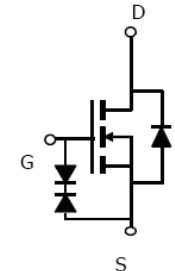
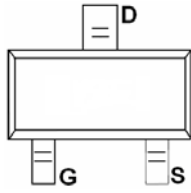
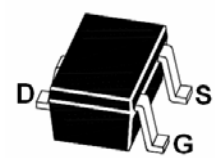


N-Channel Enhancement Mode Power MOSFET

<p>DESCRIPTION</p> <p>The PE1012E uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a Battery protection or in other Switching application.</p> <p>GENERAL FEATURES</p> <ul style="list-style-type: none"> ● $V_{DS} = 20V, I_D = 0.6A$ ● $R_{DS(ON)} < 700m\Omega @ V_{GS} = 4.5V$ ● $R_{DS(ON)} < 850m\Omega @ V_{GS} = 2.5V$ ● High Power and current handing capability ● Lead free product is acquired ● Gate-Source ESD Protection <p>Application</p> <ul style="list-style-type: none"> ● Battery operated Systems ● Load/ power Switching Cell Phones, Pagers ● Power Supply Converter Circuits 	<div style="text-align: center;">  <p>Schematic diagram</p> </div> <div style="text-align: center;">  <p>Marking and pin Assignment</p> </div> <div style="text-align: center;">  <p>SOT-523 top view</p> </div>
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Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current-Continuous	I_D	0.6	A
Drain Current-Pulsed (Note 1)	I_{DM}	1	A
Maximum Power Dissipation	P_D	150	mW
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	125	°C/W
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Electrical Characteristics (TA=25°C unless otherwise noted)

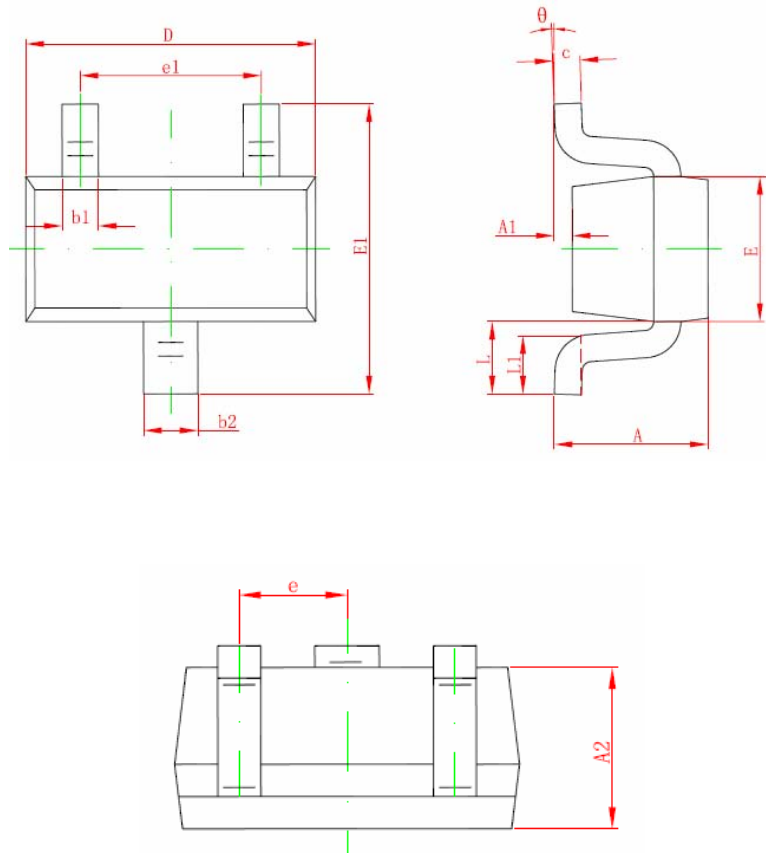
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	20	22	-	V

Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=16V, V_{GS}=0V$	-	0.3	100	nA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 4.5V, V_{DS}=0V$	-	-	± 1	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.75	1.2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=2.5V, I_D=0.5A$	-	530	850	m Ω
		$V_{GS}=4.5V, I_D=0.6A$	-	410	700	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=0.4A$	-	1	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{iss}	$V_{GS} = 0 V, f = 1.0 MHz,$ $V_{DS} = 16 V$	-	100	-	PF
Output Capacitance	C_{oss}		-	16	-	PF
Reverse Transfer Capacitance	C_{rss}		-	12	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V = 10 V, R = 47\Omega$ $I_D = 200 mA,$ $V_{GEN} = 4.5 V, R_G = 10\Omega$	-	5	-	nS
Turn-on Rise Time	t_r		-	5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	25	-	nS
Turn-Off Fall Time	t_f		-	11	-	nS
Total Gate Charge	Q_g	$V_{DS} = 10 V, V_{GS} = 4.5 V,$ $I_D = 250 mA$	-	750	-	pC
Gate-Source Charge	Q_{gs}		-	75	-	pC
Gate-Drain Charge	Q_{gd}		-	225	-	pC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=0.6A$	-	0.75	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	0.6	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

SOT-523 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

NOTES

1. All dimensions are in millimeters.
2. Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.