N-Channel 40V(D-S) MOSFET

Product summary		
V_{DS}	40	V
$R_{DS(ON)}$(at V_{GS}=10V) Typ.	6.4	mΩ
$R_{DS(ON)}$(at V_{GS}=4.5V) Typ.	9.4	mΩ
I_D(Tc=25℃)	19	A

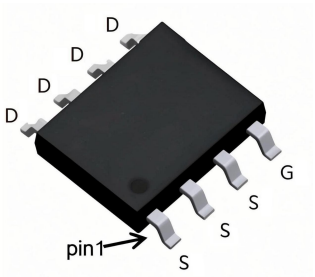
Features

- High density cell design for low $R_{DS(ON)}$
- Single Drive Requirement
- Fast Switching Characteristic

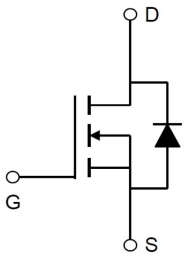
Applications

- Power management functions

Pin Configuration



SOP8



Packing Information

Device	Marking	Reel Size	Tape Width	Quantity
ECHA19N04S	D07N04	13″	12mm	2500pcs

Absolute Maximum Ratings (at TA=25℃ Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		40	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current at V_{GS}=10V	T_C=25℃	19	A
		T_C=100℃	13	A
I_{DM}	Pulse Drain Current Tested [A]		64	A
E_{AS}	Single Pulse Avalanche Energy		256	mJ
P_D	Power Dissipation		3.1	W
T_J,T_{STG}	Junciton and Storage Temperature Range		-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient [B]	40	℃/W

Electrical Characteristics (at T_J =25℃ Unless Otherwise Noted)

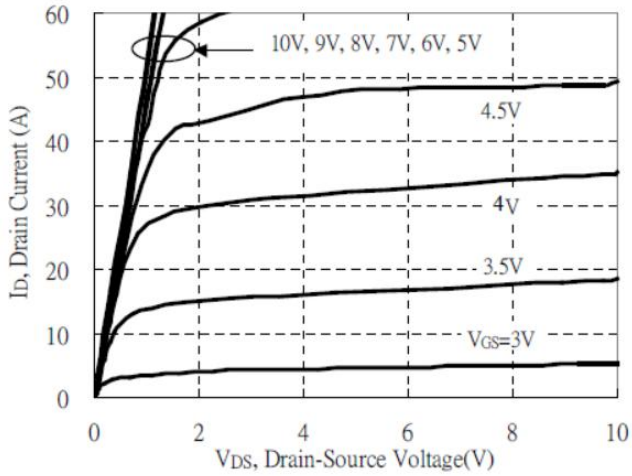
Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=32V,V_{GS}=0V	--	--	1	uA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±20V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.5	--	3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V,I_D=11A	--	6.4	8	mΩ
		V_{GS}=4.5V,I_D=8A	--	9.4	12	mΩ
V_{SD}	Forward Voltage	I_S=11A,V_{GS}=0V	--	--	1.2	V
I_{SM}	Maximum Body-Diode Continuous Current		--	--	19	A
Dynamic Parameters						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=25V f=1MHZ	--	1421	--	pF
C_{oss}	Output Capacitance		--	172	--	pF
C_{rss}	Reverse Transfer Capacitance		--	126	--	pF
Switching Parameters						
Q_g	Total Gate Charge	V_{DS}=32V,I_D=16A V_{GS}=10V	--	32.3	--	nC
Q_{gs}	Gate-Source Charge		--	5.5	--	nC
Q_{gd}	Gate-Drain Charge		--	9.9	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DD}=20V I_D=1A,R_G=1Ω, V_{GS}=10V	--	14.6	--	nS
t_r	Turn-on Rise Time		--	18.8	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	43.4	--	nS
t_f	Turn-off Fall Time		--	8	--	nS

A. Pulse width limited by maximum junction temperature

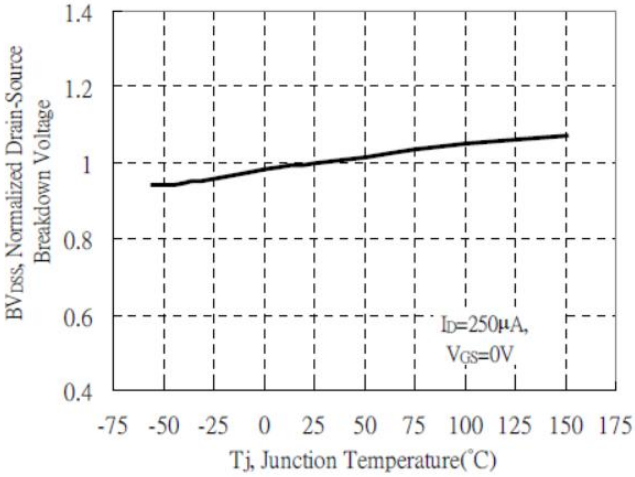
B. 40℃ / W when mounted on a 1 in2 pad of 2 oz copper, t≤10s; 125℃/W when mounted on minimum pad.

Typical Characteristics

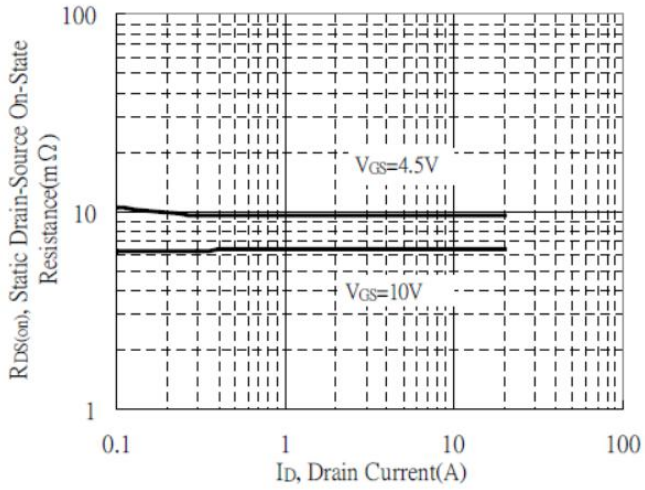
Typical Output Characteristics



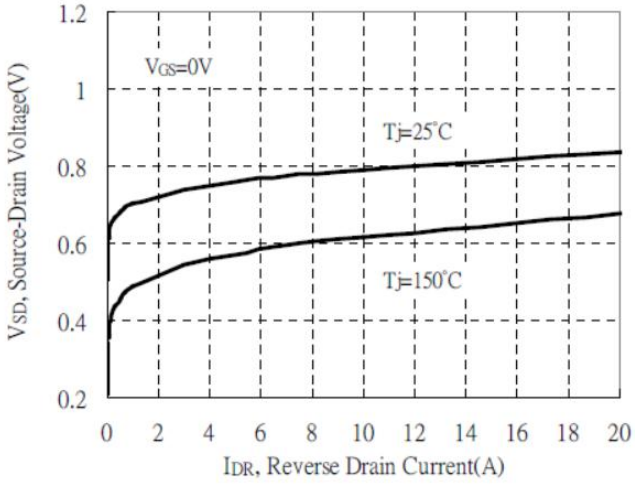
Brekdown Voltage vs Ambient Temperature



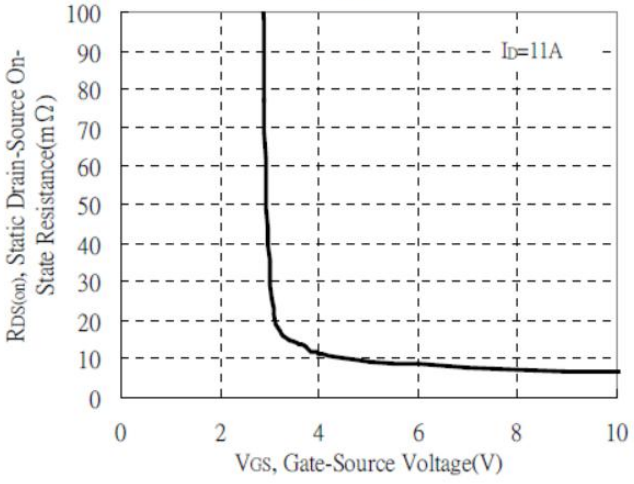
Static Drain-Source On-State resistance vs Drain Current



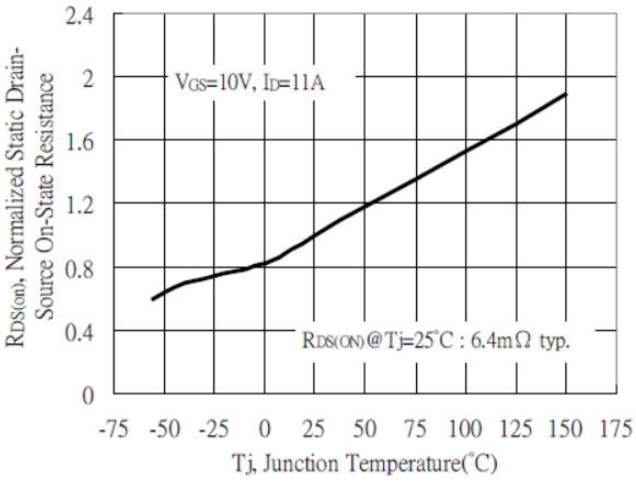
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

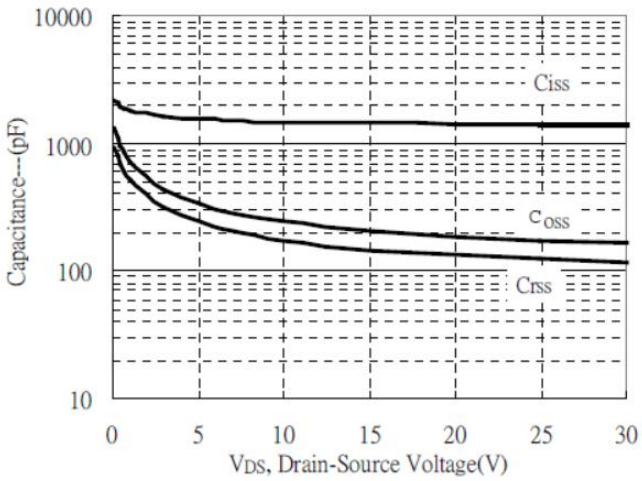


Drain-Source On-State Resistance vs Junction Tempearture

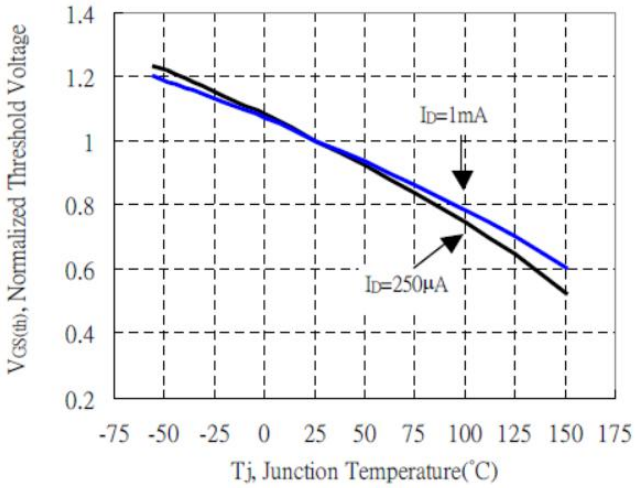


Typical Characteristics

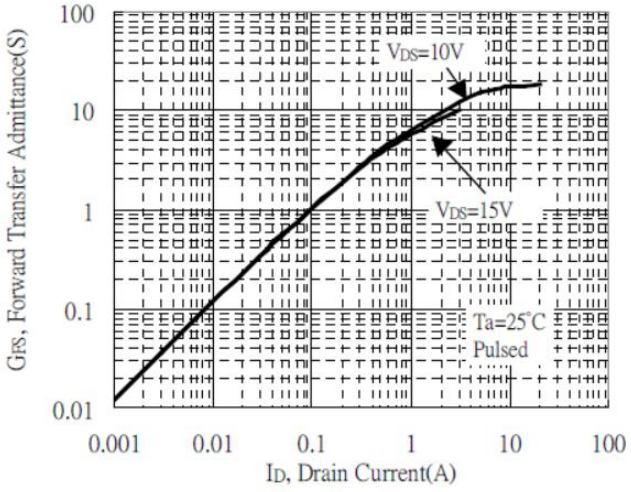
Capacitance vs Drain-to-Source Voltage



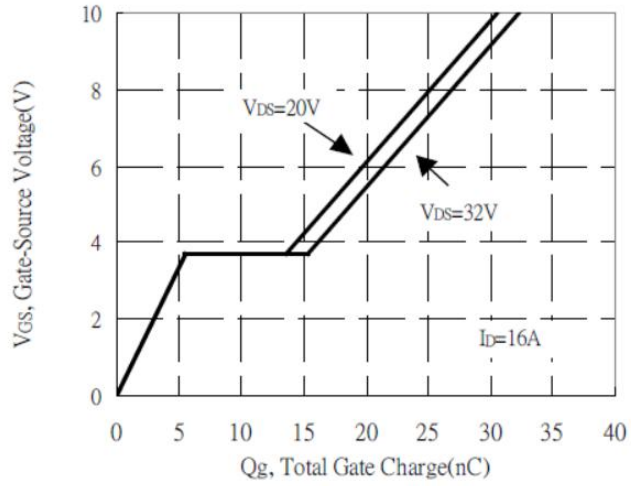
Threshold Voltage vs Junction Tempearture



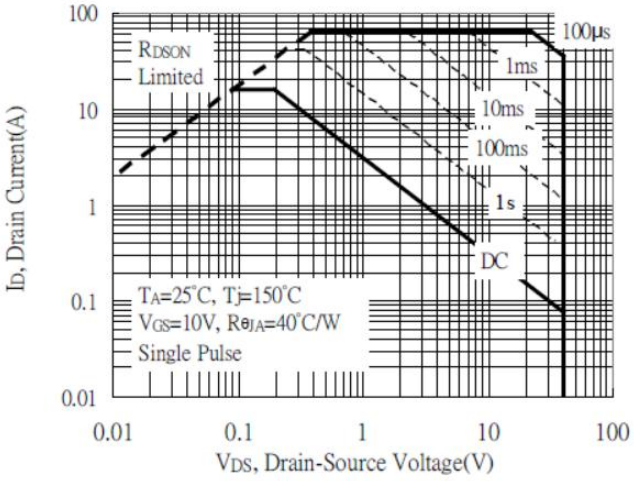
Forward Transfer Admittance vs Drain Current



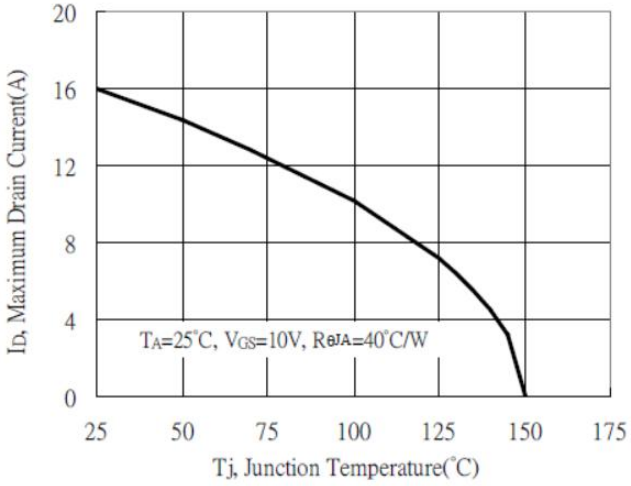
Gate Charge Characteristics



Maximum Safe Operating Area

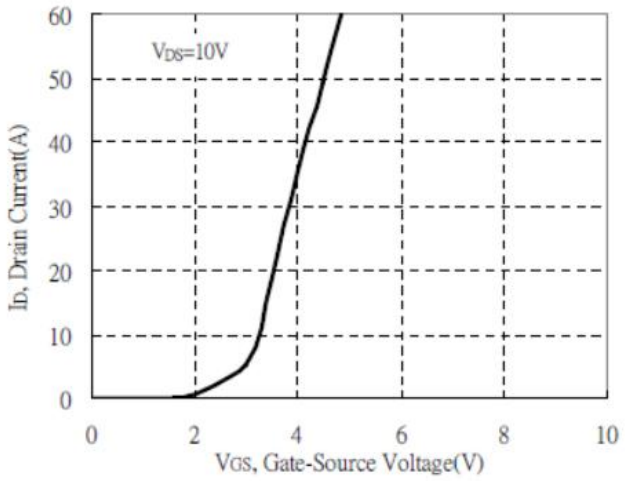


Maximum Drain Current vs Junction Temperature

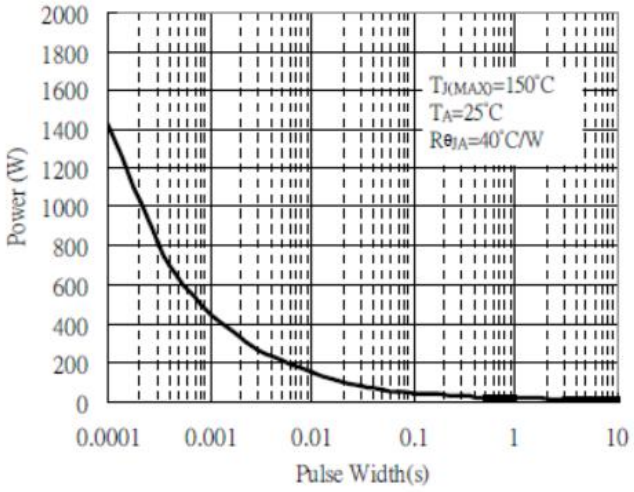


Typical Characteristics

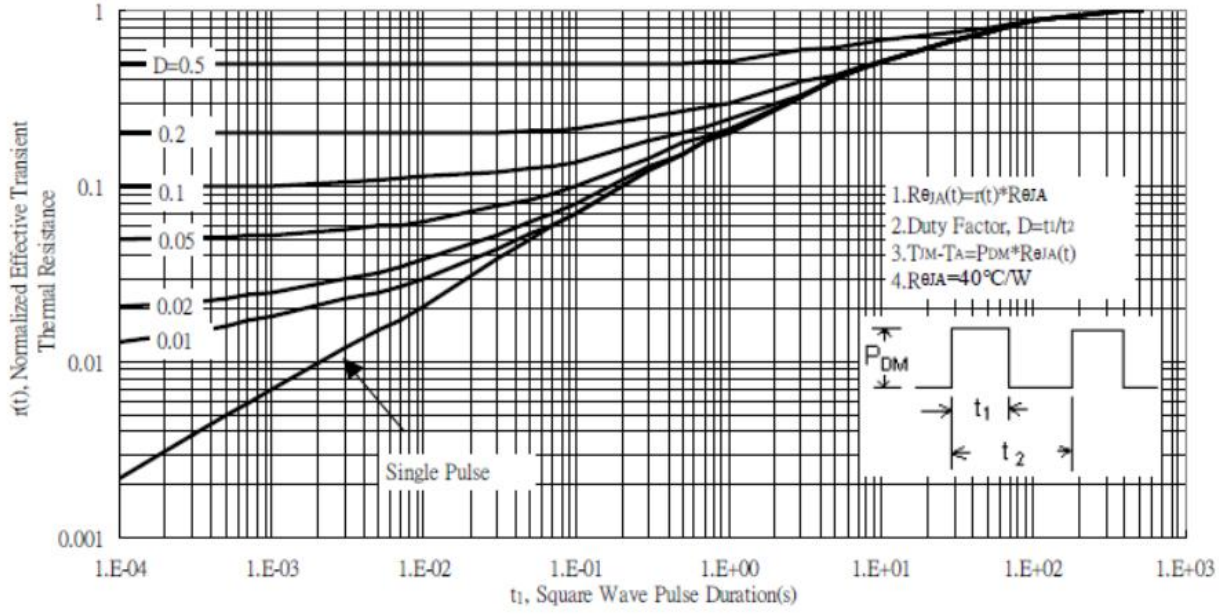
Typical Transfer Characteristics



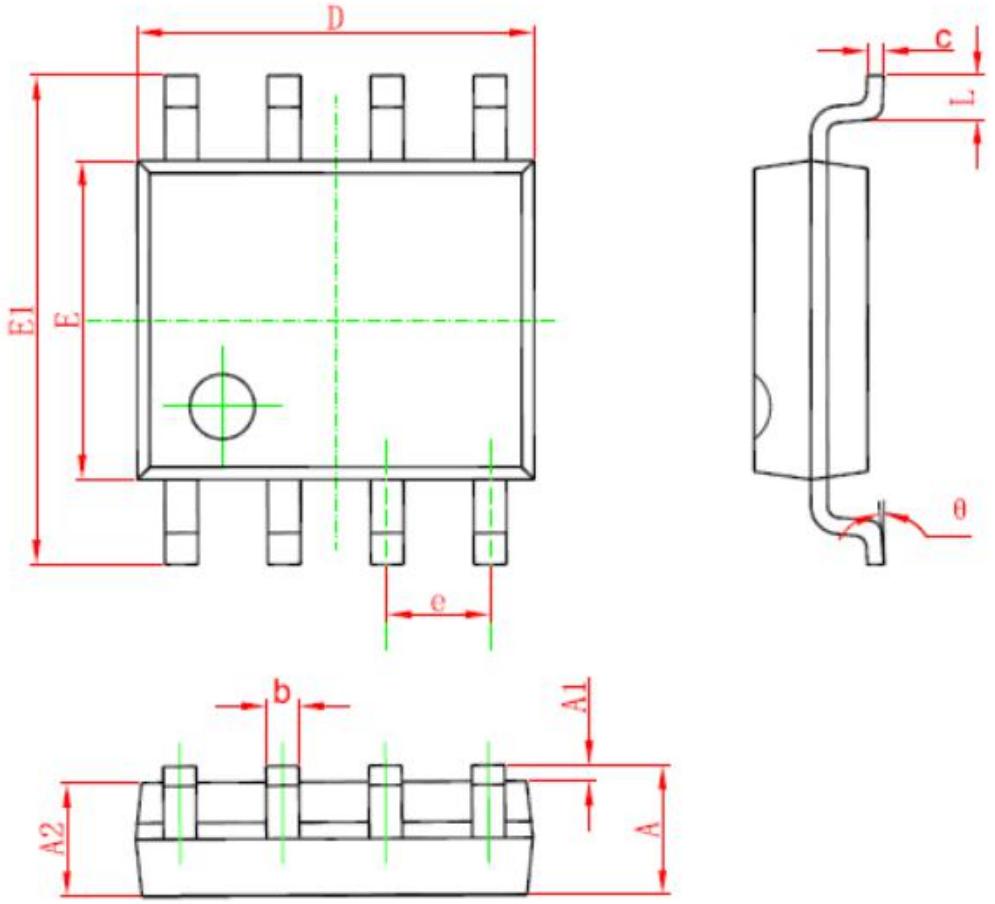
Single Pulse Power Rating, Junction to Case



Transient Thermal Response Curves



SOP8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°