

P-Channel 100V MOSFET

E100P045CL1

V_{DS} (V)	$R_{DS(on),max}$ (m Ω)	I_D (A)
-100	45@ $V_{GS} = -10V$	-40 ⁽¹⁾

Features

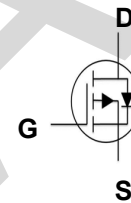
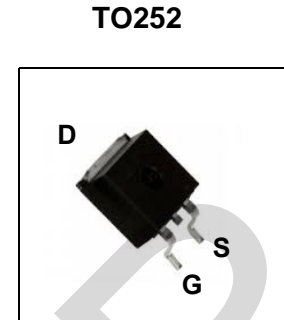
- Trench DMOS technology
- Low thermal impedance
- 100% avalanche tested

Applications

- Fast switching

Package and ordering information

Ordering code	Package	Device code
E100P045CL1	TO252	---



Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Maximum	Units	
Drain-Source Voltage	V_{DS}	-100	V	
Gate-Source Voltage	V_{GS}	± 20	V	
Drain Current-Continuous	TC=25 $^\circ\text{C}$	I_D	-40	A
	TC=100 $^\circ\text{C}$	I_D	-19	A
Drain Current – Pulsed	I_{DM}	-120	A	
Maximum Power Dissipation	P_D	102	W	
Single pulse avalanche energy ⁽¹⁾	E_{AS}	230	mJ	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ\text{C}$	

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance junction-case	$R_{\theta Jc}$		1.22	$^\circ\text{C}/\text{W}$
Thermal Resistance junction-to-Ambient	$R_{\theta JA}$		62	$^\circ\text{C}/\text{W}$

Electrical Characteristics(T_J=25 °C unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-100			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-100V, V_{GS}=0V$			1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	-1.6	-2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=-10V, I_D=-15A$		38	45	m Ω
		$V_{GS}=-4.5V, I_D=-10A$		42	55	m Ω
gfs	Forward Transconductance	$V_{DS}=-10V, I_D=-5A$		22		S
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{DS}=-25V, V_{GS}=0V,$ $F=1.0MHz$		2300		pF
C_{oss}	Output Capacitance			220		pF
C_{rSS}	Reverse Transfer Capacitance			50		pF
SWITCHING PARAMETERS						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=-50V, I_D=-5A,$ $V_{GS}=-10V,$ $R_G=25\Omega$		58		nS
t_r	Turn-on Rise Time			24		nS
$t_{d(off)}$	Turn-Off Delay Time			215		nS
t_f	Turn-Off Fall Time			94		nS
Q_g	Total Gate Charge	$V_{DS}=-50V, I_D=-10A,$ $V_{GS}=-10V$		98		nC
Q_{gs}	Gate-Source Charge			16		nC
Q_{gd}	Gate-Drain Charge			13.5		nC
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=-1A$		-0.7	-1.2	V

Note:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=-50V, V_{GS}=-10V, L=0.1mH, I_{AS}=60A.,$ Starting $T_J=25^\circ C$
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

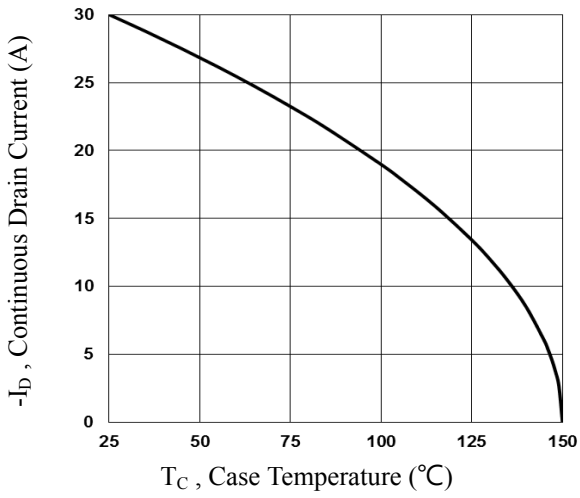


Fig.1 Continuous Drain Current vs. T_c

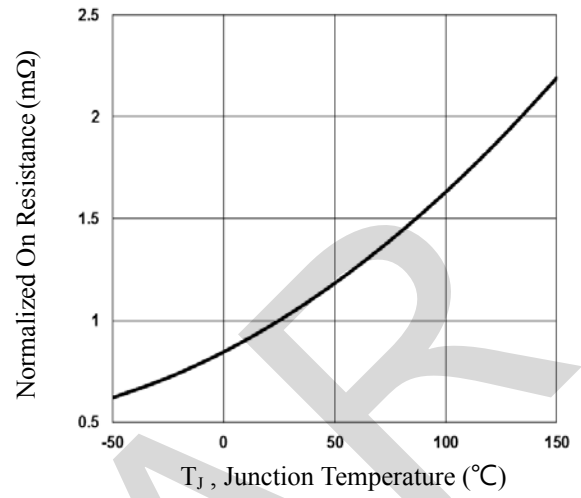


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

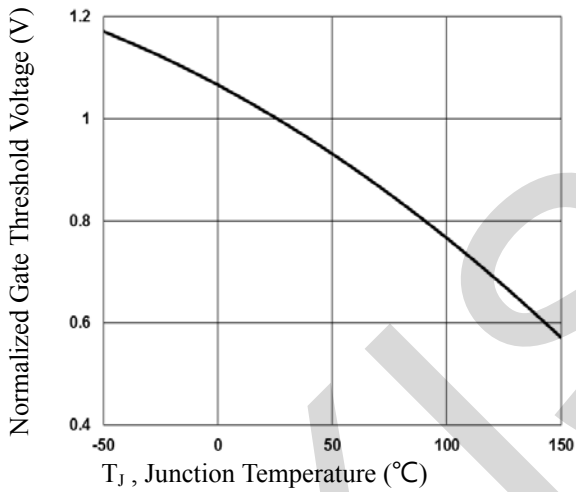


Fig.3 Normalized V_{th} vs. T_j

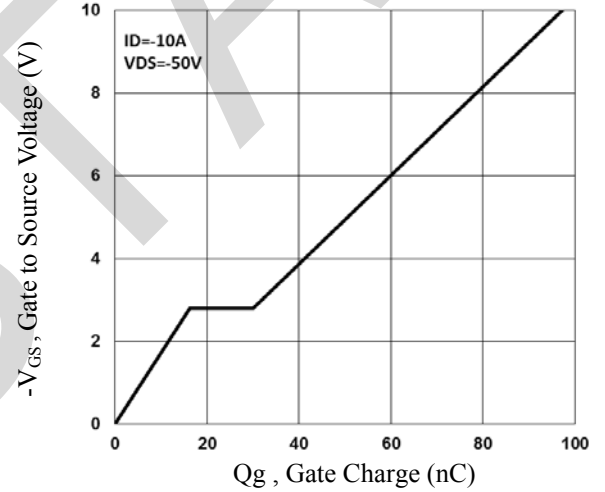


Fig.4 Gate Charge Waveform

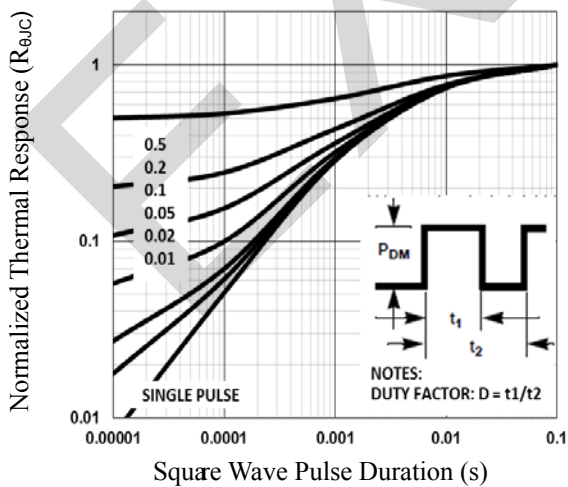


Fig.5 Normalized Transient Impedance

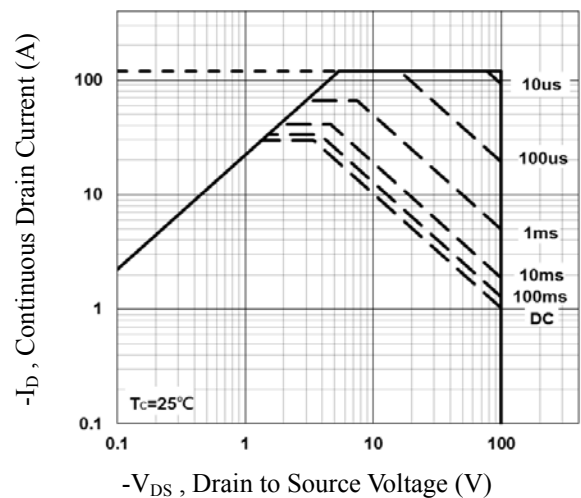


Fig.6 Maximum Safe Operation Area

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

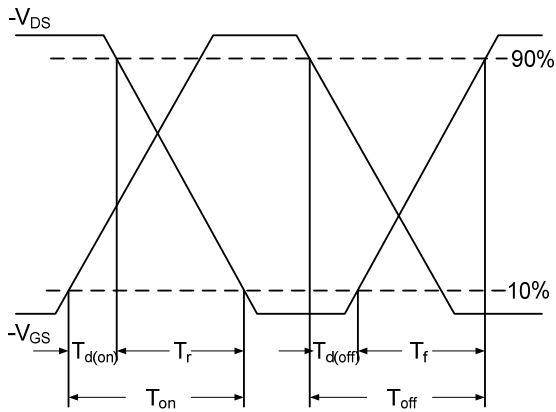


Fig.7 Switching Time Waveform

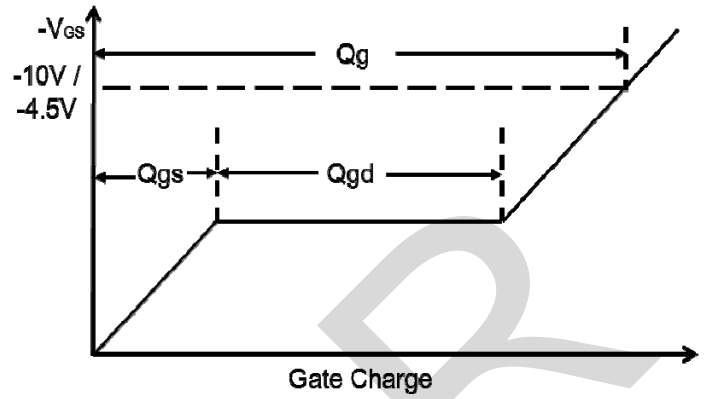
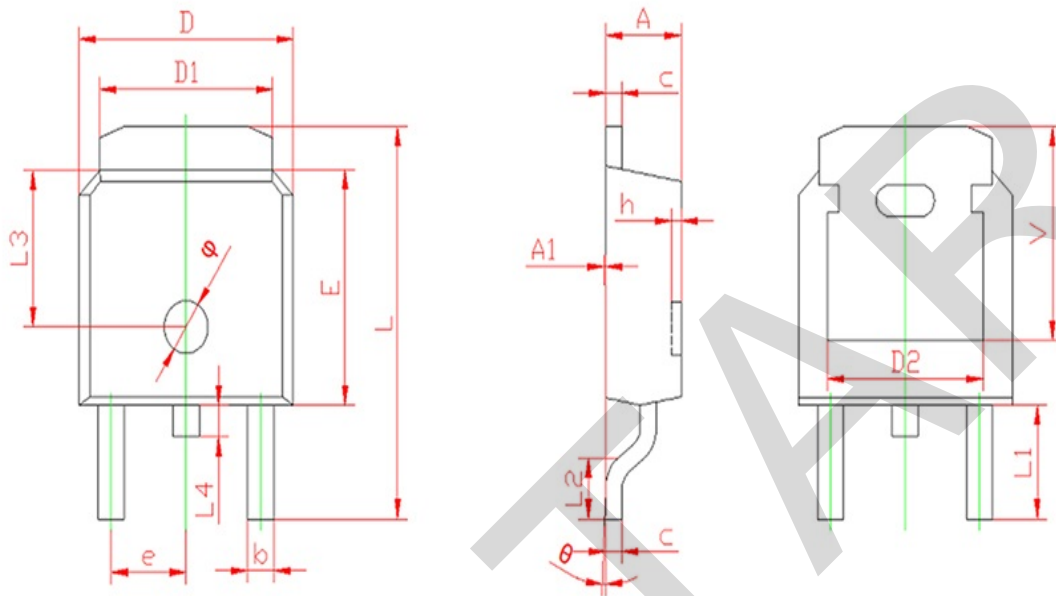


Fig.8 Gate Charge Waveform

EXISTAR

5. Package outline dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.800 REF		0.189 REF	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF		0.114 REF	
L2	1.400	1.700	0.055	0.067
L3	4.00 REF		0.157 REF	
L4	0.600	1.000	0.024	0.039
φ	1.200	1.400	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.500 REF		0.217 REF	

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