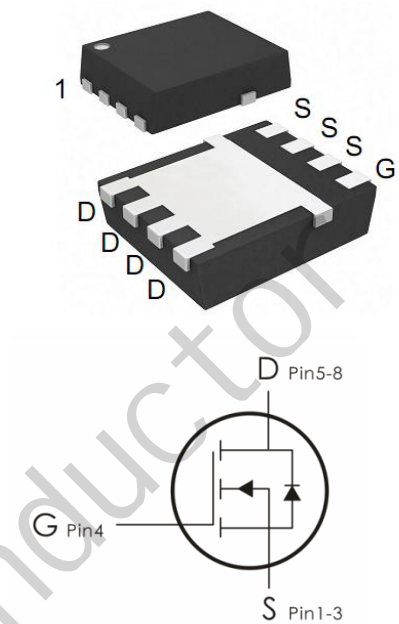


Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=40V, I_D=90A, R_{DS(on)} < 5.5m\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C$	90	A
	Continuous Drain Current- $T_C=100^\circ C$	57	
	Pulsed Drain Current	360	
E_{AS}	Single Pulse Avalanche Energy	59	mJ
P_D	Power Dissipation	83	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ²	1.5	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to mbient	62	$^\circ C/W$

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units	
Off Characteristics							
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	40	---	---	V	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=40V$	---	---	1	μA	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA	
On Characteristics³							
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1.2	1.6	2.5	V	
$R_{DS(on)}$	Drain-Source On Resistance ²	$V_{GS}=10V, I_D=20A$	---	4.2	5.5	m Ω	
		$V_{GS}=4.5V, I_D=10A$	---	5.3	7		
G_{FS}	Forward Transconductance	$V_{DS}=10V, I_D=2A$	---	16.5	---	S	
Dynamic Characteristics⁴							
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	---	2400	3580	pF	
C_{oss}	Output Capacitance		---	220	380		
C_{rss}	Reverse Transfer Capacitance		---	150	220		
Switching Characteristics⁴							
$t_{d(on)}$	Turn-On Delay Time 3, 4	$V_{DD}=15V, I_D=1A, R_G=3.3\Omega$	---	14.2	28	ns	
t_r	Rise Time 3, 4		---	18.3	36	ns	
$t_{d(off)}$	Turn-Off Delay Time 3, 4		$V_{GS}=10V$	---	38.8	76	ns
t_f	Fall Time 3, 4		---	13.9	28	ns	
Q_g	Total Gate Charge 3, 4		---	25	50	nC	
Q_{gs}	Gate-Source Charge 3, 4 3, 4	$V_{GS}=4.5V, V_{DS}=32V,$	---	6.4	13	nC	
Q_{gd}	Gate-Drain "Miller" Charge 3, 4	$I_D=10A$	---	12.1	24	nC	

Drain-Source Diode Characteristics						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V_{SD}	Source-Drain Diode Forward Voltage ³	$V_{GS}=0V, I_S=1A$	---	---	1	V
LS	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	90	A
LSM	Pulsed Source Current		---	---	180	A

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Characteristics: ($T_C=25^\circ C$ unless otherwise noted)

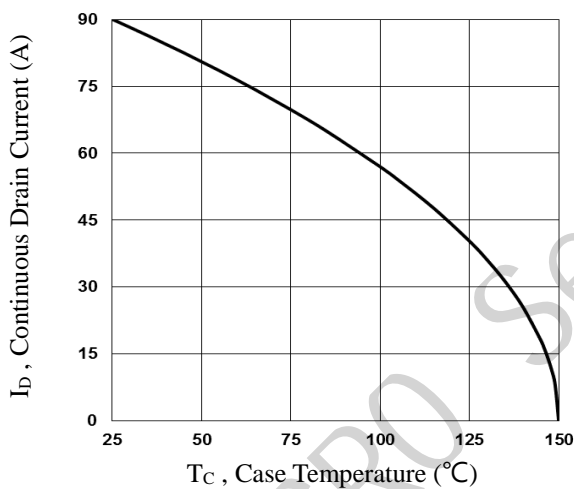


Fig.1 Continuous Drain Current vs. T_C

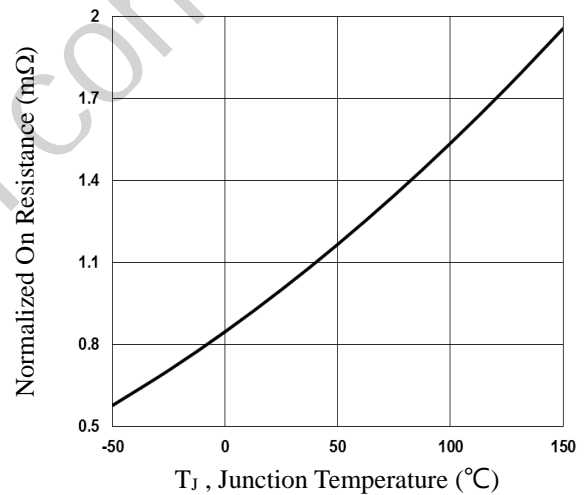


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

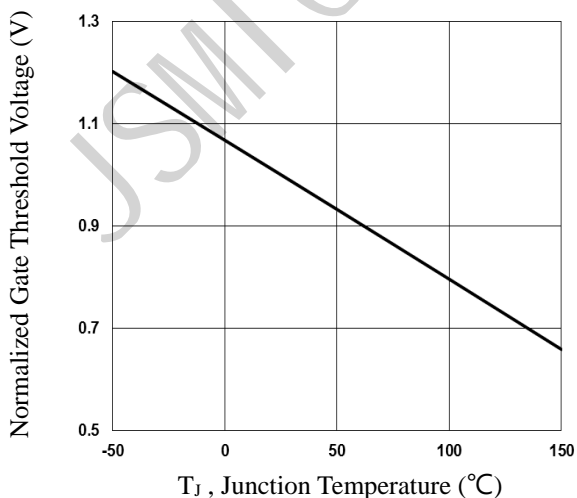


Fig.3 Normalized V_{th} vs. T_J

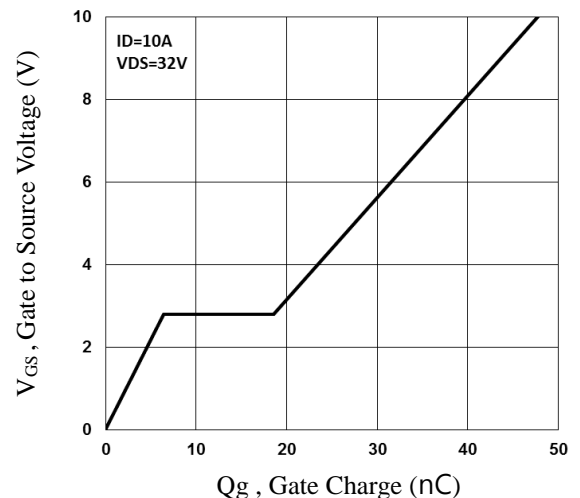


Fig.4 Gate Charge Waveform

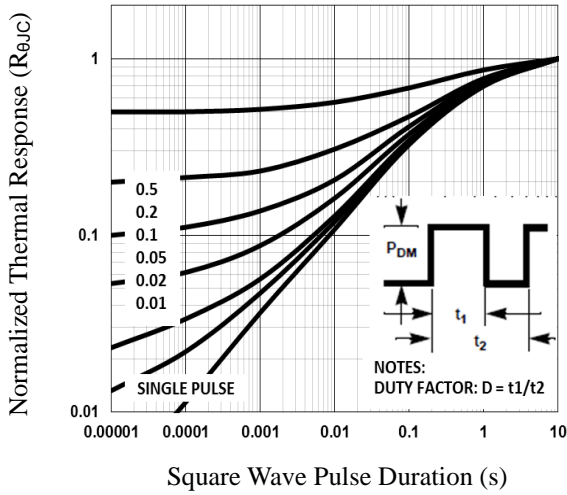


Fig.5 Normalized Transient Impedance

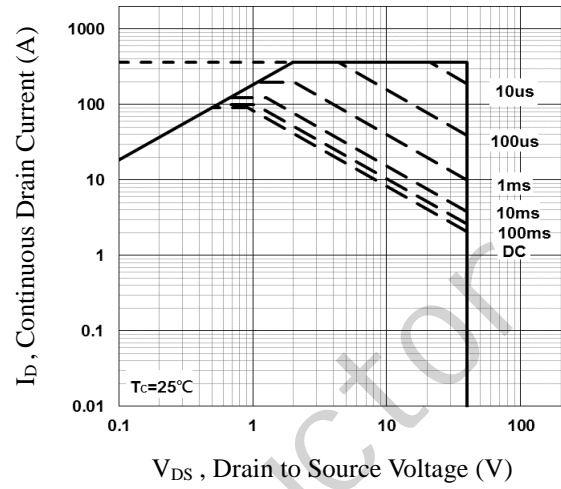


Fig.6 Maximum Safe Operation Area

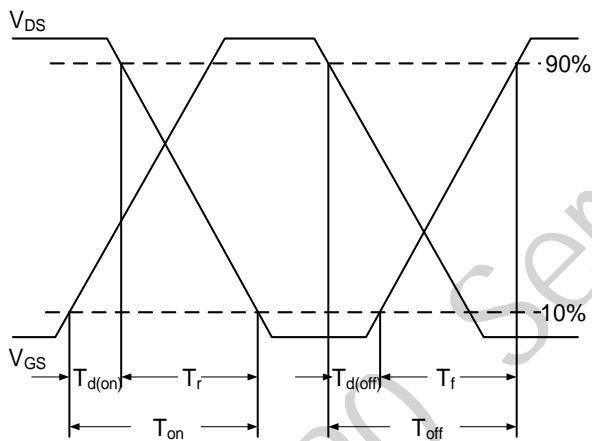


Fig.7 Switching Time Waveform

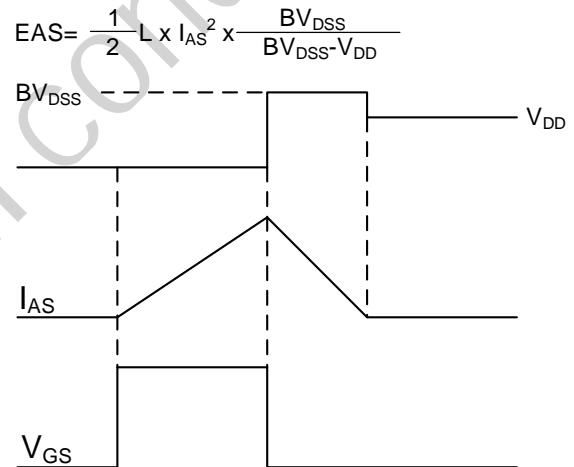
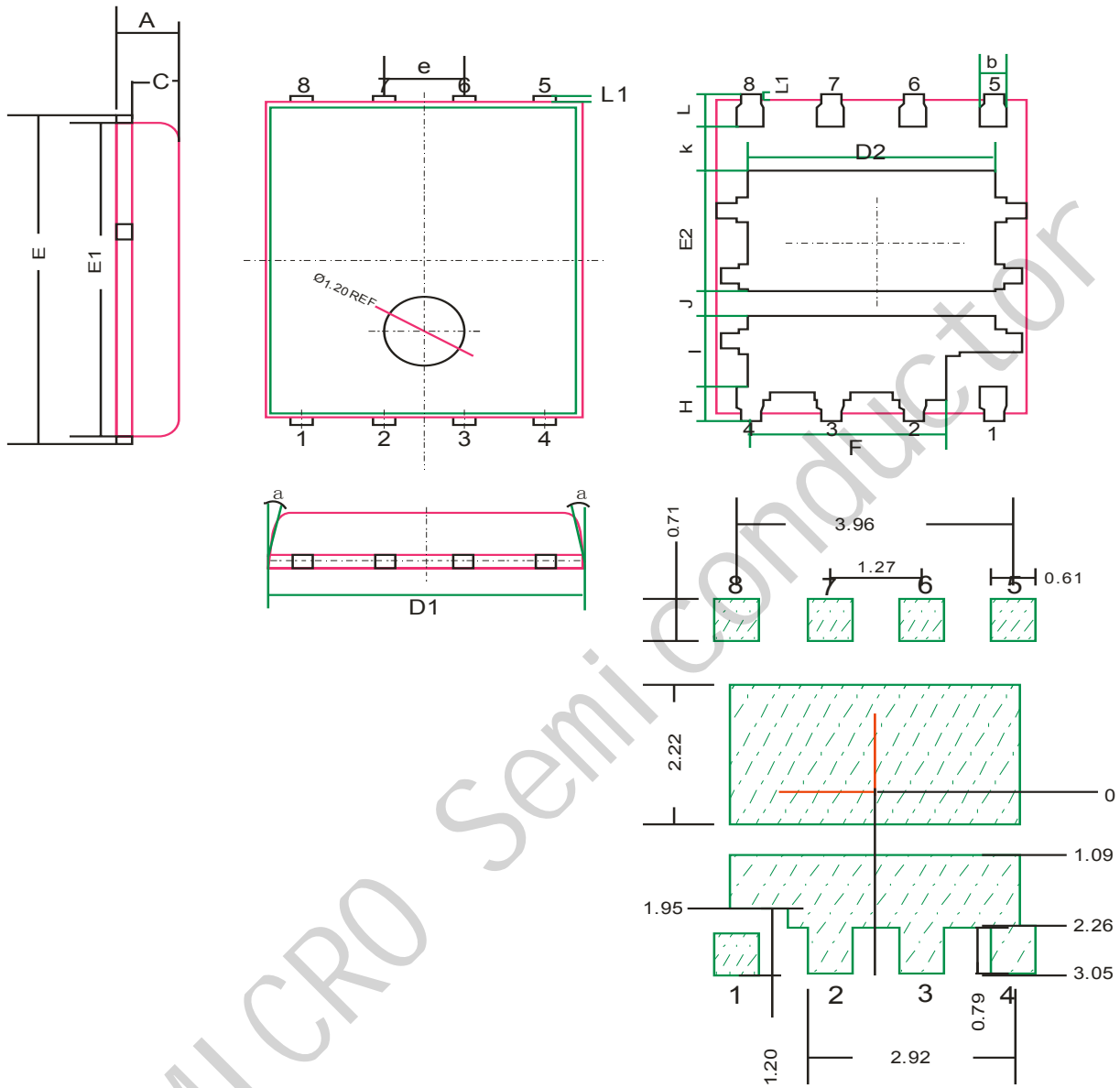


Fig.8 EAS Waveform

Package Information



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043	E1	5.70	5.75	5.80	0.224	0.226	0.228
b	0.33	0.41	0.51	0.013	0.016	0.020	E2	2.02	2.17	2.32	0.079	0.085	0.091
c	0.20	0.25	0.30	0.008	0.010	0.012	e	1.27BSC			0.05BSC		
D1	4.80	4.90	5.00	0.189	0.193	0.197	H	0.48	0.58	0.68	0.018	0.022	0.026
D2	3.61	3.81	3.96	0.142	0.150	0.156	L	0.51	0.61	0.71	0.020	0.024	0.028
L1	0.06	0.13	0.20	0.002	0.005	0.008							
E	5.90	6.00	6.10	0.232	0.236	0.240	@	0°	*	12°	*	10°	12°
K	0.50	*	*	0.019	*	*	J	0.40	0.50	0.60	0.015	0.019	0.023
I	1.22	1.32	1.42	0.048	0.051	0.055	F	2.87	3.07	3.22	0.112	0.12	0.126