P-Channel Logic Level Enhancement Mode MOSFET with Schottky Diode

MSFA0M02X8

MOSFET product Summary

BV_{DSS}	-20V
$R_{DSON(MAX)}$	100mΩ
I_D	-3A

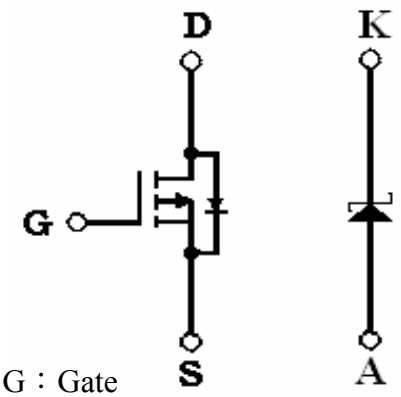
Schottky Product Summary

V_{KA}	20V
V_F	0.46V
I_F	1A

Features

- Simple drive requirement
- Low on-resistance
- Fast switching speed
- Pb-free lead plating and halogen-free package

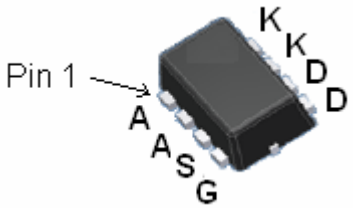
Symbol



G：Gate
S：Source
D：Drain
A: Anode
K: Cathode

Outline

DFN3x2



Absolute Maximum Ratings (T_A=25°C, unless otherwise noted)

Parameter		Symbol	Limits	Unit
Drain-Source Breakdown Voltage		BV_{DSS}	-20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current @T_A=25 °C		I_D	-3	A
Continuous Drain Current @T_A=70 °C		I_D	-2.4	
Pulsed Drain Current (Note 1)		I_{DM}	-12	
Average Forward Current (Schottky)		I_F	1	
Pulsed Forward Current (Schottky)		I_{FM}	3	
Power Dissipation (MOSFET)	T_A=25 °C	P_D	1.5	W
	T_A=70 °C		0.9	
Power Dissipation (Schottky)	T_A=25 °C		1.2	
	T_A=70 °C		0.76	
Operating Junction and Storage Temperature Range		Tj; Tstg	-55~+150	°C

Note : 1. Pulse width limited by maximum junction temperature. Duty cycle≤1%.

Thermal Resistance Ratings

Parameter	Symbol	Maximum	Unit
Thermal Resistance, Junction-to-case(MOSFET)	$R_{th,j-c}$	40	°C/W
Thermal Resistance, Junction-to-ambient(MOSFET)	$R_{th,j-a}$	85	
Thermal Resistance, Junction-to-case(Schottky)	$R_{th,j-c}$	50	
Thermal Resistance, Junction-to-ambient(Schottky)	$R_{th,j-a}$	105	

Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-20	-	-	V	V_{GS}=0V, I_D=-250μA
$V_{GS(th)}$	-0.3	-0.75	-1.2	V	V_{DS}=V_{GS}, I_D=-250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±12V, V_{DS}=0V
I_{DSS}	-	-	-1	μA	V_{DS}=-16V, V_{GS}=0V
	-	-	-10	μA	V_{DS}=-16V, V_{GS}=0, T_J=125°C
$I_{D(ON)}$	-3	-	-	A	V_{DS}=-5V, V_{GS}=-4.5V
*$R_{DS(ON)}$	-	85	100	mΩ	I_D=-3A, V_{GS}=-4.5V
	-	120	150		I_D=-2.5A, V_{GS}=-2.5V
*G_{FS}	-	4.5	-	S	V_{DS}=-5V, I_D=-3A
Dynamic					
Ciss	-	1033	-	pF	V_{DS}=-10V, V_{GS}=0, f=1MHz
Coss	-	386	-		
Crss	-	367	-		
Rg	-	6.5	-	Ω	V_{GS}=15mV, V_{DS}=0V, f=1MHz

*$t_{d(ON)}$	-	15	-	ns	V_{DS}=-10V, I_D=-1A, V_{GS}=-4.5V, R_{GS}=6Ω
*t_r	-	30	-		
*$t_{d(OFF)}$	-	35	-		
*t_f	-	30	-		
*Qg	-	10	-	nC	V_{DS}=-10V, I_D=-3A, V_{GS}=-4.5V
*Qgs	-	3.6	-		
*Qgd	-	3	-		
Source-Drain Diode					
*V_{SD}	-	-	1.2	V	V_{GS}=0V, I_F=I_S
*I_S	-	-	-2.5	A	
*I_{SM}	-	-	-10	A	

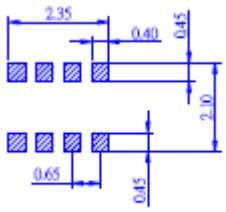
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Schottky Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
*V_F	-	0.40	0.46	V	I_F=0.5A
	-	0.47	0.56		I_F=1A
	-	0.44	0.53		I_F=1A, T_J=125°C
I_{RM}	-	0.008	0.08	mA	V_R=5V
	-	2.8	28		V_R=5V, T_J=125°C
	-	0.009	0.09		V_R=20V
	-	3.2	32		V_R=20V, T_J=125°C
C_T	-	30	-	pF	V_R=10V

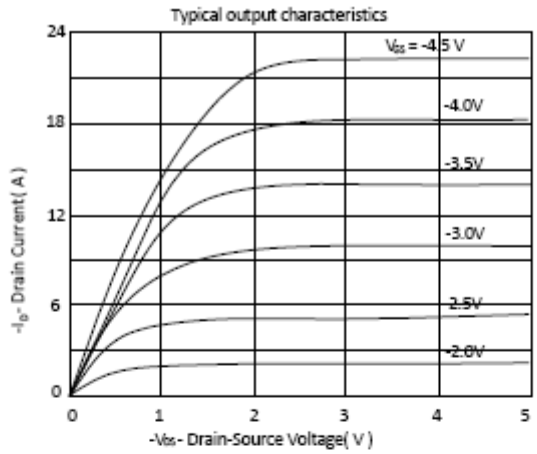
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

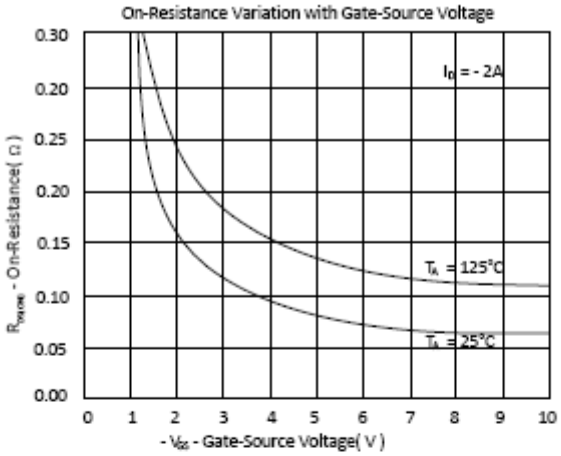
Recommended Footprint

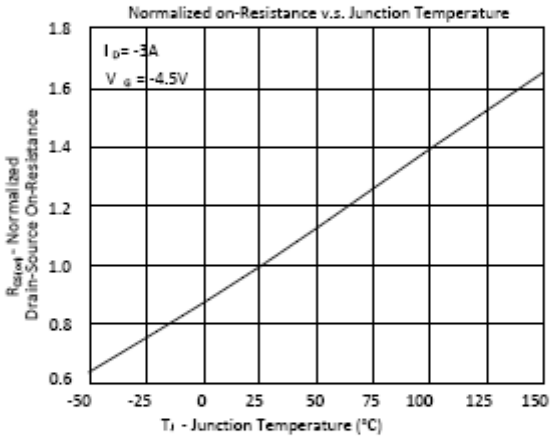


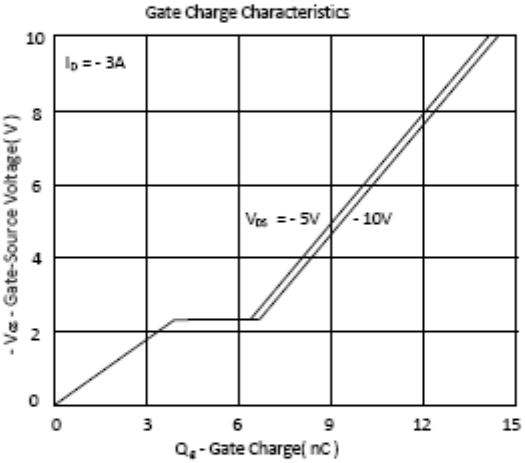
Characteristic Curves

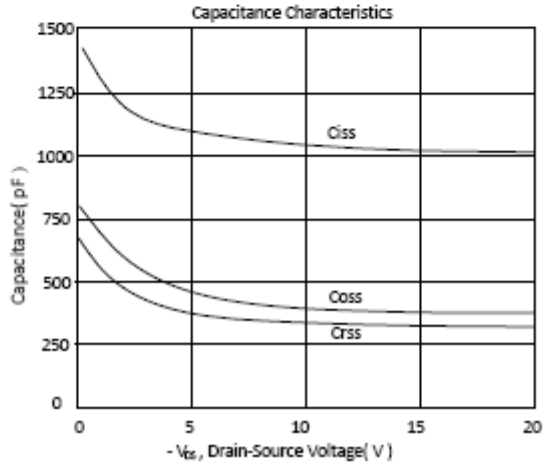
MOSFET TYPICAL CHARACTERISTICS

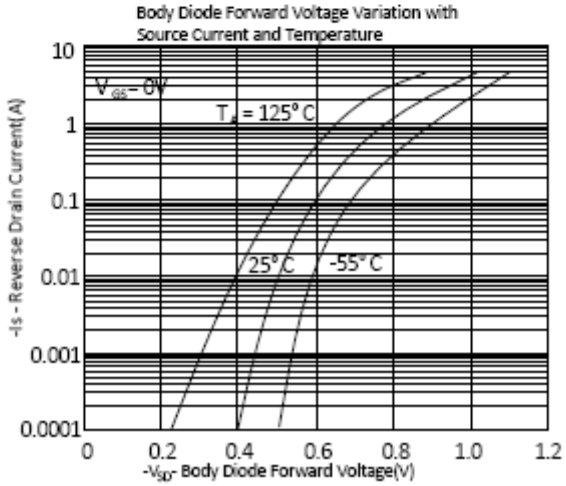




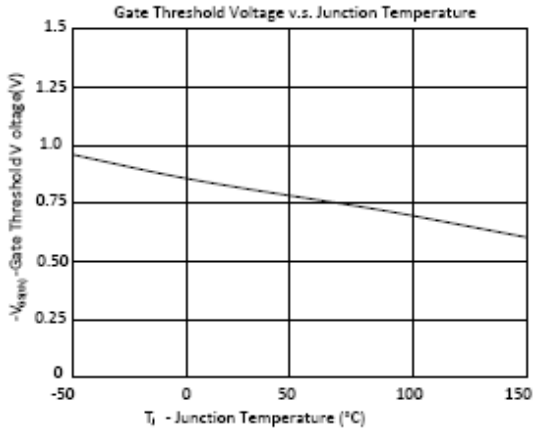


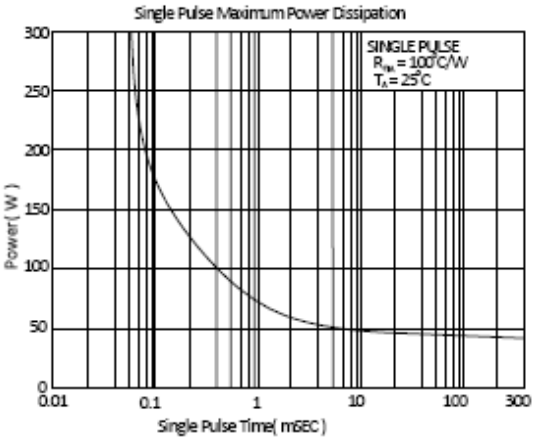


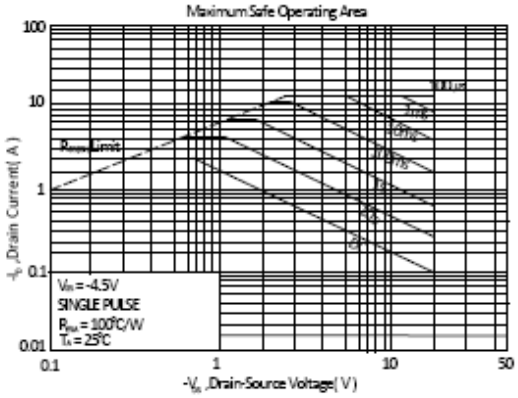


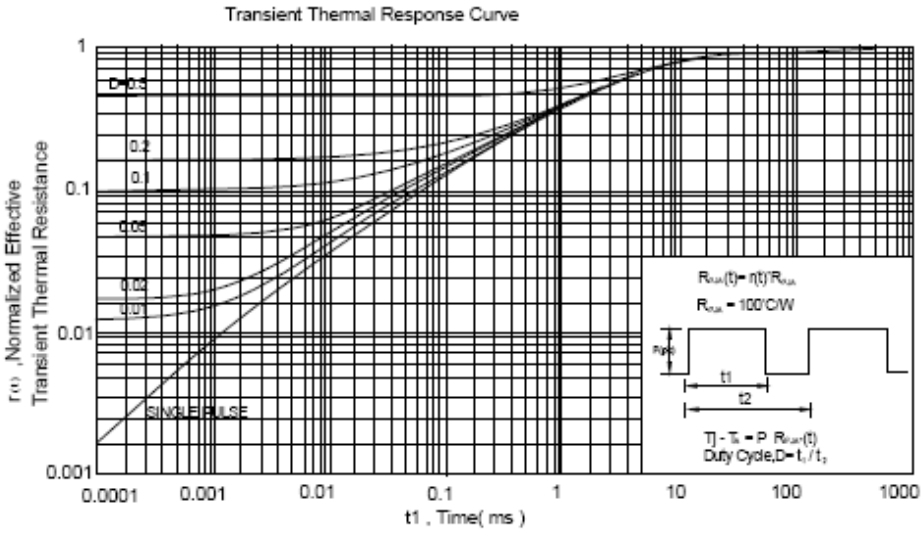


Characteristic Curves(Cont.)

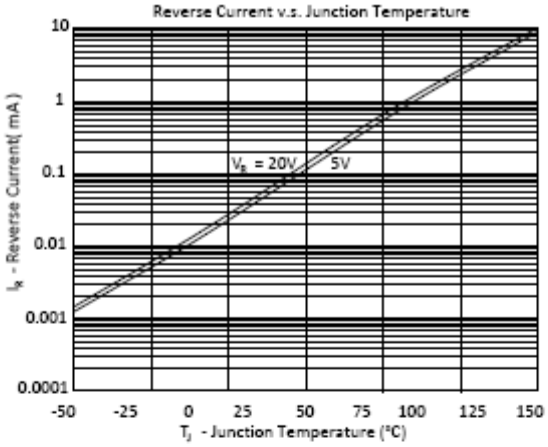


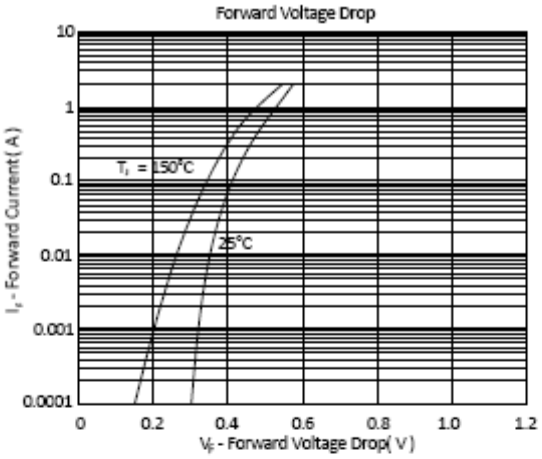


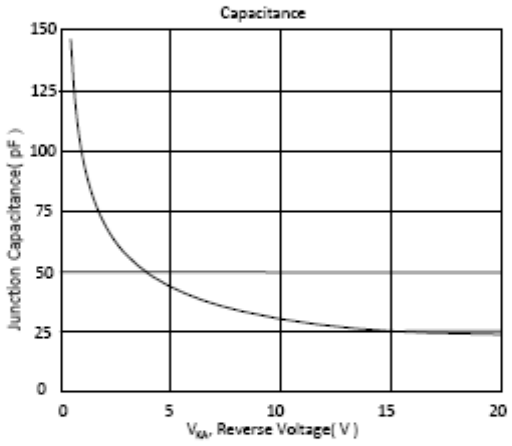


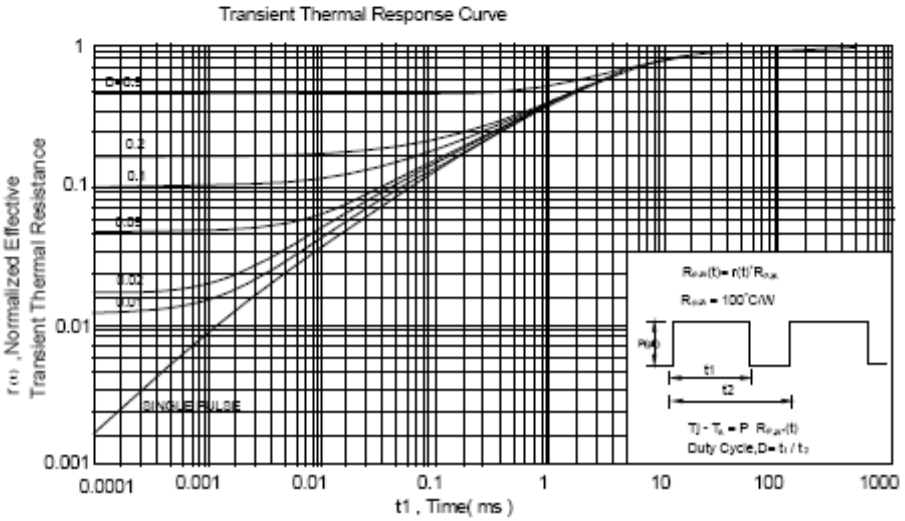


Schottky Characteristic Curves

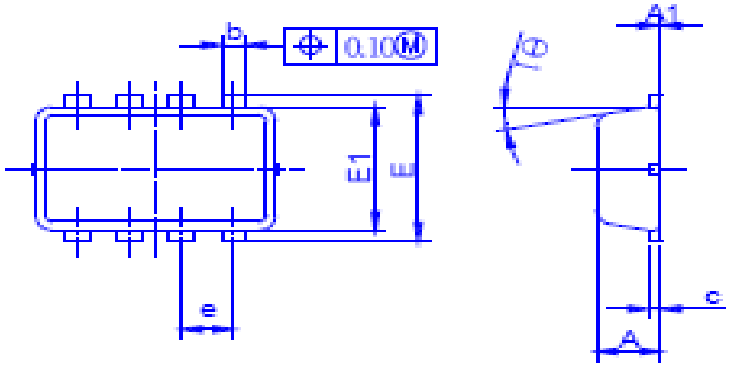


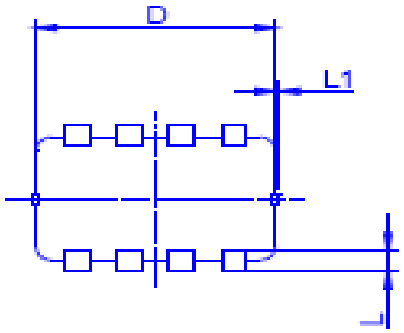




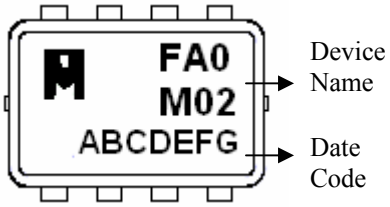


DFN3x2 Dimension





Marking:



8-Lead DFN3x2 Plastic Package
CYStek Package Code: X8

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0276	0.0354	0.70	0.90	E1	*0.0689		*1.75	
A1	0.0000	0.0020	0.00	0.05	e	*0.0256		*0.65	
b	0.0094	0.0138	0.24	0.35	L	0.0079	0.0157	0.20	0.40
c	0.0031	0.0098	0.08	0.25	L1	0.0000	0.0039	0.00	0.10
D	*0.0118		*3.00		θ1	0°	12°	0°	12°
E	*0.0079		*2.00						

Notes: 1.Controlling dimension: millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: pure tin plated
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0