



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

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企业微信二维码



企业QQ二维码

Product Summary

Device	BV _{DSS}	R _{DS(ON)} Max	I _D T _A = +25°C
Q1 N-Channel	30V	35mΩ @ V _{GS} = 10V	6.4A
		50mΩ @ V _{GS} = 4.5V	5.1A
Q2 P-Channel	-30V	48mΩ @ V _{GS} = -10V	-5.4A
		70mΩ @ V _{GS} = -4.5V	-4.4A

Features and Benefits

- Low Input Capacitance
- Low Threshold
- Low Profile SO-8 Package

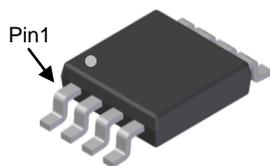
Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

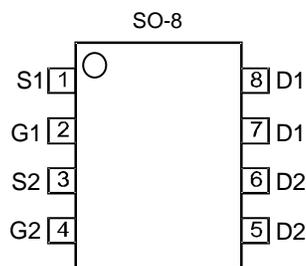
- DC-DC Converters
- Power Management Functions
- Backlighting

Mechanical Data

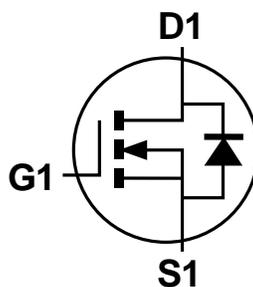
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.074 grams (Approximate)



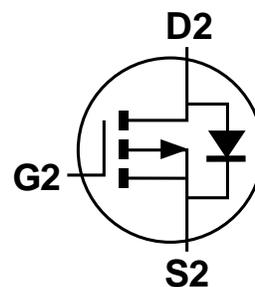
Top View



Top View
Pin Configuration



Q1 N-Channel MOSFET



Q2 P-Channel MOSFET

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

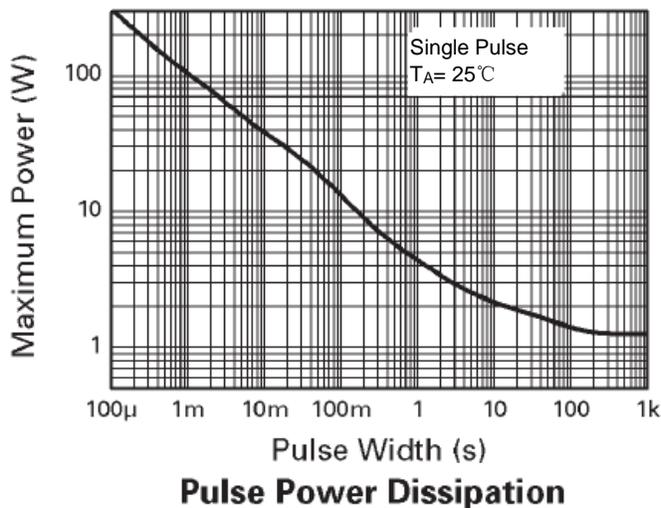
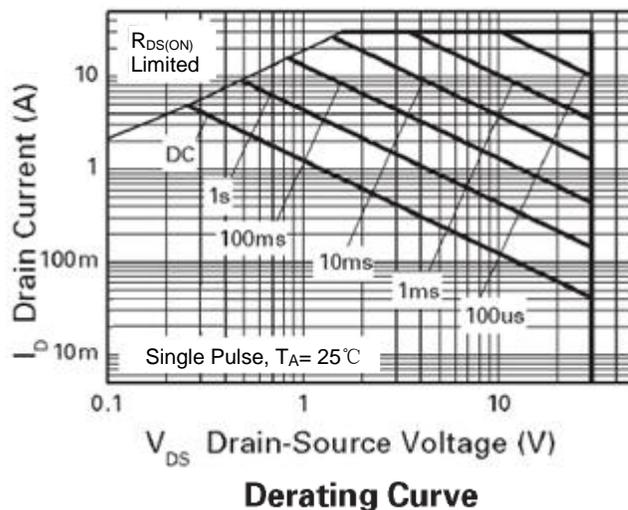
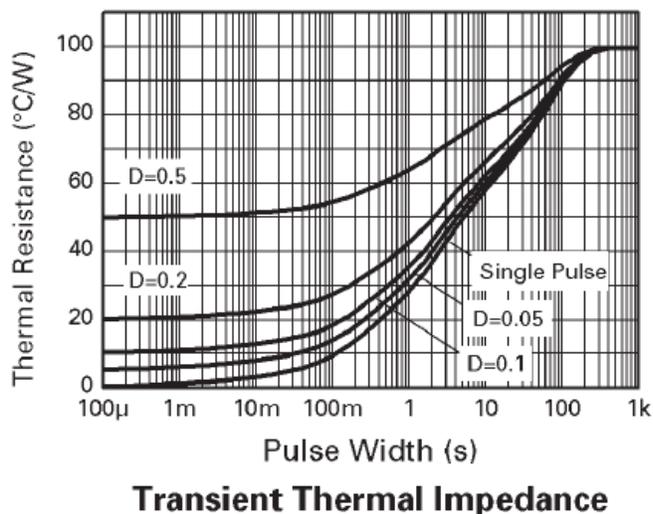
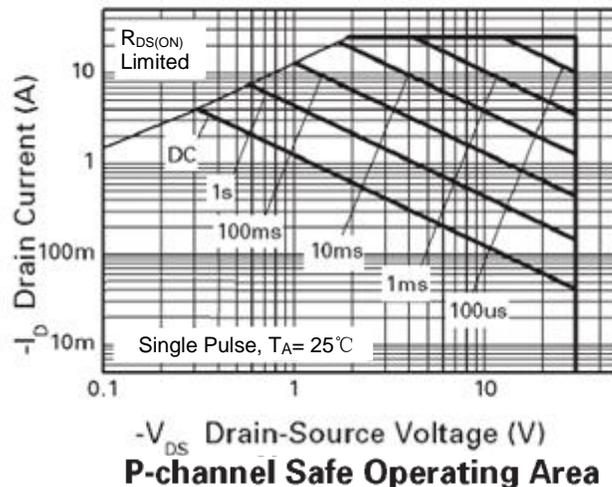
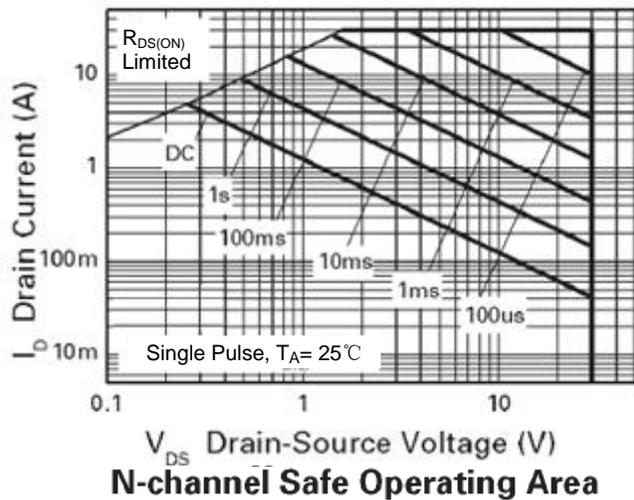
Characteristic			Symbol	Q1	Q2	Unit
Drain-Source Voltage			V_{DS}	30	-30	V
Gate-Source Voltage			V_{GS}	± 20	± 20	V
Continuous Drain Current (Note 7) $V_{GS} = -10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$	I_D	6.4	-5.4	A
		$T_A = +70^\circ\text{C}$		5.1	-4.3	
Maximum Body Diode Forward Current (Note 7)			I_S	3.4	-3.2	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)			I_{DM}	30	-25	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P_D	1.25	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	100	$^\circ\text{C/W}$
Total Power Dissipation (Note 7)	P_D	2.1	W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	60	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

- Notes: 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 7. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

Characteristics



Electrical Characteristics – N-Channel Q1 (@T_A = +25°C, unless otherwise specified.)

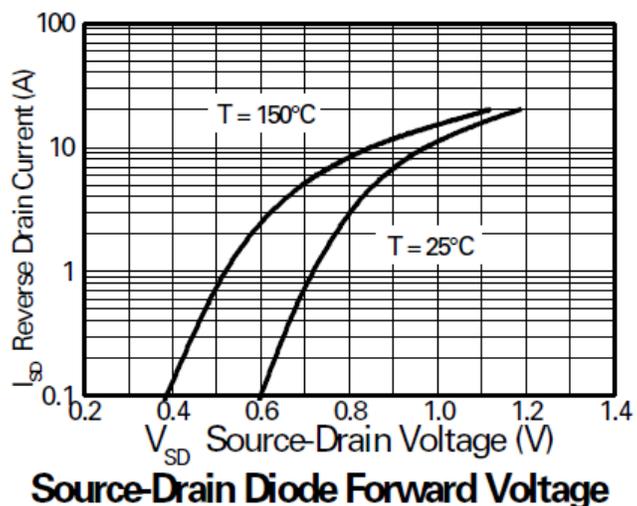
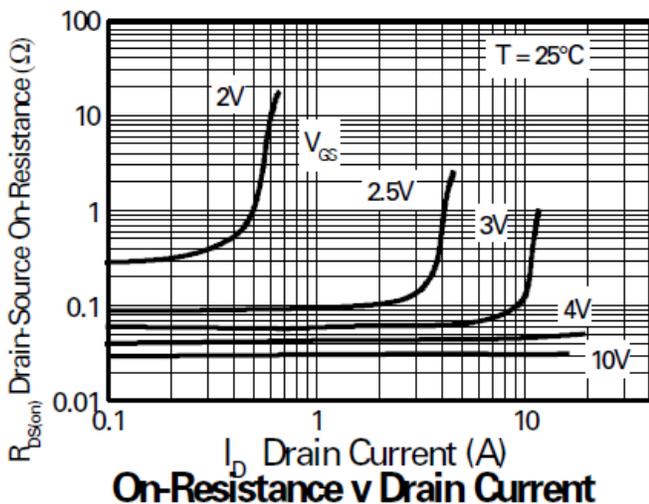
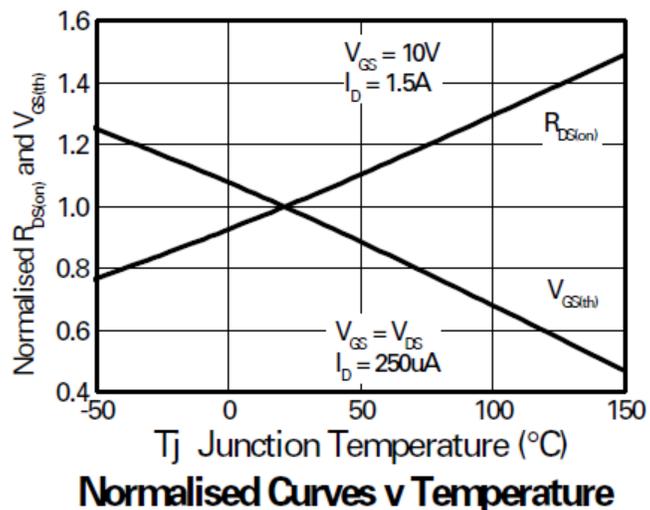
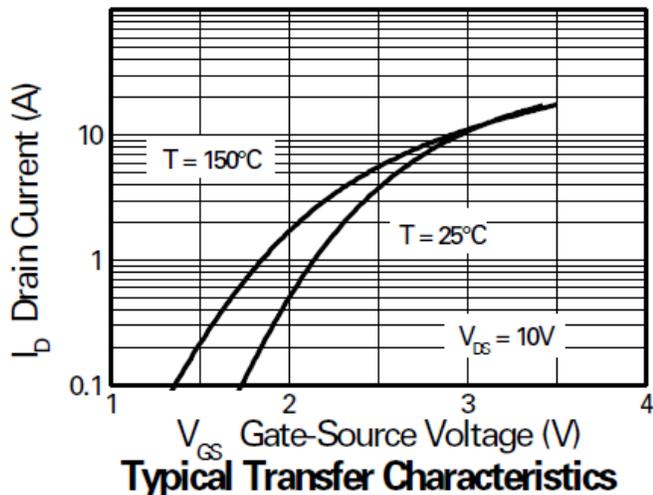
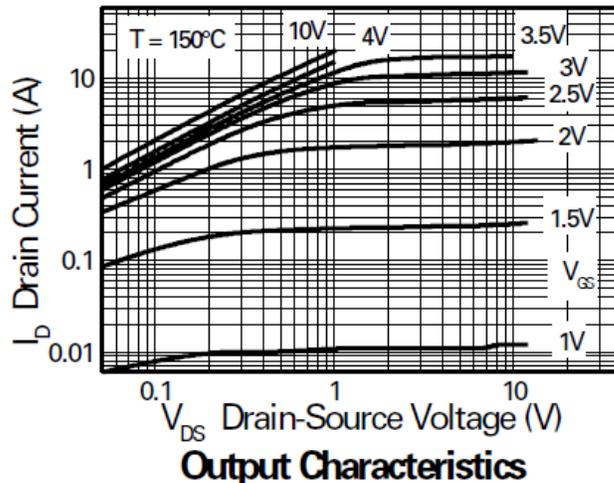
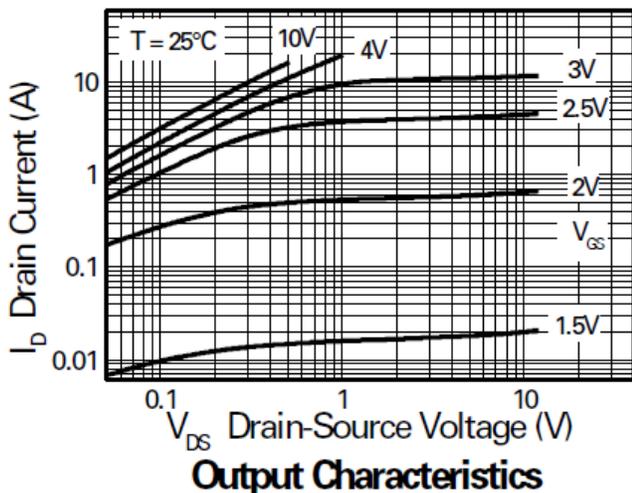
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	0.5	μA	V _{DS} = 30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	—	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	—	35	mΩ	V _{GS} = 10V, I _D = 9A
		—	—	50		V _{GS} = 4.5V, I _D = 7.4A
Diode Forward Voltage	V _{SD}	—	0.85	0.95	V	V _{GS} = 0V, I _S = 5.1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{ISS}	—	796	—	pF	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{OSS}	—	137	—		
Reverse Transfer Capacitance	C _{RSS}	—	84	—		
Total Gate Charge (V _{GS} = 10V)	Q _G	—	17.5	—	nC	V _{DS} = 15V, I _D = 3.5A
Total Gate Charge (V _{GS} = 5V)	Q _G	—	9.2	—		
Gate-Source Charge	Q _{GS}	—	2.3	—		
Gate-Drain Charge	Q _{GD}	—	3.1	—		
Turn-On Delay Time	t _{D(ON)}	—	3.0	—	ns	V _{GS} = 10V, V _{DD} = 15V, R _G = 6Ω, I _D = 3.5A
Turn-On Rise Time	t _R	—	6.4	—		
Turn-Off Delay Time	t _{D(OFF)}	—	21.6	—		
Turn-Off Fall Time	t _F	—	9.4	—		
Body Diode Reverse Recovery Time	t _{RR}	—	17.8	—	ns	I _S = 3.5A, dI/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	11.6	—	nC	I _S = 3.5A, dI/dt = 100A/μs

Electrical Characteristics – P-Channel Q2 (@T_A = +25°C, unless otherwise specified.)

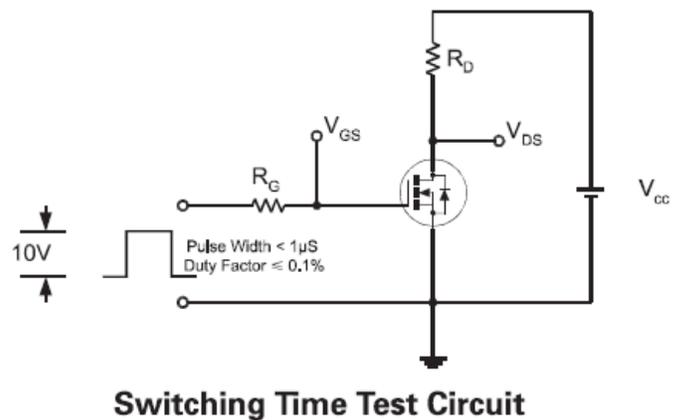
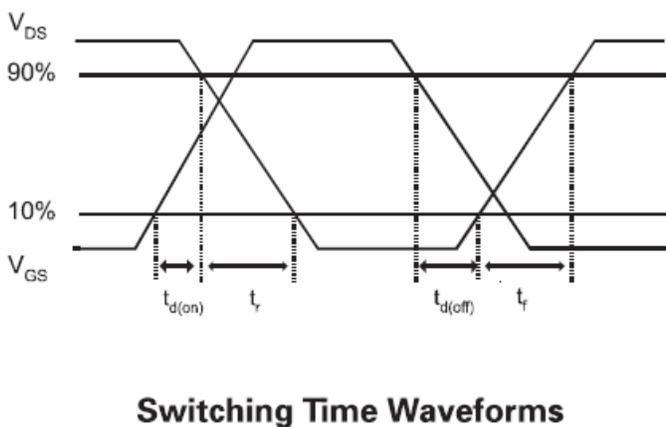
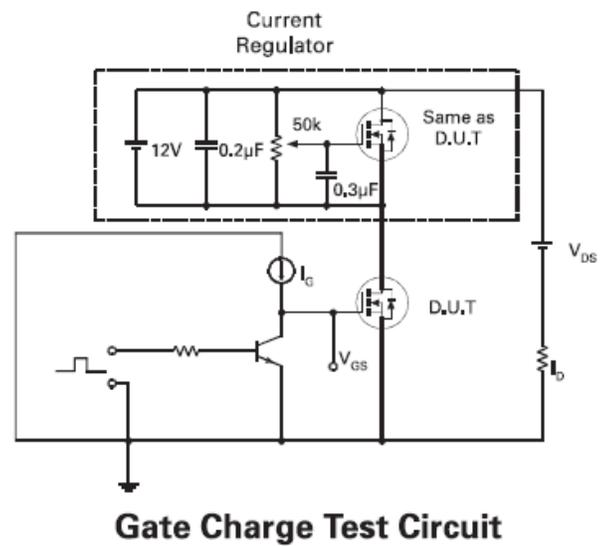
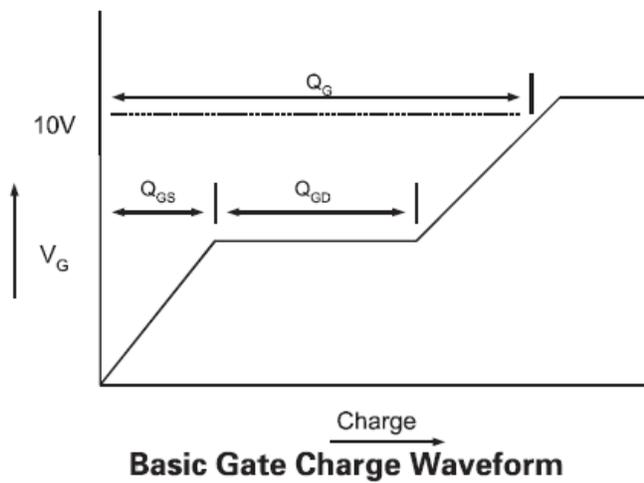
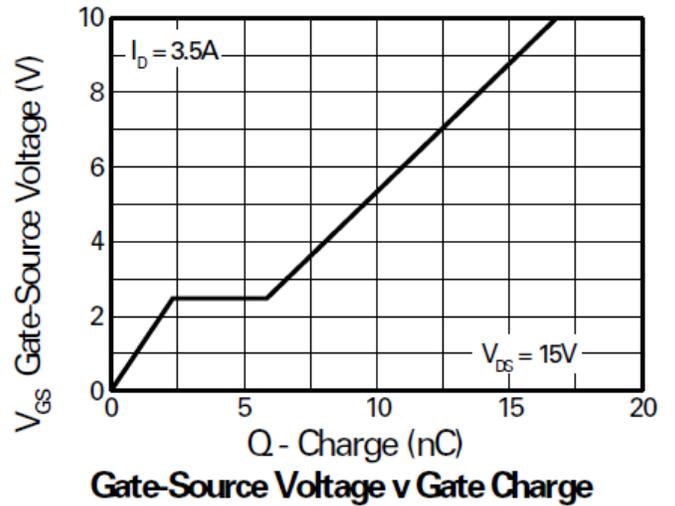
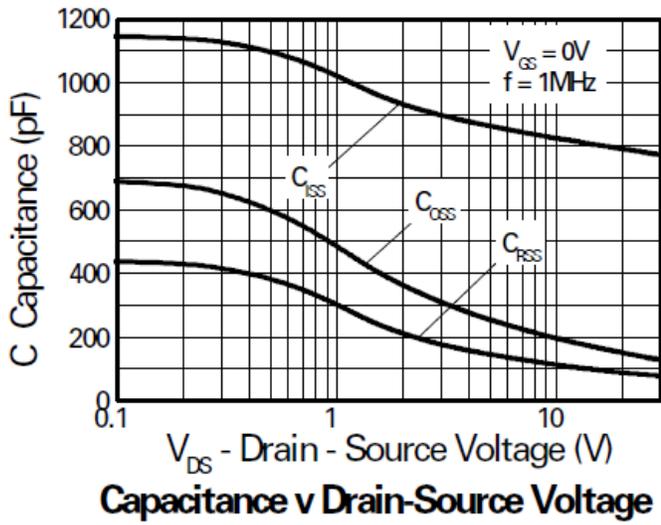
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	-100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	-1	—	—	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	—	48	mΩ	V _{GS} = -10V, I _D = -4.2A
		—	—	70		V _{GS} = -4.5V, I _D = -3.4A
Diode Forward Voltage	V _{SD}	—	-0.85	-0.95	V	V _{GS} = 0V, I _S = -3.6A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{ISS}	—	970	—	pF	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{OSS}	—	166	—		
Reverse Transfer Capacitance	C _{RSS}	—	116	—		
Total Gate Charge (V _{GS} = -5V)	Q _G	—	12.9	—	nC	V _{DS} = -15V, I _D = -4.2A
Total Gate Charge (V _{GS} = -10V)	Q _G	—	24.9	—		
Gate-Source Charge	Q _{GS}	—	2.67	—		
Gate-Drain Charge	Q _{GD}	—	3.86	—		
Turn-On Delay Time	t _{D(ON)}	—	3.8	—	ns	V _{GS} = -10V, V _{DS} = -15V, R _{GEN} = 6Ω, I _D = -1A
Turn-On Rise Time	t _R	—	6.1	—		
Turn-Off Delay Time	t _{D(OFF)}	—	35	—		
Turn-Off Fall Time	t _F	—	19	—		
Body Diode Reverse Recovery Time	t _{RR}	—	21.2	—	ns	I _S = -2A, dI/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	18.7	—	nC	I _S = -2A, dI/dt = 100A/μs

Notes: 8. Short duration pulse test used to minimize self-heating effect.
 9. Guaranteed by design. Not subject to product testing.

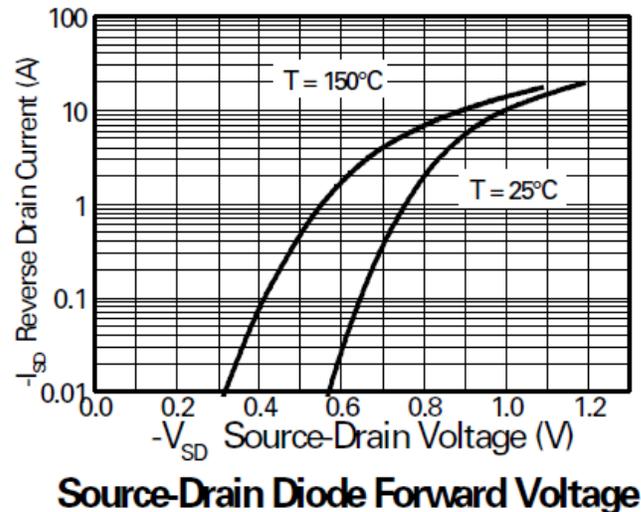
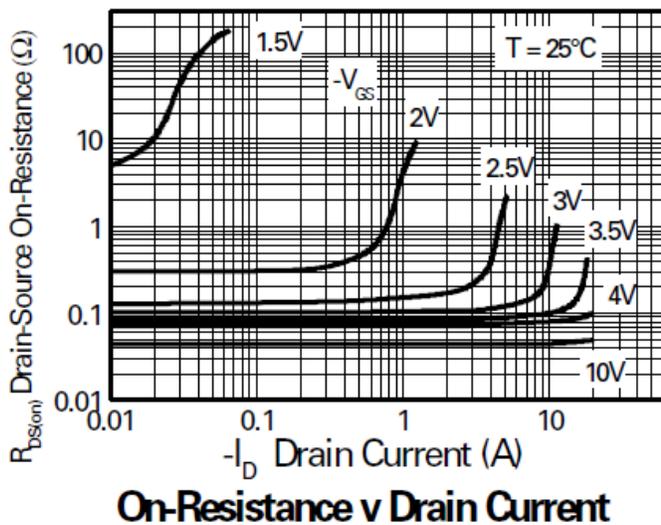
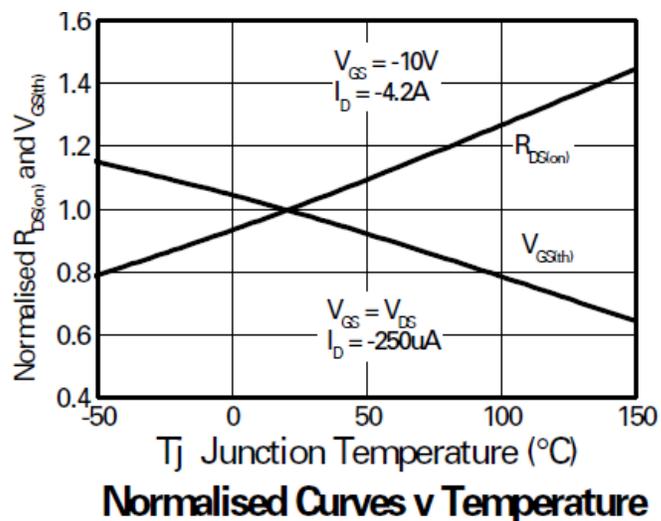
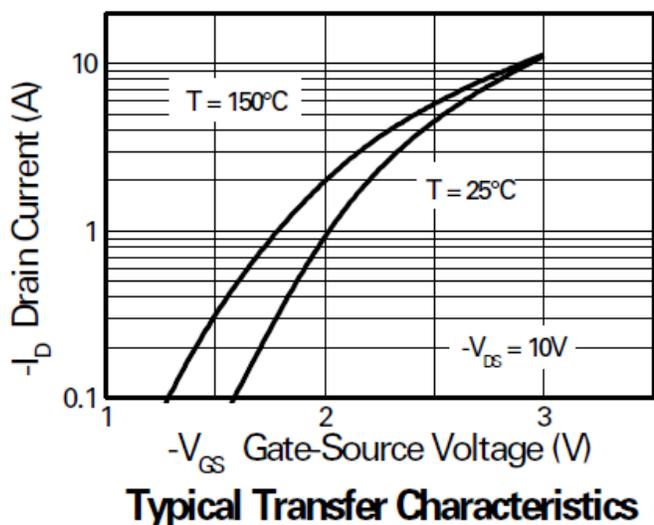
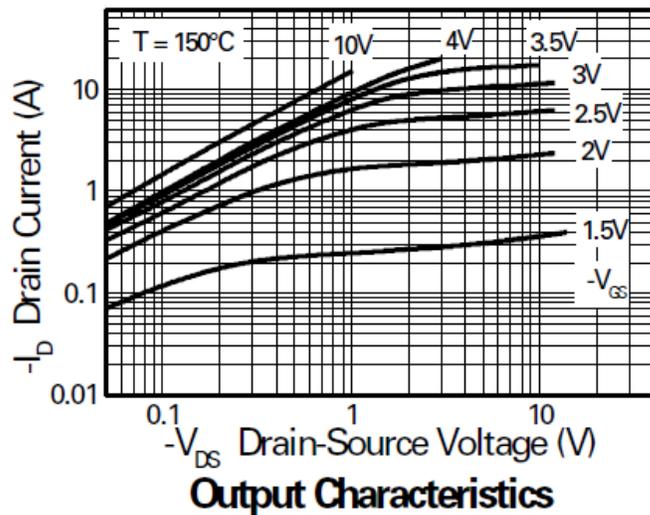
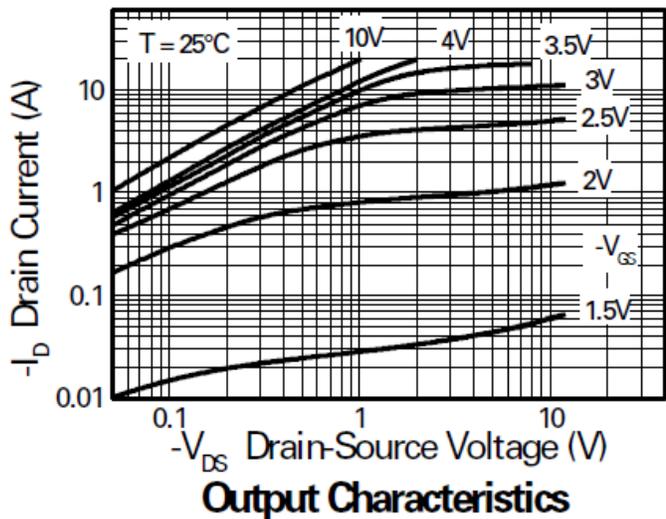
N-Channel Typical Characteristics



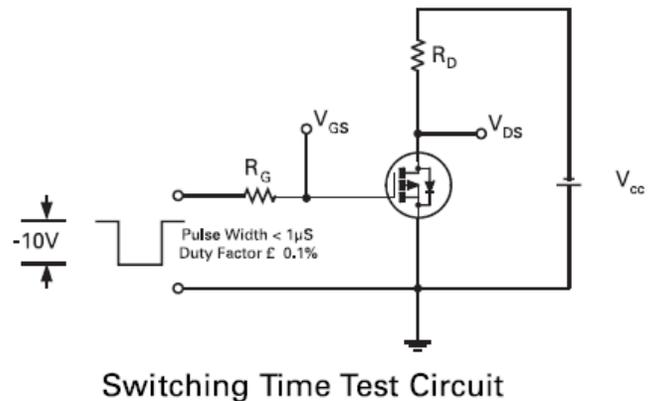
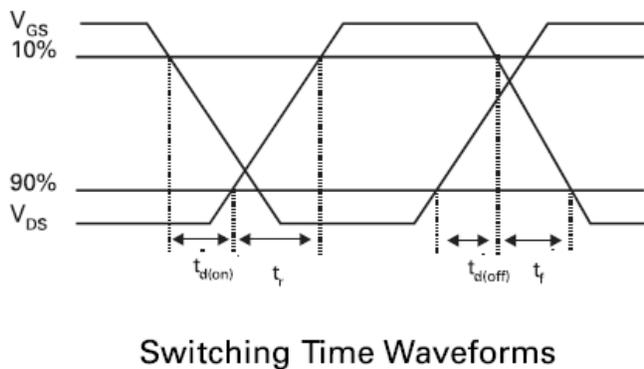
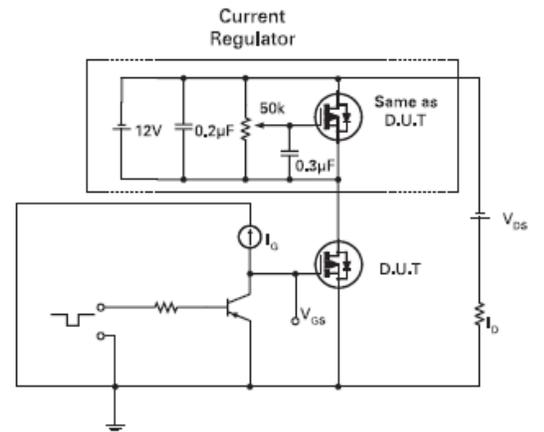
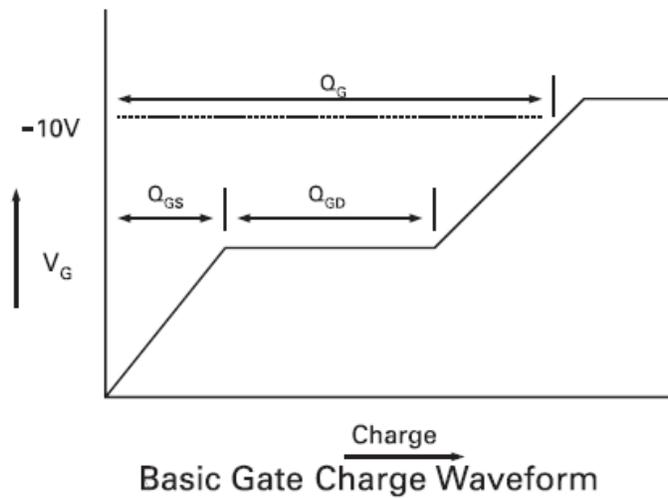
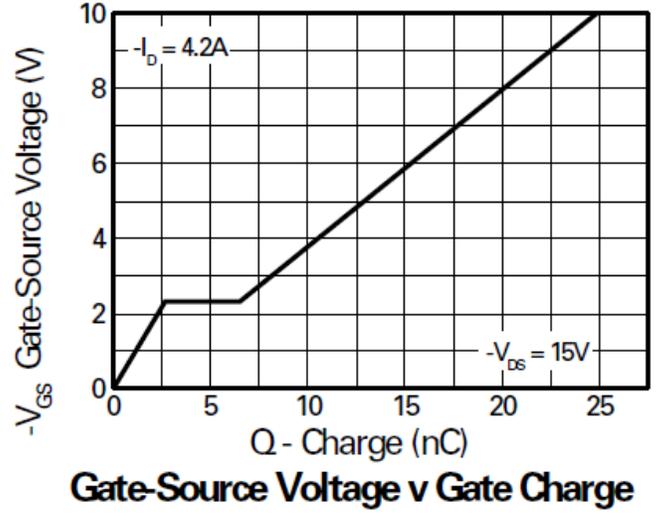
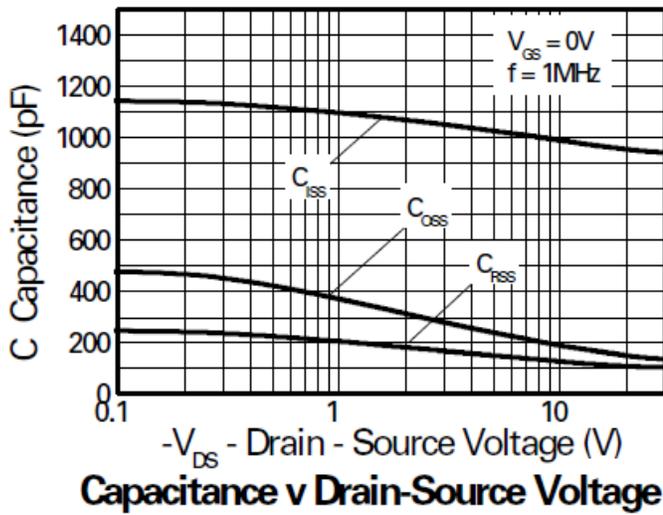
N-Channel Typical Characteristics (Cont.)



P-Channel Typical Characteristics

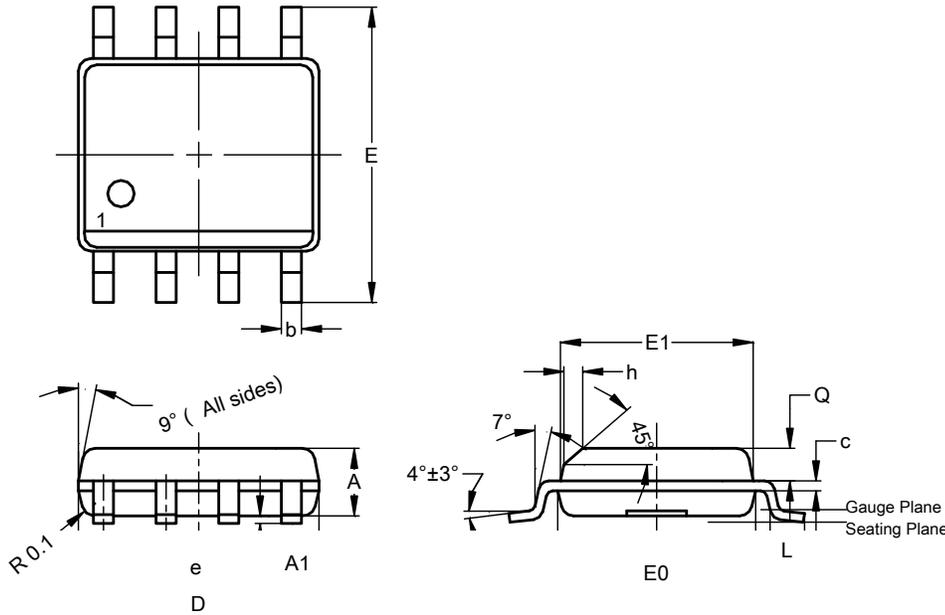


P-Channel Typical Characteristics (Cont.)



Package Outline Dimensions

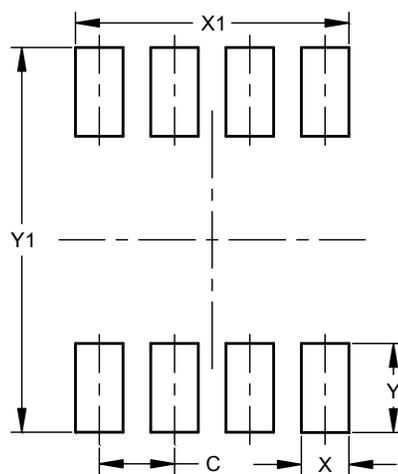
SO-8



SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	-	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

Suggested Pad Layout

SO-8



Dimensions	Value (in mm)
C	1.27
X	0.802
X1	4.612
Y	1.505
Y1	6.50