

P-Channel Enhancement-Mode MOS Transistors, VP0610 Series



VP0610E / VP0610L / VP0610T

FEATURES

- P-Channel Equivalent to 2N7000 Series
- Available in Surface Mount SOT-23
- Low $r_{DS(on)}$ $<10\Omega$
- By 60V

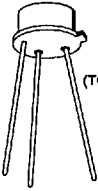
APPLICATIONS

- Switching
- Amplification

ORDERING INFORMATION


Part	Package	Temperature Range
VP0610E	Hermetic TO-206AC	-55°C to +150°C
VP0610L	Plastic TO-92	-55°C to +150°C
VP0610T	Surface Mount SOT-23	-55°C to +150°C
XVP0610	Sorted chips in carriers	-55°C to +150°C

PIN CONNECTIONS




TO-52
(TO-206AC)

BOTTOM VIEW




1 SOURCE
2 GATE
3 DRAIN & CASE

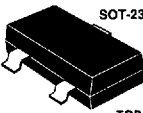


TO-92
(TO-226AA)

BOTTOM VIEW

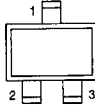


1 SOURCE
2 GATE
3 DRAIN



SOT-23

TOP VIEW



1 DRAIN
2 SOURCE
3 GATE

PRODUCT MARKING

VP0610T	V06
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CD7

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

SYMBOL	PARAMETERS/TEST CONDITIONS	LIMITS			UNITS
		VP0610E ²	VP0610L	VP0610T	
V_{DS}	Drain-Source Voltage	-60	-60	-60	V
V_{GS}	Gate-Source Voltage ²	± 20	± 30	± 30	
I_D	Continuous Drain Current	$T_A = 25^\circ\text{C}$ -0.25	-0.18	-0.12	A
		$T_A = 100^\circ\text{C}$ -0.15	-0.11	-0.07	
I_{DM}	Pulsed Drain Current ¹	-1	-0.8	-0.4	
P_D	Power Dissipation	$T_A = 25^\circ\text{C}$ 1.5	0.80	0.36	W
		$T_A = 100^\circ\text{C}$ 0.6	0.32	0.14	
T_J, T_{stg}	Operating Junction & Storage Temperature Range	-55 to 150			°C
T_L	Lead Temperature (1/16" from case for 10 sec.)	300			

THERMAL RESISTANCE RATINGS

SYMBOL	THERMAL RESISTANCE	LIMITS			UNITS
		VP0610E	VP0610L	VP0610T	
R_{thJA}	Junction-to-Ambient	400	156	350	°C/W

¹Pulse width limited by maximum junction temperature.

²Reference T_c for all tests.

ELECTRICAL CHARACTERISTICS ^a			LIMITS						UNITS	TEST CONDITIONS
SYMBOL	PARAMETER	TYP ^b	VP0610E		VP0610L		VP0610T			
			MIN	MAX	MIN	MAX	MIN	MAX		
STATIC										
V _{(BR)DSS}	Drain-Source Breakdown Voltage	-70	-60		-60		-60		V	V _{GS} = 0V, I _D = -10μA
V _{GS(th)}	Gate Threshold Voltage	-2	-1	-3.5	-1	-3.5	-1	-3.5		V _{DS} = V _{GS} , I _D = -1mA
I _{GSS}	Gate-Body Leakage	±1		±10		±10		±10	nA	V _{DS} = 0V, V _{GS} = ±20V T _J = 125°C
I _{DSS}	Zero Gate Voltage Drain Current	-0.02		-1		-1		-1	μA	V _{DS} = -48V, V _{GS} = 0V T _J = 125°C
		-0.2		-200		-200		-200		
I _{D(ON)}	On-State Drain Current ^c	-700	-600		-600		-220		mA	V _{DS} = -10V, V _{GS} = -10V
r _{DS(ON)}	Drain-Source On-Resistance ^c	8		10		10		10	Ω	V _{GS} = -10V, I _D = -0.5A T _J = 125°C
		15		20		20		20		
g _{FS}	Forward Transconductance ^c	135	80		80		70		mS	V _{DS} = -10V, I _D = -0.5A
g _{OS}	Common Source Output Conductance ^c	400							μS	V _{DS} = -10V, I _D = -0.2A
DYNAMIC										
C _{iss}	Input Capacitance	15		60		60		60	pF	V _{DS} = -25V, V _{GS} = 0V, f = 1MHz
C _{oss}	Output Capacitance	10		25		25		25		
C _{rss}	Reverse Transfer Capacitance	3		5		5		5		
SWITCHING										
t _{d(ON)}	Turn-On Time	6		10		10		10	ns	V _{DD} = -25V, R _L = 133Ω, I _D = -0.18A V _{GEN} = -10V, R _G = 25Ω (Switching time is essentially independent of operating temperature)
t _r		10		15		15		15		
t _{d(OFF)}	Turn-Off Time	7		15		15		15		
t _f		8		20		20		20		

Notes:

- T_A = 25°C unless otherwise noted T_C = 25°C for VP0610E.
- For design aid only, not subject to production testing.
- Pulse test; PW = 300μs, duty cycle ≤2%.