

Features

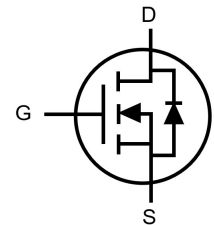
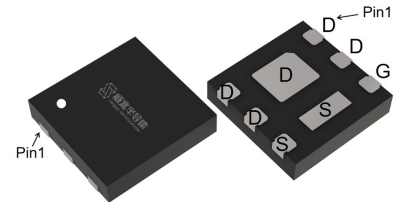
- Enhancement mode
- Fast Switching and High efficiency
- Pb-free lead plating; RoHS compliant

V_{DS}	30	V
$R_{DS(on),TYP@ V_{GS}=10V}$	14	mΩ
$R_{DS(on),TYP@ V_{GS}=4.5V}$	20	mΩ
I_D	10	A

DFN2x2x0.75-6L



Part ID	Package Type	Marking	Packing
VS3640AA	DFN2x2x0.75-6L	3640	3000PCS/Reel



Maximum ratings, at $T_A=25^{\circ}\text{C}$, unless otherwise specified

Symbol	Parameter		Rating	Unit
V _{(BR)DSS}	Drain-Source breakdown voltage		30	V
V _{GS}	Gate-Source voltage		±20	V
I _s	Diode continuous forward current	T _A =25°C	2.1	A
I _D	Continuous drain current @V _{GS} =10V	T _A =25°C	10	A
		T _A =70°C	8	A
I _{DM}	Pulse drain current tested ①	T _A =25°C	40	A
P _D	Maximum power dissipation	T _A =25°C	2.5	W
		T _A =70°C	1.6	W
T _{STG} , T _J	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	7	$^{\circ}\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	50	$^{\circ}\text{C/W}$

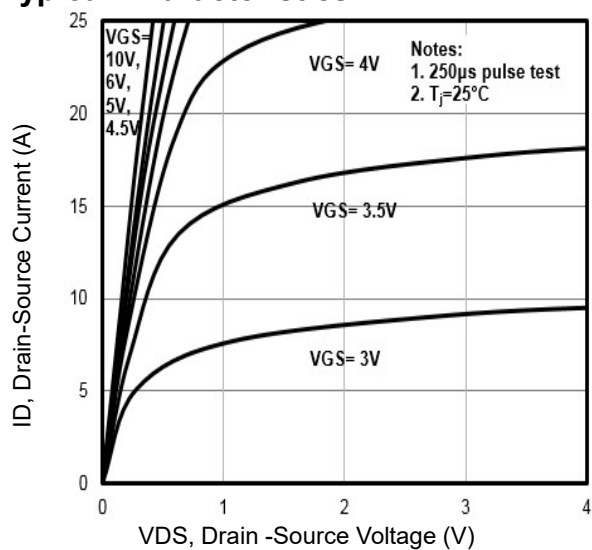
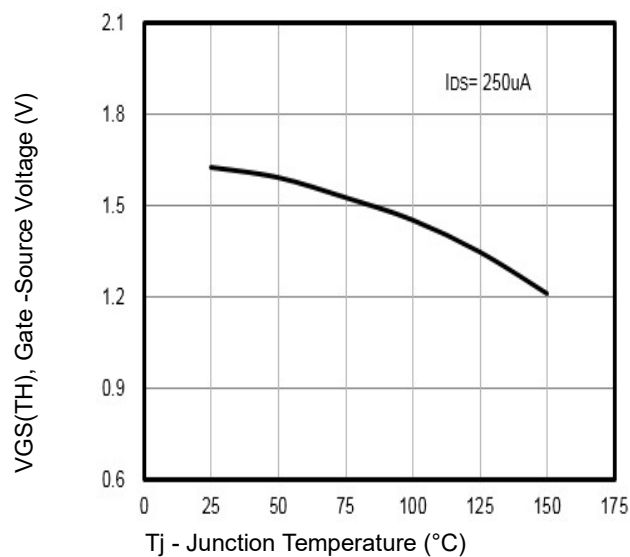
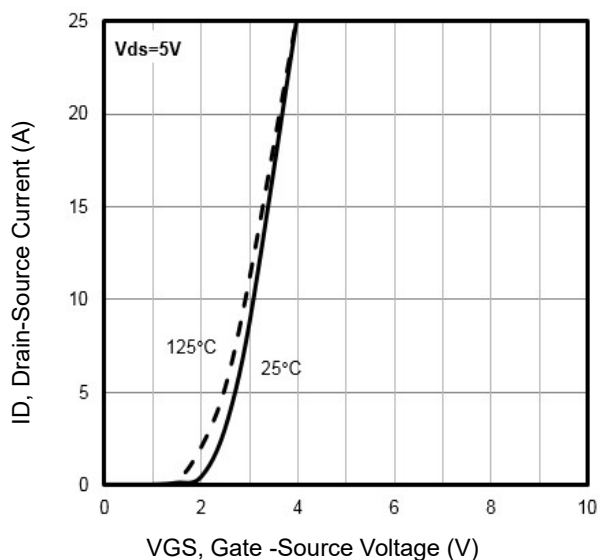
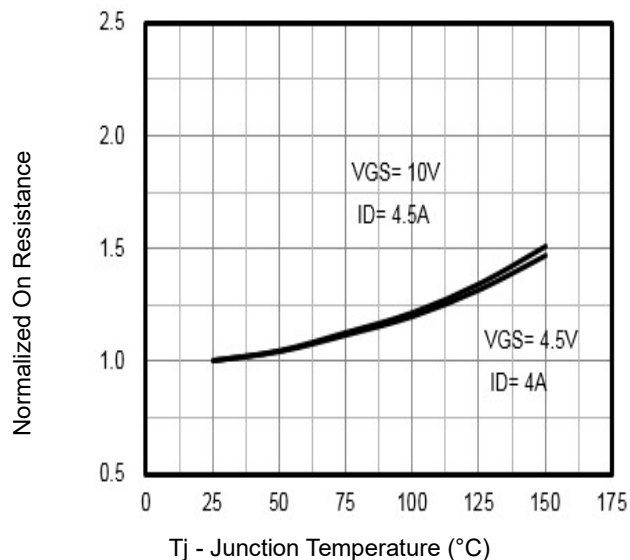
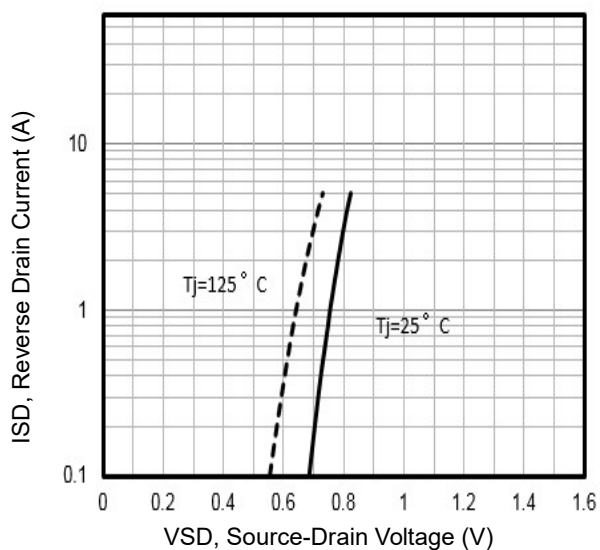
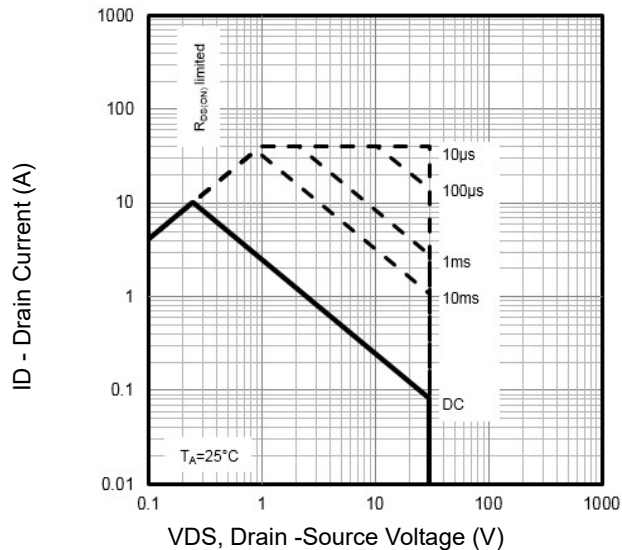
Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T _j =25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _j =125°C)	V _{DS} =30V, V _{GS} =0V	--	--	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.3	--	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance ②	V _{GS} =10V, I _D =4.5A	--	14	20	mΩ
		T _j =100°C	--	17	--	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance ②	V _{GS} =4.5V, I _D =4A	--	20	29	mΩ
Dynamic Electrical Characteristics @ T _j = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	390	460	530	pF
C _{oss}	Output Capacitance		65	80	95	pF
C _{rss}	Reverse Transfer Capacitance		50	60	70	pF
R _g	Gate Resistance	f=1MHz	--	3.2	--	Ω
Q _g (10V)	Total Gate Charge	V _{DS} =15V, I _D =10A, V _{GS} =10V	--	10	--	nC
Q _g (4.5V)	Total Gate Charge		--	5.3	--	nC
Q _{gs}	Gate-Source Charge		--	2	--	nC
Q _{gd}	Gate-Drain Charge		--	2.4	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =15V, I _D =10A, R _G =3.0Ω, V _{GS} =10V	--	5	--	ns
t _r	Turn-on Rise Time		--	30	--	ns
t _{d(off)}	Turn-Off Delay Time		--	12	--	ns
t _f	Turn-Off Fall Time		--	3.6	--	ns
Source- Drain Diode Characteristics@ T _j = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _{SD} =4.5A, V _{GS} =0V	--	0.8	1.2	V
t _{rr}	Reverse Recovery Time	T _j =25°C, I _{sd} =10A, V _{GS} =0V	--	5.7	--	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	--	1.3	--	nC

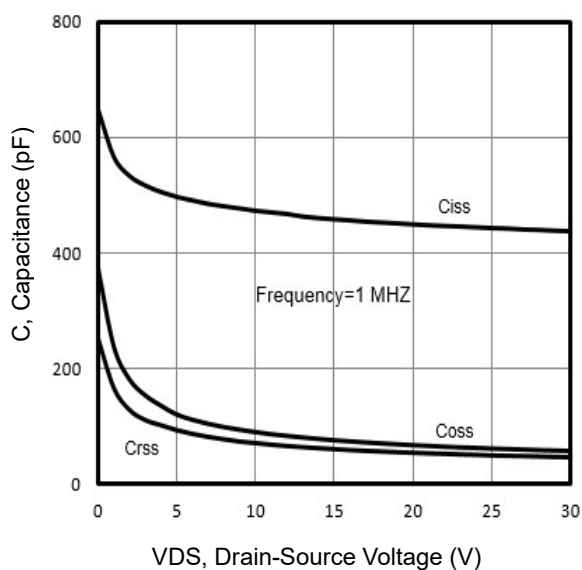
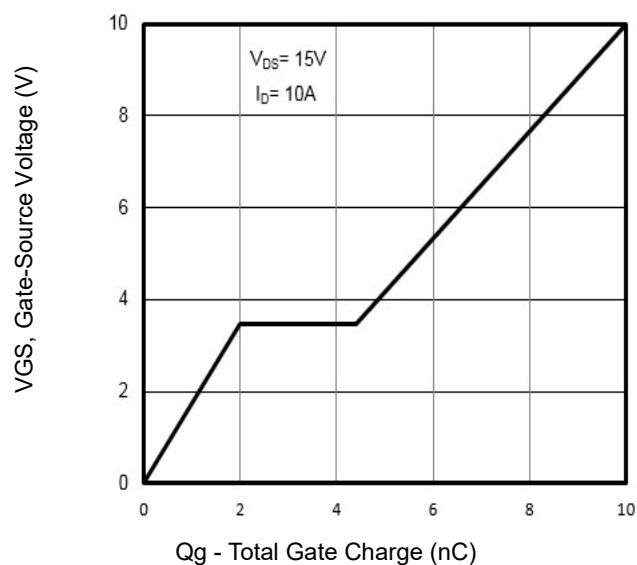
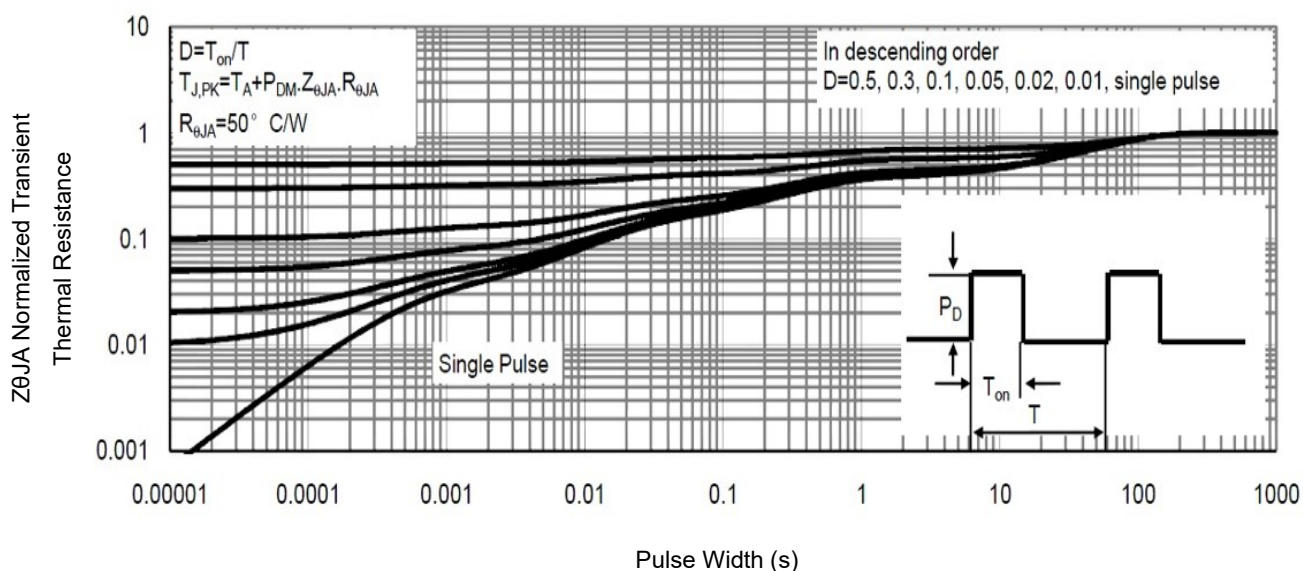
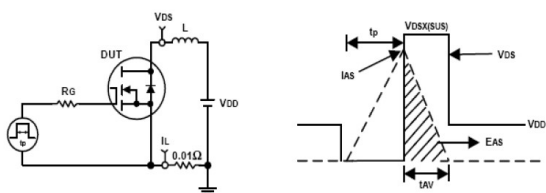
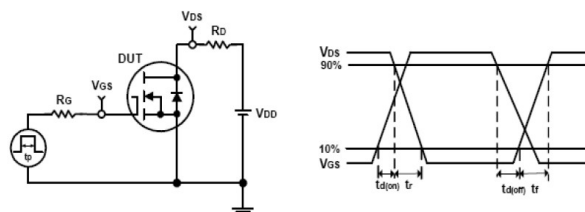
NOTE:

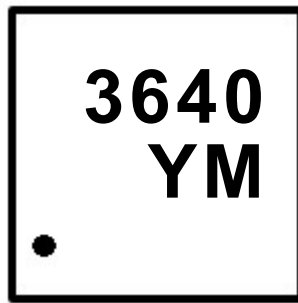
- ① Repetitive rating; pulse width limited by max junction temperature.
 ② Pulse width $\leq 300\mu s$; duty cycles $\leq 2\%$.

Typical Characteristics


Fig1. Typical Output Characteristics

Fig2. $V_{GS(TH)}$ Gate-Source Voltage Vs. T_j

Fig3. Typical Transfer Characteristics

Fig4. Normalized On-Resistance Vs. T_j

Fig5. Typical Source-Drain Diode Forward Voltage

Fig6. Maximum Safe Operating Area

Typical Characteristics


Fig7. Typical Capacitance Vs. Drain-Source Voltage

Fig8. Typical Gate Charge Vs. Gate-Source Voltage

Fig9. Normalized Maximum Transient Thermal Impedance

Fig10. Unclamped Inductive Test Circuit and waveforms

Fig11. Switching Time Test Circuit and waveforms

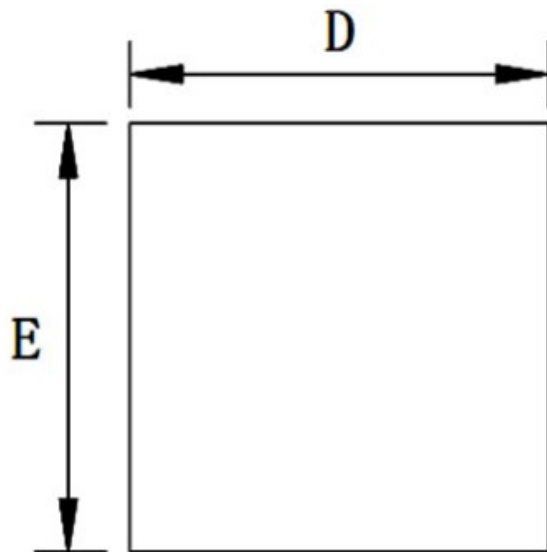
Marking Information

1st line: Part Number (3640)

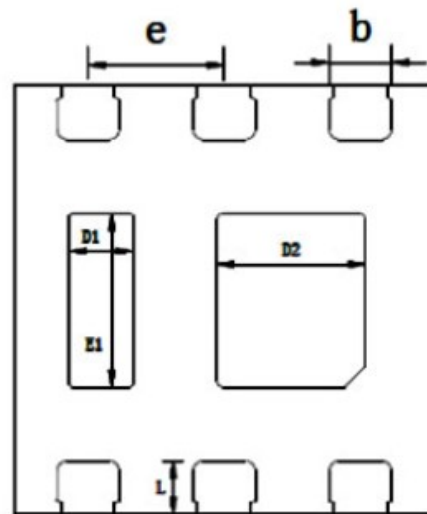
2nd line: Y: Year Code, refer to table below

M: Month Code, (e.g. 9=September, O=October, N=November, D=December, etc)

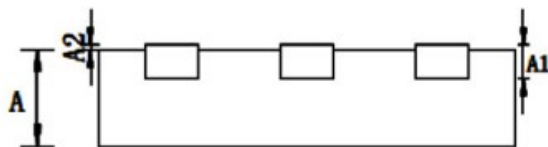
Code	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030

DFN2x2x0.75-6L Package Outline Data


Top View



Bottom View



Side View

Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	0.70	0.75	0.80
A1	--	0.15 REF	--
A2	0.00	0.02	0.05
L	0.20	0.25	0.30
b	0.25	0.30	0.35
D	1.95	2.00	2.05
E	1.95	2.00	2.05
e	0.65 BSC		
D2	0.61	0.71	0.81
D1	0.20	0.30	0.40
E1	0.71	0.81	0.91

Customer Service

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