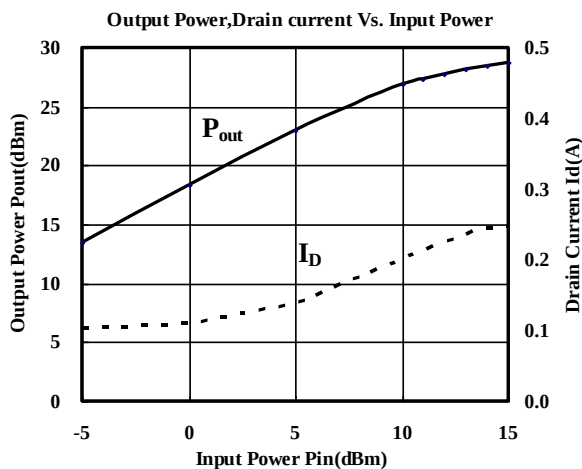


400MHz–470MHz Application Circuit Diagram

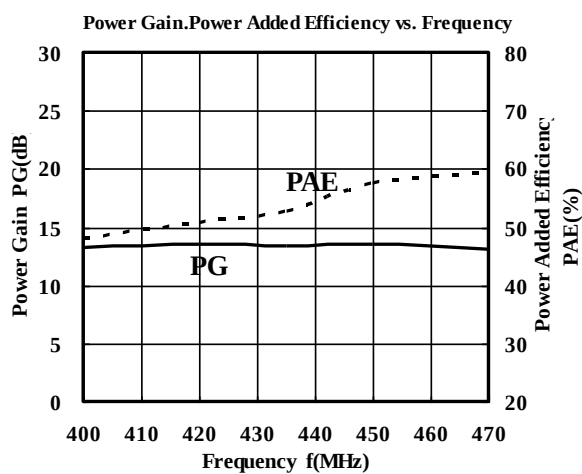
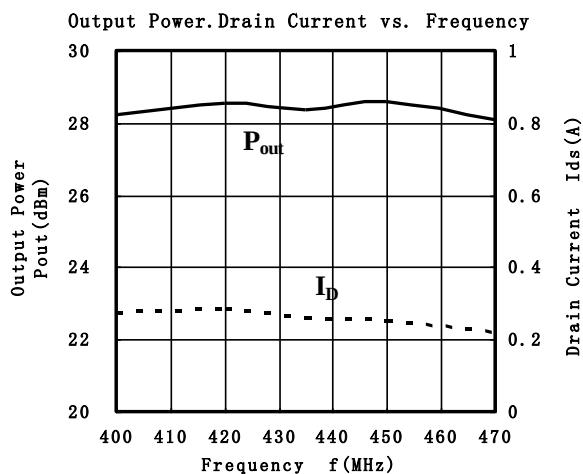
Component Values:

Component Name	Component Value	Unit
C1	10	pF
C2,C5	100	pF
C3,C7	1000	pF
C4,C8	10000	pF
C6	12	pF
C9	4.7	μF
R1	360	Ω
L1	10	nH
L2	3.3	nH
L3	5-turn coil, Φ=2mm	

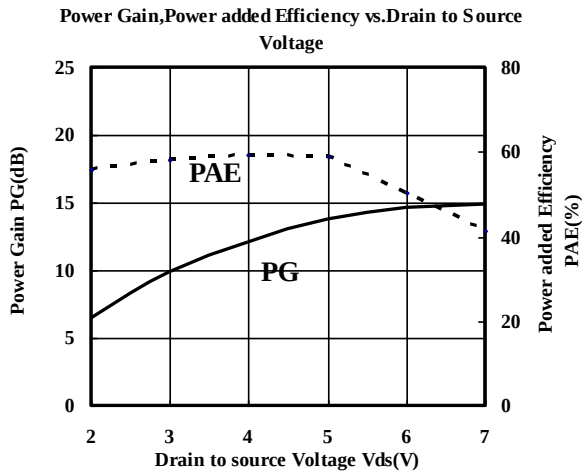
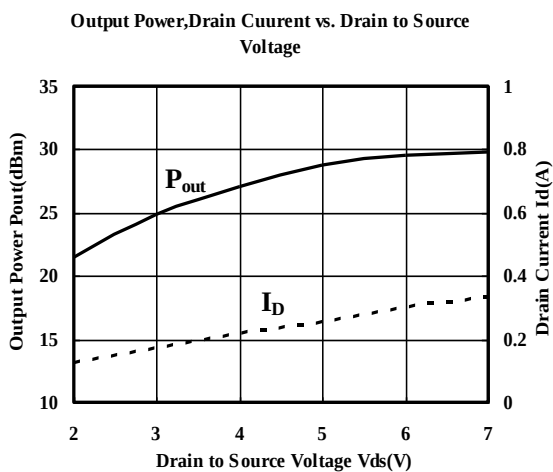
$f=450\text{MHz}$, $V_{DS}=5\text{V}$, $I_{DQ}=100\text{mA}$, $V_{GS}(\text{TYP})=1.30\text{V}$



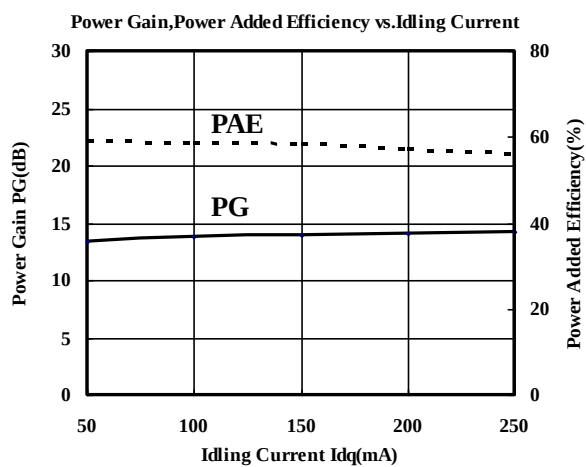
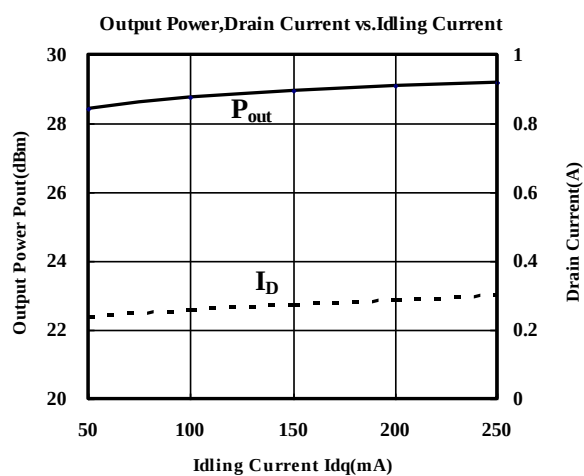
$V_{DS}=5\text{V}$, $I_{DQ}=100\text{mA}$, $P_{in}=15\text{dBm}$



$f=450\text{MHz}$, $I_{DQ}=100\text{mA}$, $P_{in}=15\text{dBm}$



$f=450\text{MHz}$, $V_{ds}=5\text{V}$, $P_{in}=15\text{dBm}$



Ordering information

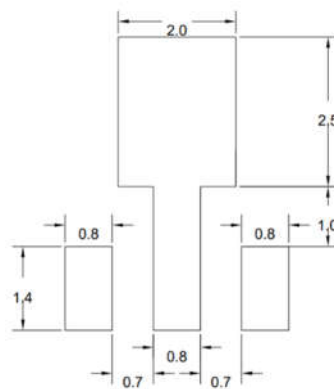
Package	Packing Description	Base Quantity	Packing Quantity
SOT-89	Tape/Reel, 7" reel	1000pcs/Reel	6000PCS/Box 30000PCS/Carton

Package Dimensions

SOT-89

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	1.40	1.60	0.055	0.063
b	0.32	0.52	0.013	0.020
b1	0.38	0.58	0.015	0.023
c	0.35	0.45	0.014	0.018
D	4.40	4.60	0.173	0.181
D1	1.45	1.65	0.057	0.065
D2	1.70	1.80	0.067	0.071
E	2.30	2.60	0.091	0.102
E1	3.95	4.25	0.156	0.167
E2	1.80	2.00	0.071	0.079
e	1.40	1.60	0.055	0.063
e1	2.80	3.20	0.110	0.126
L	0.90	1.20	0.035	0.047

The recommended mounting pad size



UNIT:MM

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