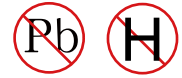




YEA SHIN TECHNOLOGY CO., LTD

YSE2516QCE

Dual N-Channel Enhancement MOSFET



VDS= 20V, ID= 11A

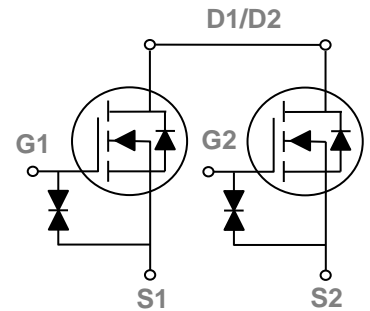
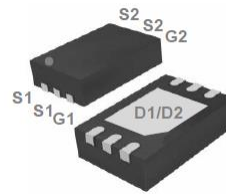
Features

- 20V, 11A, $R_{DS(ON)} = 8.2m\Omega @ V_{GS} = 4.5V$
- Improved dv/dt capability
- Fast switching
- G-S ESD Protection Diode Embedded
- Green Device Available

Applications

- Handheld Instruments
- POL Applications
- Battery Protection Applications

DFN2x3 Dual Pin Configuration



Absolute Maximum Rating $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current – Continuous ($T_c=25^\circ\text{C}$)	11	A
	Drain Current – Continuous ($T_c=70^\circ\text{C}$)	8.8	A
I_{DM}	Drain Current – Pulsed ¹	70	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	1.56	W
	Power Dissipation – Derate above 25°C	0.0125	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	80	$^\circ\text{C}/\text{W}$

DEVICE CHARACTERISTICS

YSE2516QCE

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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=18V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=16V, V_{GS}=0V, T_J=70^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 10	μA

On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance	$V_{GS}=4.5V, I_D=5.5A$	4.5	6	8.2	$m\Omega$
		$V_{GS}=4V, I_D=5.5A$	4.7	6.2	8.5	$m\Omega$
		$V_{GS}=3.7V, I_D=5.5A$	5	6.5	9	$m\Omega$
		$V_{GS}=3.1V, I_D=5.5A$	5.5	7	9.4	$m\Omega$
		$V_{GS}=2.5V, I_D=5.5A$	6	8.2	11	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	0.72	1.5	V
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=5.5A$	---	20	---	S

Dynamic and Switching Characteristics

Q_g	Total Gate Charge ^{2,3}	$V_{DS}=15V, V_{GS}=4.5V, I_D=11A$	---	15	30	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	2.8	5.6	
Q_{gd}	Gate-Drain Charge ^{2,3}		---	4.4	8.8	
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=15V, V_{GS}=10V, R_G=6\ \Omega, I_D=5.5A$	---	28	56	ns
T_r	Rise Time ^{2,3}		---	64	128	
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	60	120	
T_f	Fall Time ^{2,3}		---	55	110	
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$	---	1350	2500	pF
C_{oss}	Output Capacitance		---	185	350	
C_{rss}	Reverse Transfer Capacitance		---	160	300	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	11	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1	V

Note :

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.

DEVICE CHARACTERISTICS

YSE2516QCE

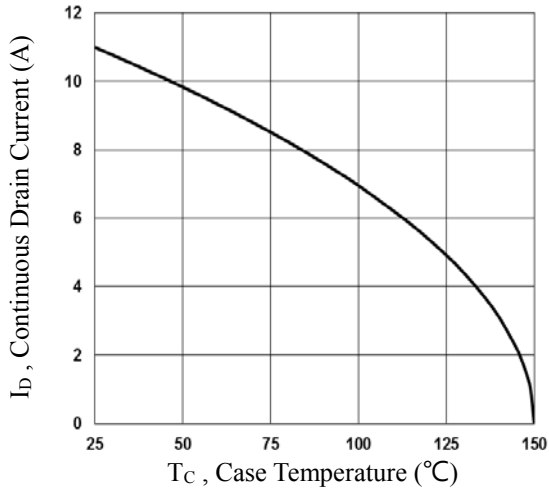


Fig.1 Continuous Drain Current vs. T_c

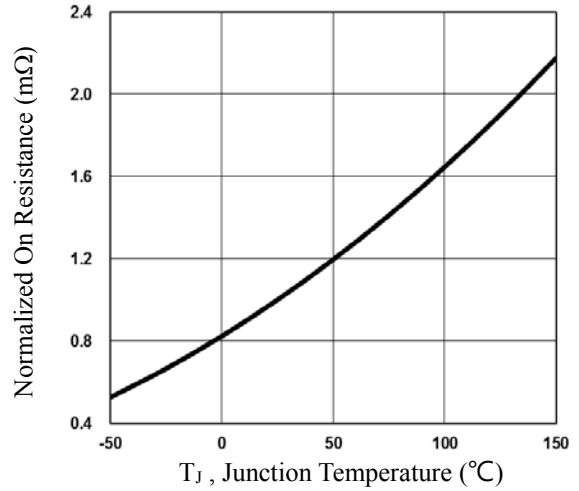


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

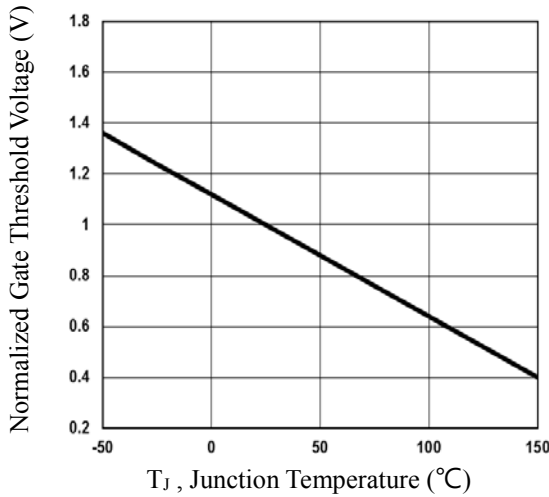


Fig.3 Normalized V_{th} vs. T_j

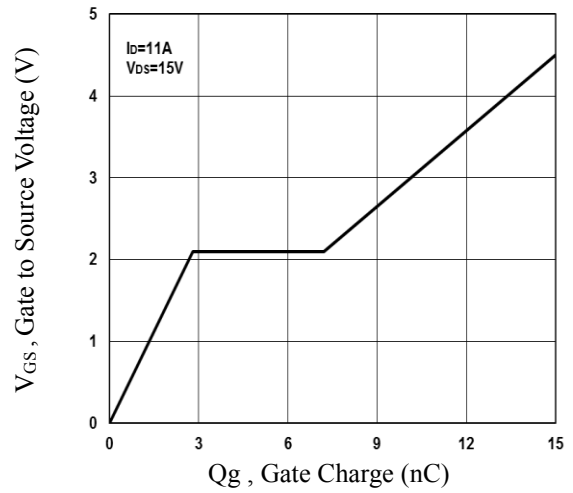


Fig.4 Gate Charge Waveform

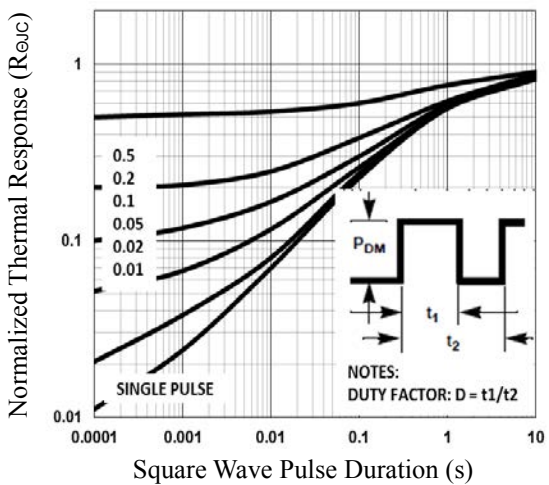


Fig.5 Normalized Transient Response

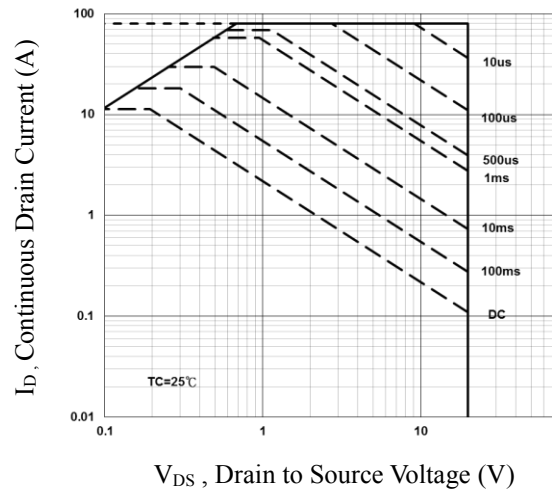


Fig.6 Maximum Safe Operation Area

DEVICE CHARACTERISTICS

YSE2516QCE

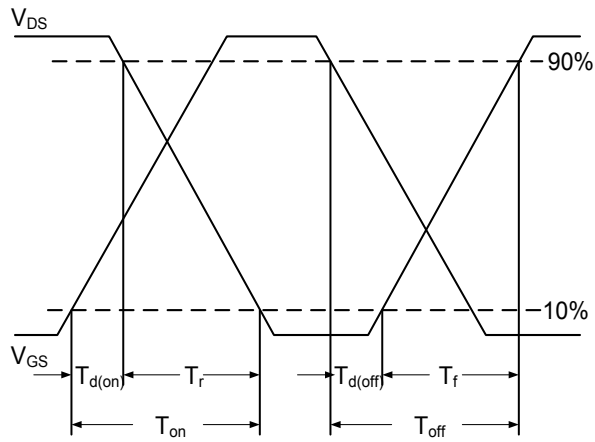


Fig.7 Switching Time Waveform

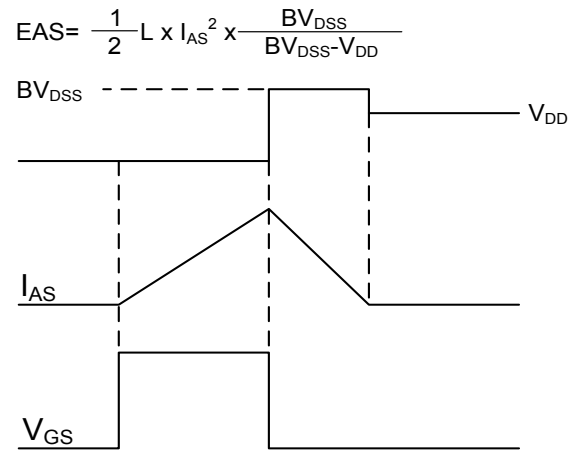
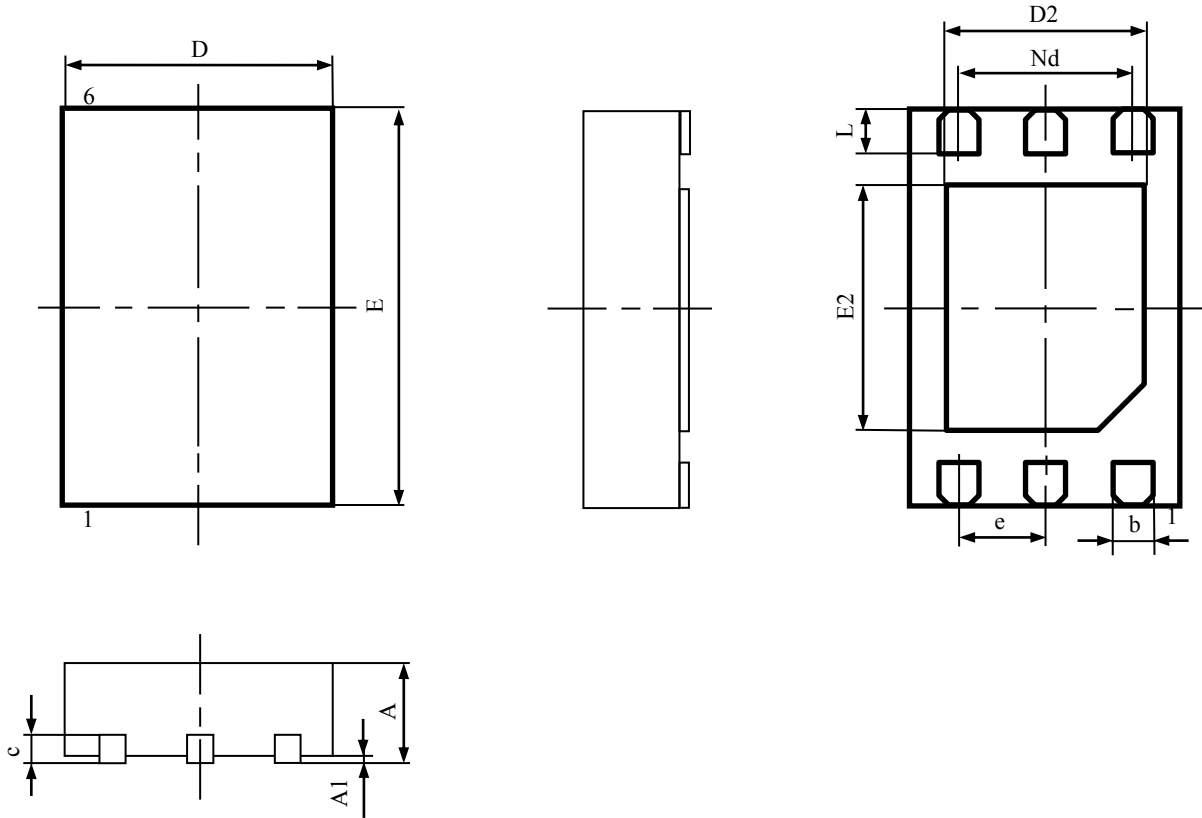


Fig.8 EAS Waveform

PACKAGE OUTLINE & DIMENSIONS

YSE2516QCE

DFN2X3 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.800	0.700	0.031	0.028
A1	0.050	0.02typ.	0.002	0.001typ.
b	0.350	0.200	0.014	0.008
c	0.250	0.180	0.010	0.007
D	2.100	1.900	0.083	0.075
D2	1.600	1.400	0.063	0.055
e	0.5BSC		0.02BSC	
Nd	1.0BSC		0.04BSC	
E	3.100	2.900	0.122	0.114
E2	1.750	1.650	0.069	0.065
L	0.400	0.300	0.016	0.012