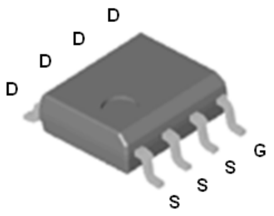
P0603BV

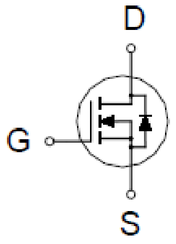
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30V	6mΩ @V_{GS} = 10V	16A



SOP- 08



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_A = 25 °C	I_D	16	A
	T_A = 70 °C		13	
Pulsed Drain Current[1]		I_{DM}	70	
Avalanche Current		I_{AS}	48	
Avalanche Energy	L = 0.1mH	E_{AS}	113	mJ
Power Dissipation	T_A = 25 °C	P_D	2.5	W
	T_A = 70 °C		1.6	
Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		50	°C / W

[1] Pulse width limited by maximum junction temperature.

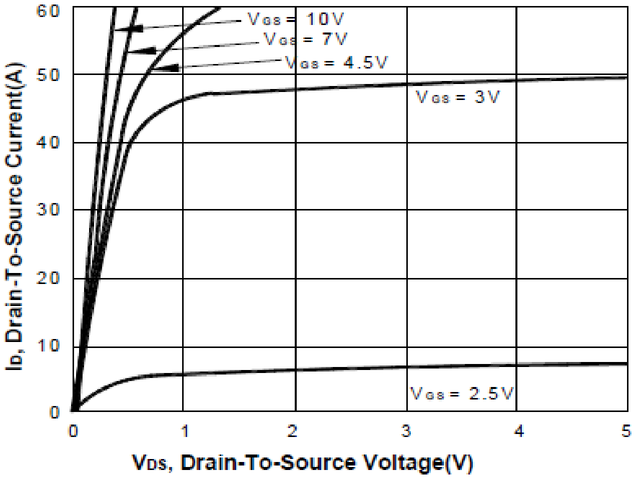
ELECTRICAL CHARACTERISTICS (T_A = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250µA	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	1	1.6	3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V			1	µA
		V_{DS} = 20V, V_{GS} = 0V , T_J = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 14A		6.2	12	mΩ
		V_{GS} = 10V, I_D = 17A		4.6	6	
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 17A		80		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		2410		pF
Output Capacitance	C_{oss}			567		
Reverse Transfer Capacitance	C_{rss}			351		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.3		Ω
Total Gate Charge[2]	Q_g V_{GS}=10V	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = 10V, I_D = 17A		50		nC
	Q_g V_{GS}=4.5V			25		
Gate-Source Charge[2]	Q_{gs}			7		
Gate-Drain Charge[2]	Q_{gd}			10		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 15V,R_L=15Ω I_D ≅ 1A, V_{GS} = 10V, R_{GEN} = 6Ω		10		nS
Rise Time[2]	t_r			9		
Turn-Off Delay Time[2]	$t_{d(off)}$			45		
Fall Time[2]	t_f			10		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_A = 25 °C)						
Forward Voltage[1]	V_{SD}	I_F = 17A, V_{GS} = 0V			1.2	V
Diode Reverse Recovery Time	t_{rr}	I_F = 17A, dI/dt=300A/µs			43	nS
Diode Reverse Recovery Charge	Q_{rr}				32	nC

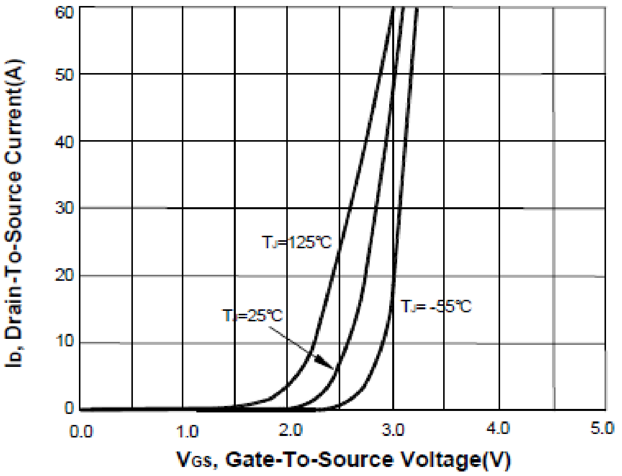
[1] Pulse test : Pulse Width ≤ 300 µsec, Duty Cycle ≤ 2%.

[2] Independent of operating temperature.

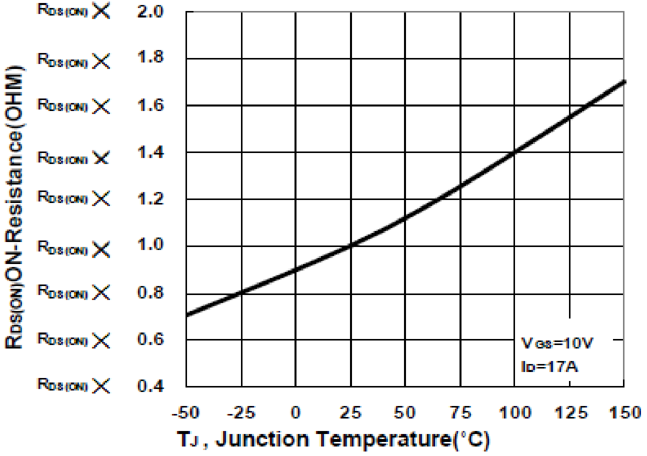
Output Characteristics



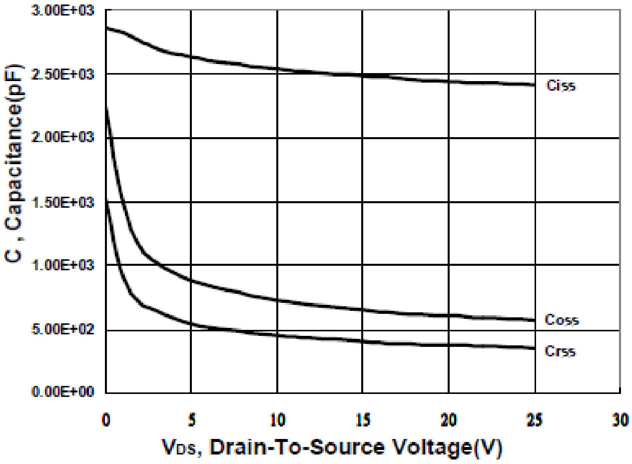
Transfer Characteristics



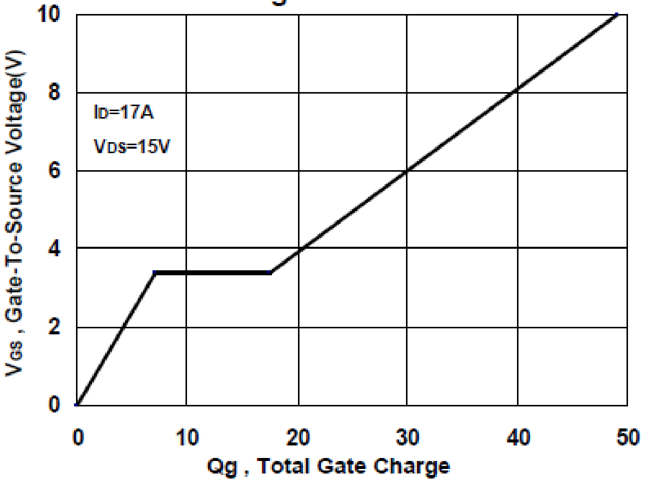
On-Resistance VS Temperature



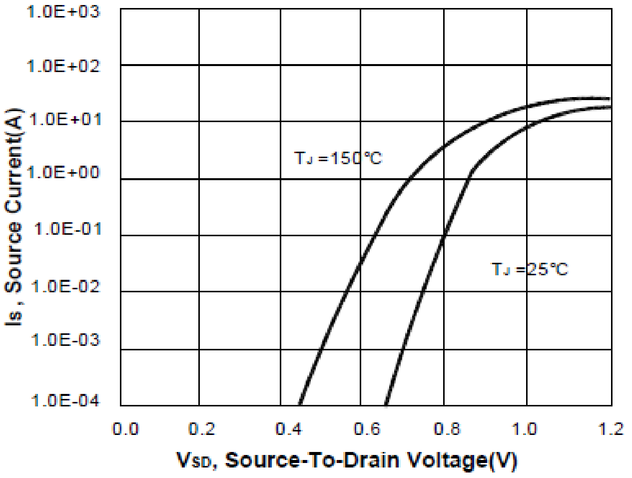
Capacitance Characteristic

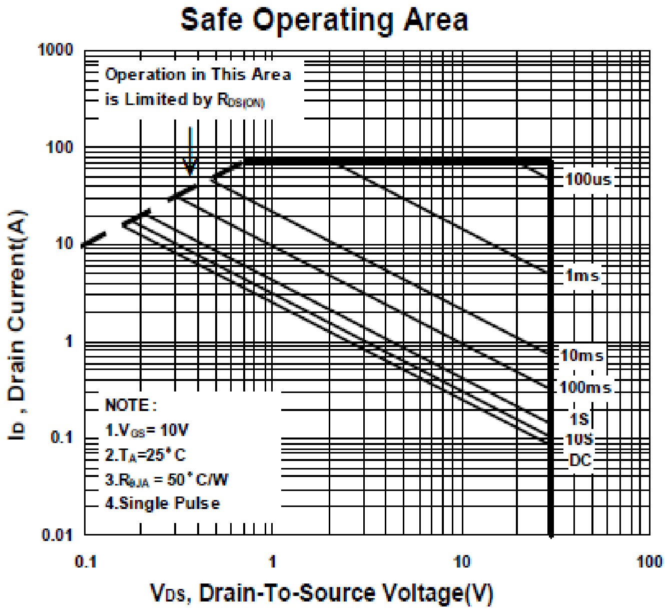


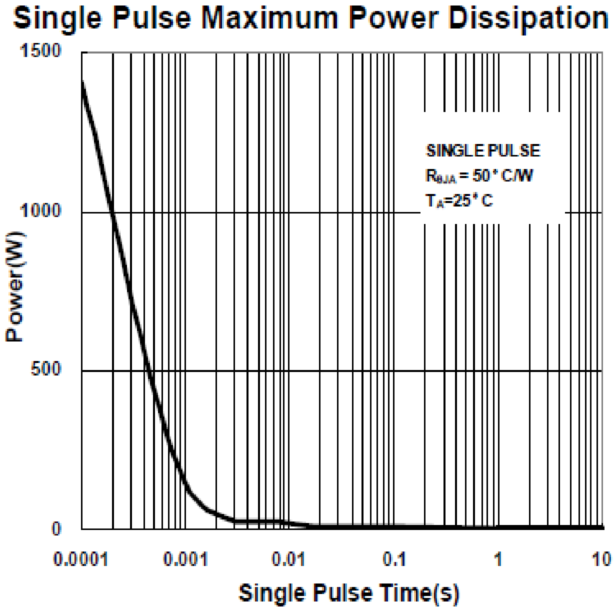
Gate charge Characteristics

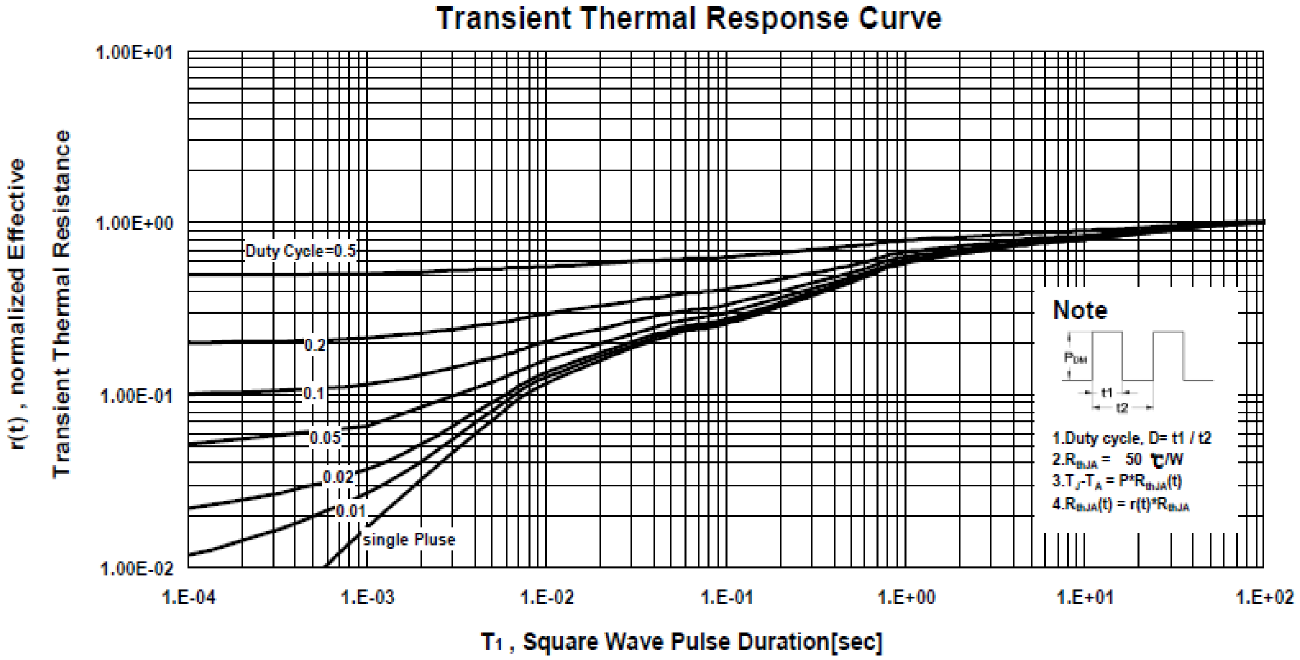


Source-Drain Diode Forward Voltage




Safe Operating Area
1000
100
10
1
0.1
0.01
0.1
1
10
100
Operation in This Area
is Limited by $R_{DS(ON)}$
100us
1ms
10ms
100ms
1S
10S
DC
NOTE :
1.V_{GS}= 10V
2.T_A=25°C
3.$R_{θJA}$ = 50°C/W
4.Single Pulse
I_D , Drain Current(A)
V_{DS}, Drain-To-Source Voltage(V)


Single Pulse Maximum Power Dissipation
1500
1000
500
0
0.0001
0.001
0.01
0.1
1
10
SINGLE PULSE
$R_{θJA}$ = 50°C/W
T_A=25°C
Power(W)
Single Pulse Time(s)


Transient Thermal Response Curve
1.00E+01
1.00E+00
1.00E-01
1.00E-02
1.E-04
1.E-03
1.E-02
1.E-01
1.E+00
1.E+01
1.E+02
Duty Cycle=0.5
0.2
0.1
0.05
0.02
0.01
single Pluse
Note
P_{DM}
t1
t2
1.Duty cycle, D= t1 / t2
2.R_{thJA} = 50 ℃/W
3.T_J-T_A = P*R_{thJA}(t)
4.R_{thJA}(t) = r(t)*R_{thJA}
r(t) , normalized Effective
Transient Thermal Resistance
T_1 , Square Wave Pulse Duration[sec]

Package Dimension

SOP-8 MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.8	4.9	5.0	H	0.4	0.6	0.93
B	3.8	3.9	4.0	I	0.19	0.21	0.25
C	5.79	6.0	6.2	J	0.25	0.375	0.5
D	0.33	0.4	0.51	K	0°	3°	18°
E	1.25	1.27	1.29				
F	1.1	1.3	1.65				
G	0.05	0.15	0.25