

SE10070G

N-Channel Enhancement-Mode MOSFET

Revision: A

General Description

Advanced trench technology to provide excellent RDS(ON), low gate charge and low operation voltage. This device is suitable for using as a load switch or in PWM applications.

- Simple Drive Requirement
- Small Package Outline
- Surface Mount Device

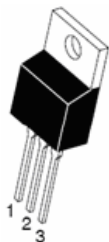
Features

For a single MOSFET

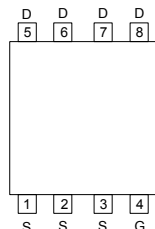
- $V_{DS} = 100V$
- $R_{DS(ON)} = 12m\Omega @ V_{GS}=10V$

Pin configurations

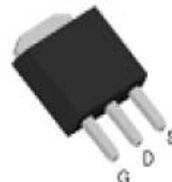
See Diagram below



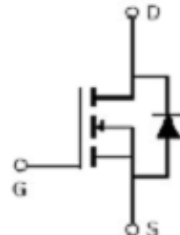
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DFN5*6



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Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	I_D	Continuous ^{1,2,3}	70
		Pulsed	280
Total Power Dissipation	P_D	170	W
Single-pulse avalanche energy ⁴	E_{AS}	580	mJ
Operating Junction Temperature Range	T_J	-55 to 150	$^{\circ}C$

Thermal Resistance

Symbol	Parameter	Min	Typ	Units
$R_{\theta JA}$	Junction to Ambient		0.88	$^{\circ}C/W$

Electrical Characteristics (T _J =25°C unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS (Note 2)						
B _V DSS	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0 V	100			V
I _{DSS}	Drain to Source Leakage Current	V _{DS} = 100V, V _{GS} =0V			1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =20 V			100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250μA	2	3	4	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =39A		12	16	mΩ
g _{FS}	Forward Transconductance	V _{DS} = 25V, I _D =28A	32			S
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, f=1MHz		4400		pF
C _{oss}	Output Capacitance			320		pF
C _{rss}	Reverse Transfer Capacitance			240		pF
SWITCHING PARAMETERS						
Q _g	Total Gate Charge ²	V _{DD} =80V, V _{GS} =10V, I _D =39A		95		nC
Q _{gs}	Gate Source Charge			18		nC
Q _{gd}	Gate Drain Charge			25		nC
t _{d(on)}	Turn-On Delay Time	V _{DD} =50V, V _{GS} =10V, I _D =39A, R _{GEN} =2.5Ω		12		ns
t _{d(off)}	Turn-Off Delay Time			45		ns
t _{d(r)}	Turn-On Rise Time			55		ns
t _{d(f)}	Turn-Off Fall Time			47		ns
Source-Drain Characteristics						
Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V _{SD}	Diode forward voltage	V _{GS} =0V, I _S =100A		0.85	1.2	V
I _S	Diode forward current				57	A
T _{rr}	Reverse recovery time ⁷	T _J =25°C, I _F =28A di/dt=100A/μs		36		ns
Q _{rr}	Reverse recovery charge ⁷			56		nC

Typical Characteristics

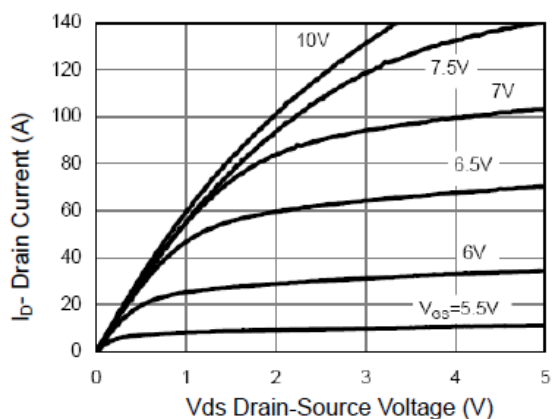


Figure 1 Output Characteristics

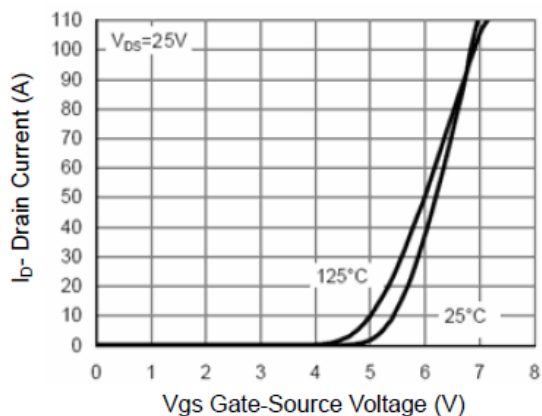


Figure 2 Transfer Characteristics

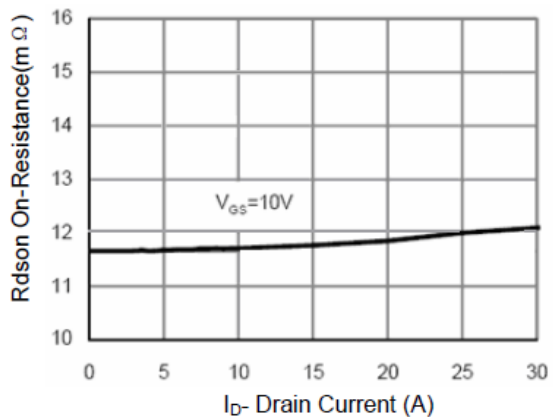


Figure 3 $R_{DS(on)}$ - Drain Current

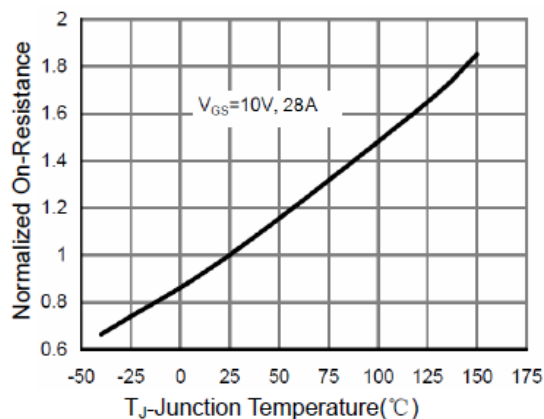


Figure 4 $R_{DS(on)}$ -Junction Temperature

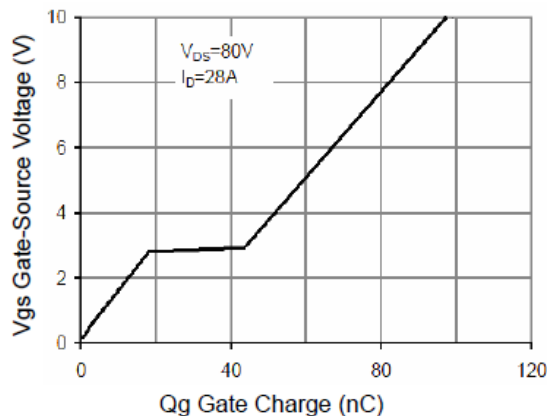


Figure 5 Gate Charge

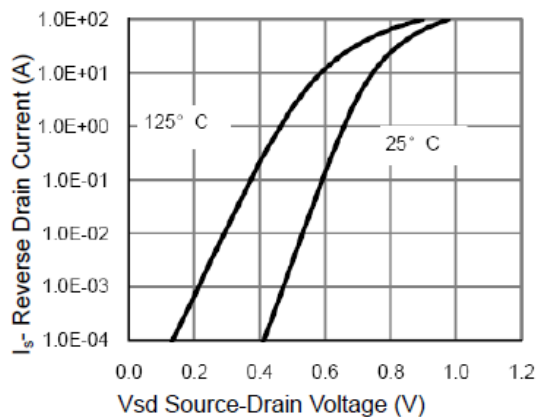


Figure 6 Source- Drain Diode Forward

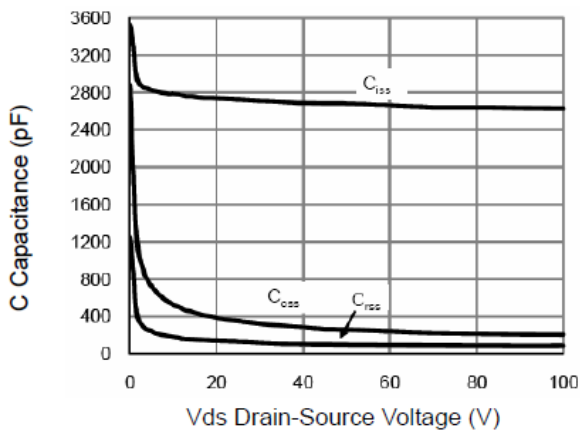


Figure 7 Capacitance vs Vds

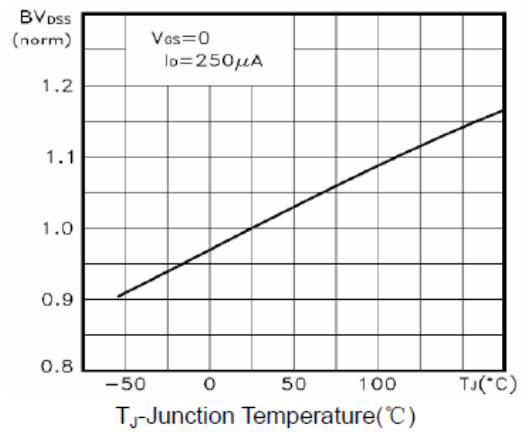


Figure 9 BV_{DSS} vs Junction Temperature

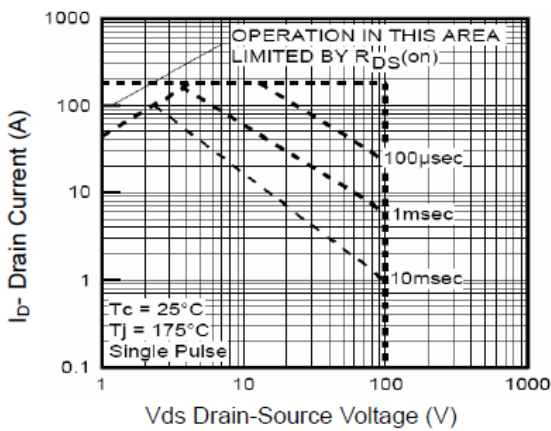


Figure 8 Safe Operation Area

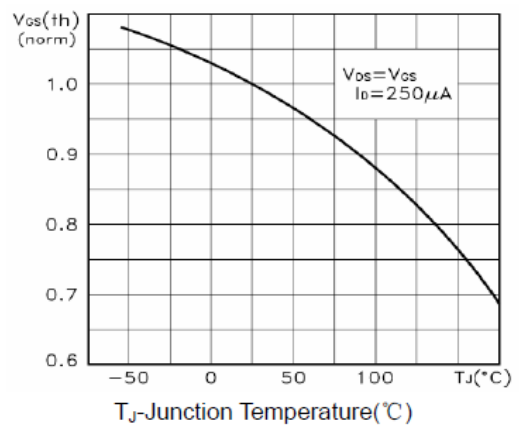


Figure 10 $V_{GS(th)}$ vs Junction Temperature

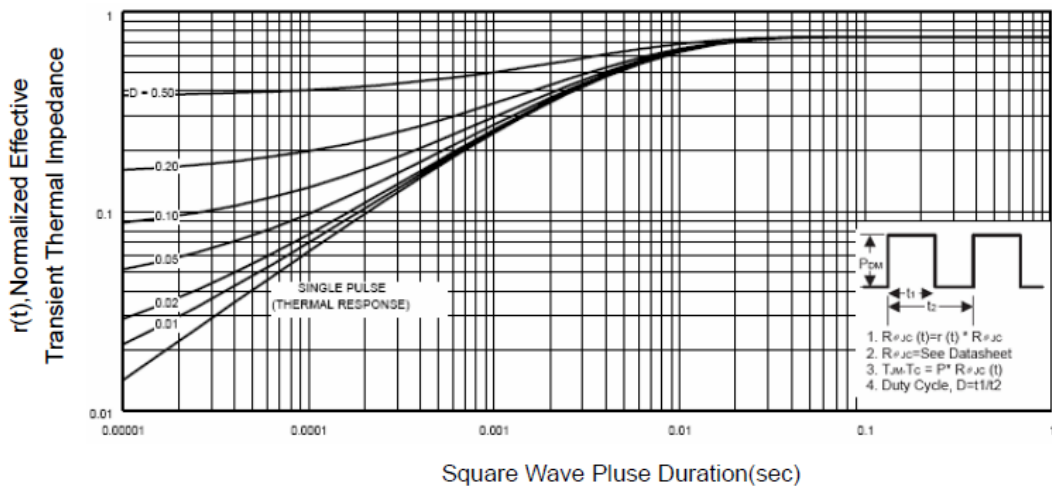
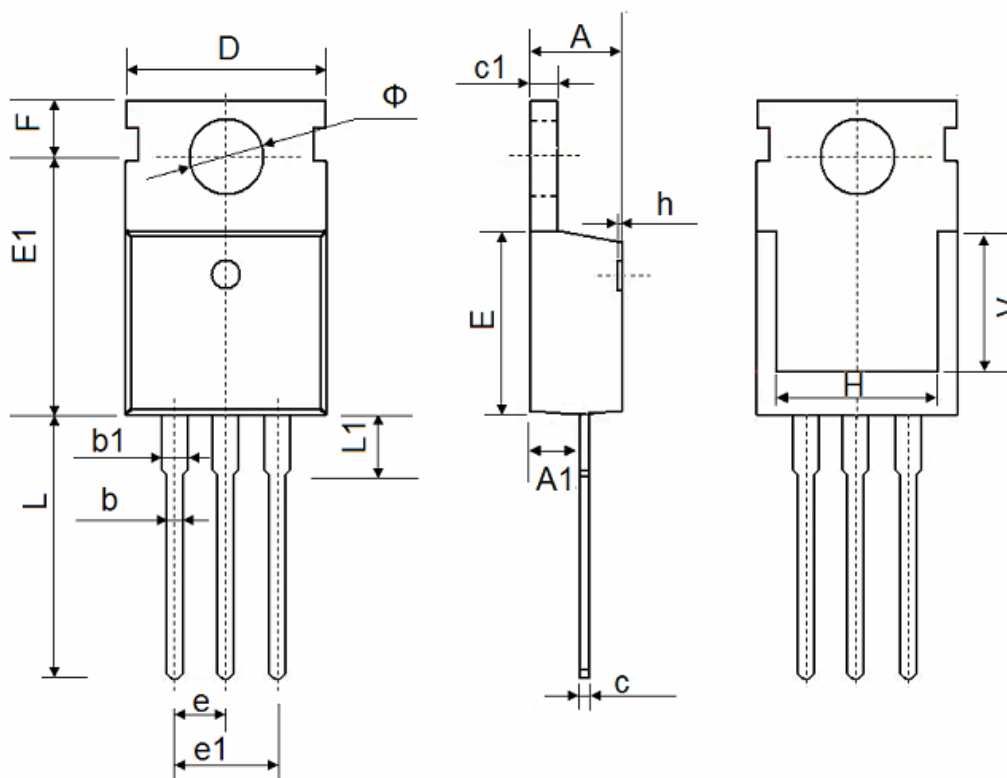


Figure 11 Normalized Maximum Transient Thermal Impedance

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Package Outline Dimension

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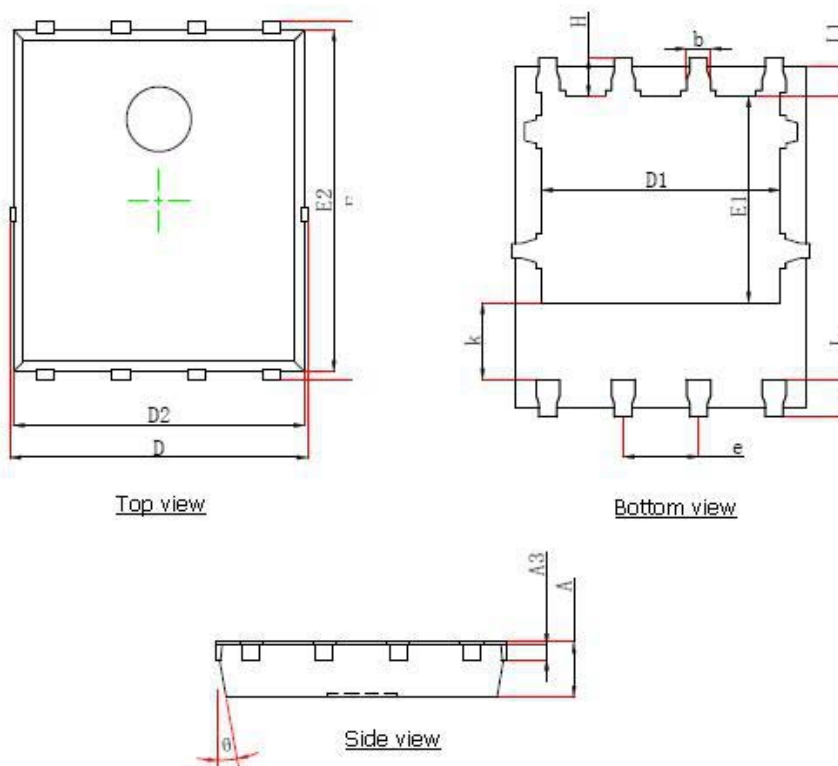


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295 REF.	
φ	3.400	3.800	0.134	0.150

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Package Outline Dimension

DFN5 × 6

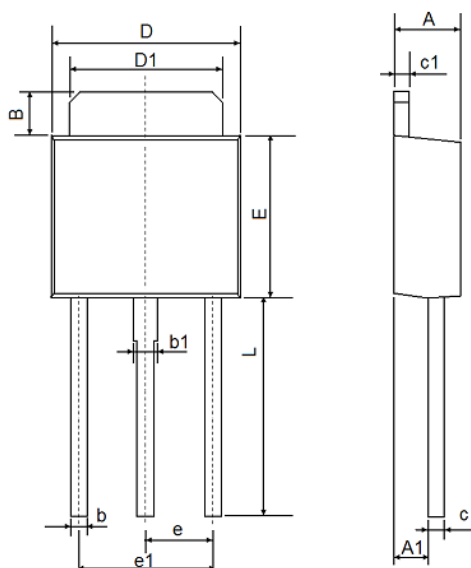


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

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Package Outline Dimension

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Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	1.050	1.350	0.042	0.054
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	7.500	7.900	0.295	0.311

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