

TP0610 SERIES



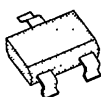
P-Channel Enhancement-Mode MOS Transistors

PRODUCT SUMMARY

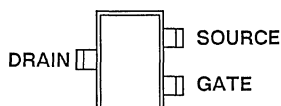
PART NUMBER	$V_{(BR)DSS}$ (V)	$r_{DS(ON)}$ (Ω)	I_D (A)	PACKAGE
TP0610E	-60	10	-0.25	TO-206AC
TP0610L	-60	10	-0.18	TO-92
TP0610T	-60	10	-0.12	SOT-23

Performance Curves: VPDS06 (See Section 7)

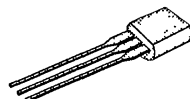
SOT-23



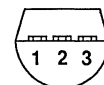
TOP VIEW



TO-92

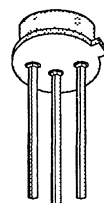


BOTTOM VIEW



- 1 SOURCE
- 2 GATE
- 3 DRAIN

TO-206AC (TO-52)



BOTTOM VIEW



- 1 SOURCE
- 2 GATE
- 3 DRAIN & CASE

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

PARAMETERS/TEST CONDITIONS		SYMBOL	TP0610E ²	TP0610L	TP0610T	UNITS
Drain-Source Voltage		V _{DS}	−60	−60	−60	V
Gate-Source Voltage		V _{GS}	±20	±30	±30	
Continuous Drain Current	T _A = 25°C	I _D	−0.25	−0.18	−0.12	A
	T _A = 100°C		−0.15	−0.11	−0.07	
Pulsed Drain Current ¹		I _{DM}	−1	−0.8	−0.4	
Power Dissipation	T _A = 25°C	P _D	1.5	0.80	0.36	W
	T _A = 100°C		0.60	0.32	0.14	
Operating Junction and Storage Temperature		T _J , T _{stg}	−55 to 150			°C
Lead Temperature (1/16" from case for 10 seconds)		T _L	300			

THERMAL RESISTANCE

THERMAL RESISTANCE	SYMBOL	TP0610E	TP0610L	TP0610T	UNITS
Junction-to-Ambient	R_{thJA}	400	156	350	$^\circ\text{C/W}$

¹Pulse width limited by maximum junction temperature

²Reference T_C for all temperature testing

ELECTRICAL CHARACTERISTICS ¹				LIMITS				
PARAMETER	SYMBOL	TEST CONDITIONS	TYP ²	TP0610E		TP0610L		UNIT
				MIN	MAX	MIN	MAX	
STATIC								
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = -10 μA	-70	-60		-60		V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -1 mA	-1.7	-1	-2.4	-1	-2.4	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V V _{GS} = ±20 V T _J = 125°C	± 1 ± 5		±10 ±50		±10 ±50	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -48 V V _{GS} = 0 V T _J = 125°C	-0.02 -0.2		-1 -200		-1 -200	μA
On-State Drain Current ³	I _{D(ON)}	V _{DS} = -10 V, V _{GS} = -4.5 V	-80	-50		-50		mA
Drain-Source On-Resistance ³	r _{DS(ON)}	V _{GS} = -4.5 V, I _D = -25 mA	11		25		25	Ω
		V _{GS} = -10 V I _D = -0.5 A T _J = 125°C	8 15		10 20		10 20	
Forward Transconductance ³	g _{FS}	V _{DS} = -10 V, I _D = -0.5 A	135	80		80		mS
Common Source Output Conductance ³	g _{OS}	V _{DS} = -10 V, I _D = -0.1 A	400					μS
DYNAMIC								
Input Capacitance	C _{iss}	V _{DS} = -25 V V _{GS} = 0 V f = 1 MHz	15		60		60	pF
Output Capacitance	C _{oss}		10		25		25	
Reverse Transfer Capacitance	C _{rss}		3		5		5	
SWITCHING								
Turn-On Time	t _{d(ON)}	V _{DD} = -25 V, R _L = 133 Ω I _D = -0.18 A, V _{GEN} = -10 V R _G = 25 Ω	6		10		10	ns
	t _r		10		15		15	
Turn-Off Time	t _{d(OFF)}	(Switching time is essentially independent of operating temperature)	7		15		15	
	t _f		8		20		20	

NOTES: 1. $T_A = 25^\circ\text{C}$ unless otherwise noted, $T_C = 25^\circ\text{C}$ for TP0610E.

2. For design aid only, not subject to production testing.

3. Pulse test; $PW = 300 \mu\text{s}$, duty cycle $\leq 2\%$.

TP0610 SERIES



ELECTRICAL CHARACTERISTICS ¹				LIMITS		
PARAMETER	SYMBOL	TEST CONDITIONS	TYP ²	TP0610T		UNIT
				MIN	MAX	
STATIC						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = -10 μA	-70	-60		V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -1 mA	-1.7	-1	-2.4	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V	± 1		± 10	nA
		V _{GS} = ± 20 V T _J = 125° C	± 5		± 50	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -48 V	-0.02		-1	μA
		V _{GS} = 0 V T _J = 125° C	-0.2		-200	
On-State Drain Current ³	I _{D(ON)}	V _{DS} = -10 V, V _{GS} = -4.5 V	-80	-50		mA
Drain-Source On-Resistance ³	r _{DS(ON)}	V _{GS} = -4.5 V, I _D = -25 mA	11		25	Ω
		V _{GS} = -10 V	6		10	
		I _D = -0.2 A T _J = 125° C	12		20	
Forward Transconductance ³	g _{FS}	V _{DS} = -10 V, I _D = -0.1 A	90	60		mS
Common Source Output Conductance ³	g _{OS}		400			μS
DYNAMIC						
Input Capacitance	C _{iss}	V _{DS} = -25 V V _{GS} = 0 V f = 1 MHz	15		60	pF
Output Capacitance	C _{oss}		10		25	
Reverse Transfer Capacitance	C _{rss}		3		5	
SWITCHING						
Turn-On Delay Time	t _{d(ON)}	V _{DD} = -25 V, R _L = 133 Ω I _D = -0.18 A, V _{GEN} = -10 V R _G = 25 Ω	6		10	ns
	t _r		10		15	
Turn-Off Delay Time	t _{d(OFF)}	(Switching time is essentially independent of operating temperature)	7		15	
	t _f		8		20	

- NOTES: 1. $T_A = 25^\circ\text{C}$ unless otherwise noted.
2. For design aid only, not subject to production testing.
3. Pulse test; $PW = 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.