优尚

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

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Product Summary

Device	**BV_{DSS}**	**$R_{DS(ON)}$ Max**	**I_D Max T_A = +25°C**
Q1	30	0.4Ω @ V_{GS} = 10V	0.65A
		0.7Ω @ V_{GS} = 4.5V	0.52A
Q2	-30	0.9Ω @ V_{GS} = -10V	-0.45A
		1.7Ω @ V_{GS} = -4.5V	-0.33A

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed

Description and Applications

This MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

- Motor control
- Power-management functions
- DC-DC converters

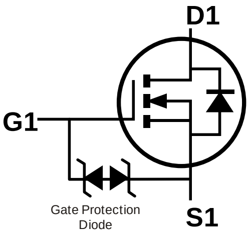
Mechanical Data

- Package: SOT363
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.027 grams (Approximate)

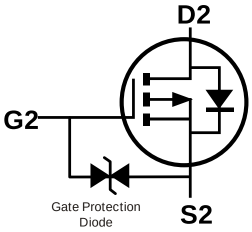
ESD PROTECTED

SOT363

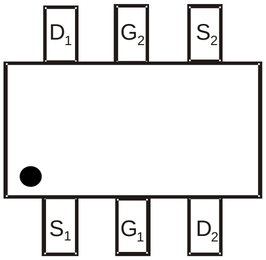
Top View



Q1 N-CHANNEAL



Q2 P-CHANNEAL



Top View
Pin Out

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value_Q1	Value_Q2	Unit
Drain-Source Voltage			V_{DSS}	30	-30	V
Gate-Source Voltage			V_{GSS}	±20	±20	V
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C	I_D	0.65	-0.45	A
		T_A = +70°C		0.50	-0.36	
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	0.4	-0.35	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	4	-3	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P_D	0.31	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	406	°C/W
Total Power Dissipation (Note 6)		P_D	0.39	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	319	°C/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	126	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
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} = 24V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±16V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.8	—	1.6	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	0.2	0.4	Ω	V_{GS} = 10V, I_D = 0.59A
		—	0.3	0.7		V_{GS} = 4.5V, I_D = 0.2A
Diode Forward Voltage	V_{SD}	—	0.8	1.2	V	V_{GS} = 0V, I_S = 0.23A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	55	—	pF	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	8.5	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	6.5	—	pF	
Gate Resistance	R_g	—	92	—	Ω	V_{DS} = V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	0.6	—	nC	V_{DS} = 10V, I_D = 250mA
Total Gate Charge (V_{GS} = 10V)	Q_g	—	1.4	—	nC	
Gate-Source Charge	Q_{gs}	—	0.2	—	nC	
Gate-Drain Charge	Q_{gd}	—	0.1	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	3.8	—	ns	V_{GS} = 10V, V_{DS} = 30V, I_D = 100mA, R_G = 1Ω
Turn-On Rise Time	t_R	—	3.5	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	25.2	—	ns	
Turn-Off Fall Time	t_F	—	18.8	—	ns	

Notes: 5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
6. Device mounted on 1” x 1” FR-4 PCB with high coverage 2oz. Copper, single sided.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
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} = -24V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±10	μA	V_{GS} = ±16V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	-1	—	-2.6	V	V_{DS} = V_{GS}, I_D = -250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	0.36	0.9	Ω	V_{GS} = -10V, I_D = -0.42A
		—	0.57	1.7		V_{GS} = -4.5V, I_D = -0.2A
Diode Forward Voltage	V_{SD}	—	-0.8	-1.2	V	V_{GS} = 0V, I_S = -0.23A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	54	—	pF	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	10	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	8.3	—	pF	
Gate Resistance	R_g	—	240	—	Ω	V_{DS} = V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	0.6	—	nC	V_{DS} = -10V, I_D = -0.24A
Total Gate Charge (V_{GS} = -10V)	Q_g	—	1.3	—	nC	
Gate-Source Charge	Q_{gs}	—	0.2	—	nC	
Gate-Drain Charge	Q_{gd}	—	0.2	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	5.7	—	ns	V_{GS} = -10V, V_{DD} = -15V, I_D = -0.5A, R_G = 1Ω
Turn-On Rise Time	t_R	—	8.8	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	35	—	ns	
Turn-Off Fall Time	t_F	—	19	—	ns	

Notes: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

Typical Characteristics - N-CHANNEL

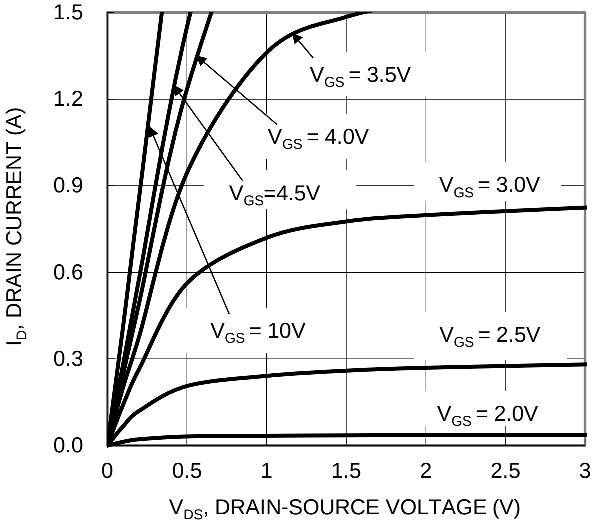


Figure 1. Typical Output Characteristic

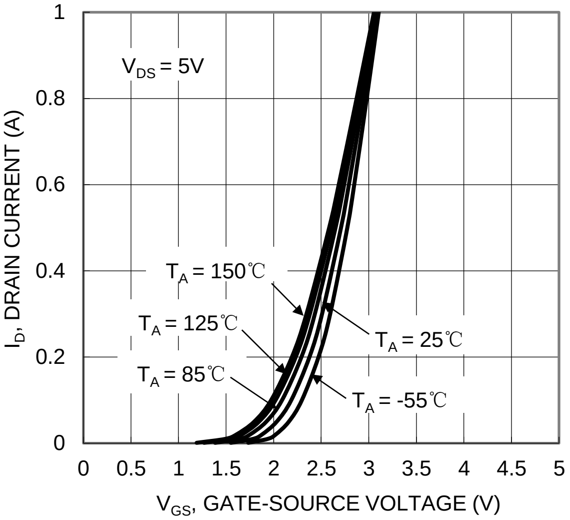


Figure 2. Typical Transfer Characteristic

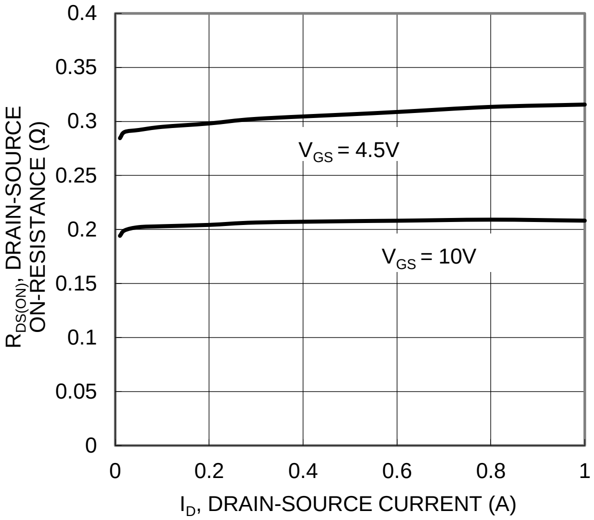


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

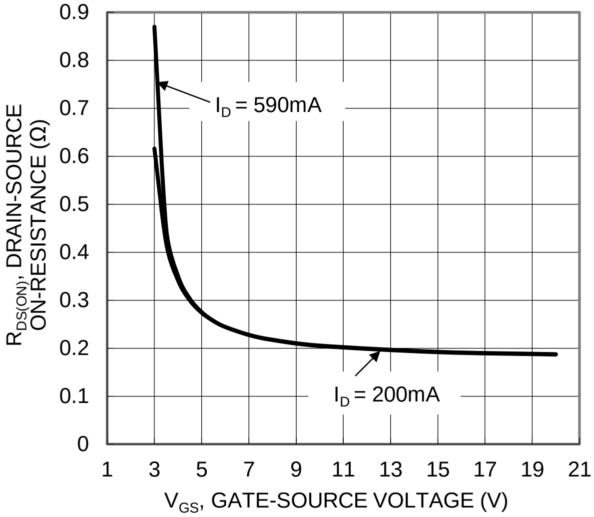


Figure 4. Typical Transfer Characteristic

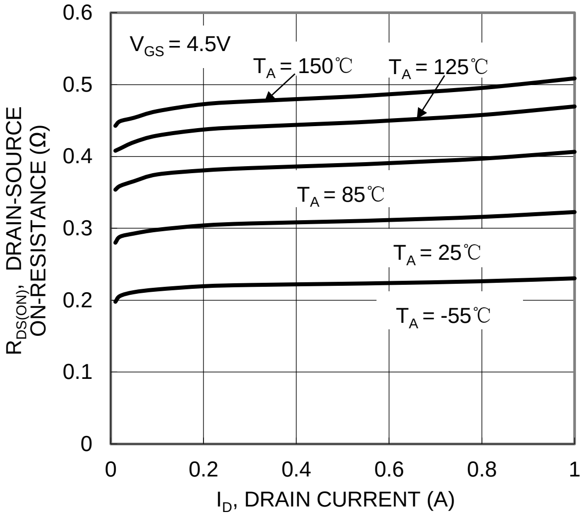


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

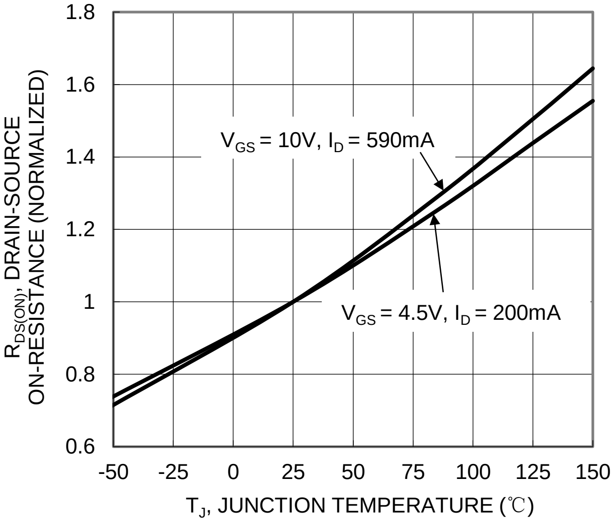


Figure 6. On-Resistance Variation with Temperature

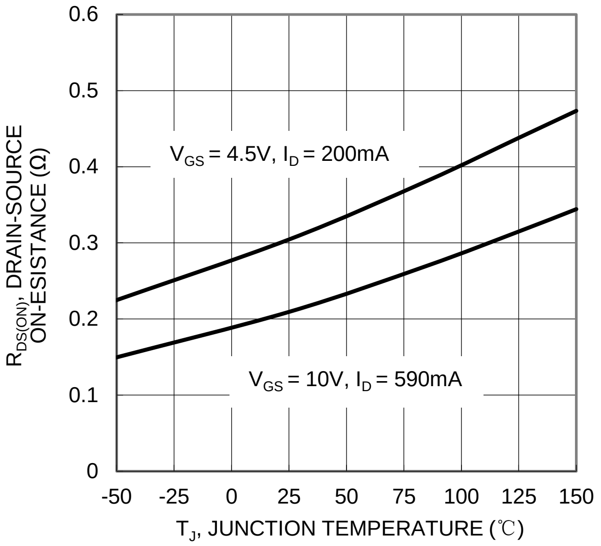


Figure 7. On-Resistance Variation with Temperature

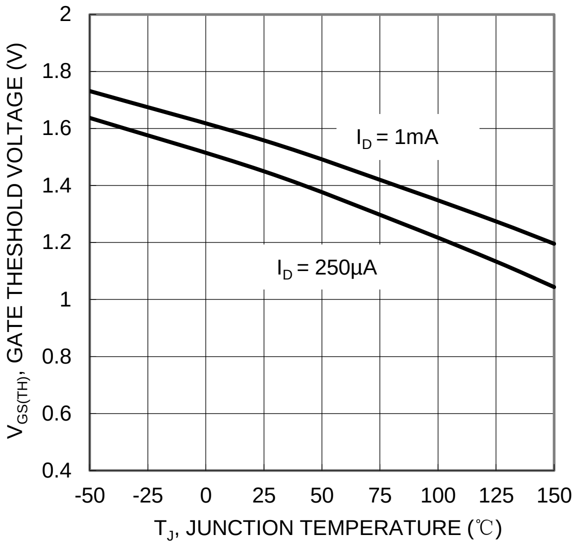


Figure 8. Gate Theshold Variation vs. Junction Temperature

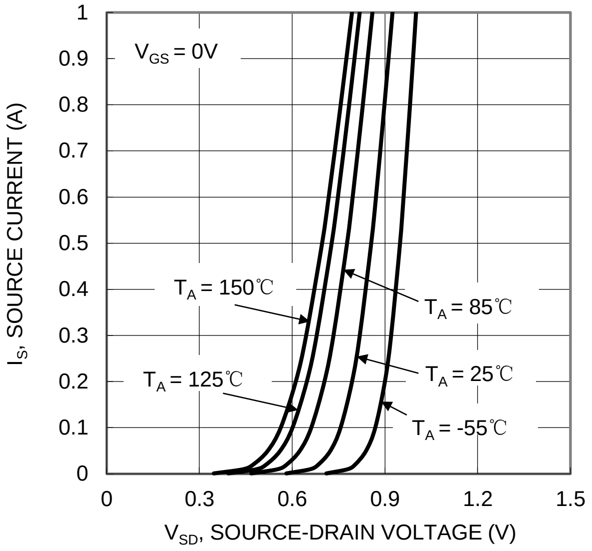


Figure 9. Diode Forward Voltage vs. Current

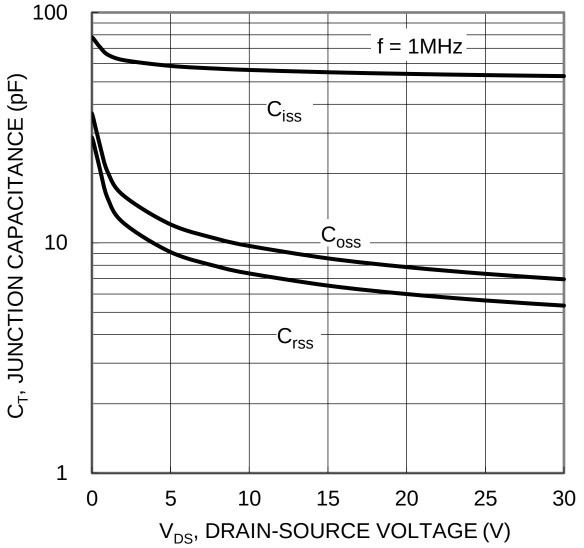


Figure 10. Typical Junction Capacitance

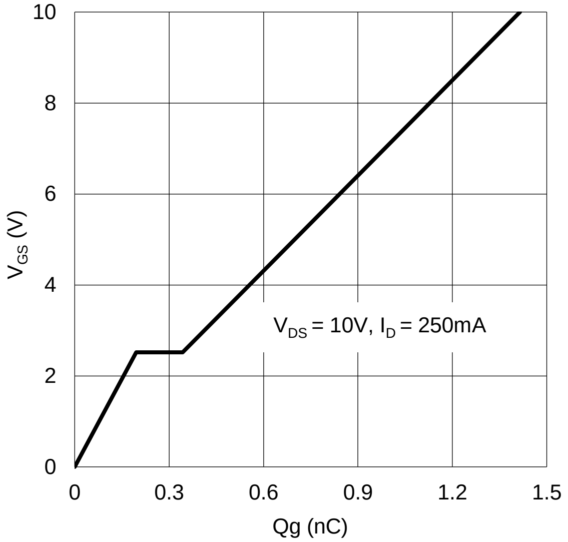


Figure 11. Gate Charge

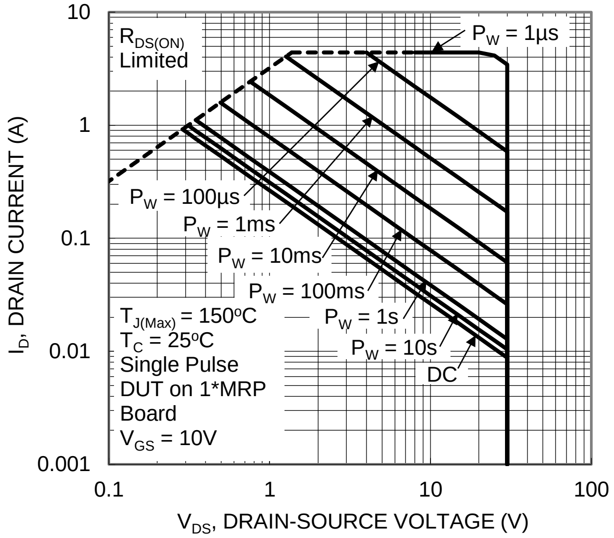


Figure 12. SOA, Safe Operation Area

Typical Characteristics - P-CHANNEL

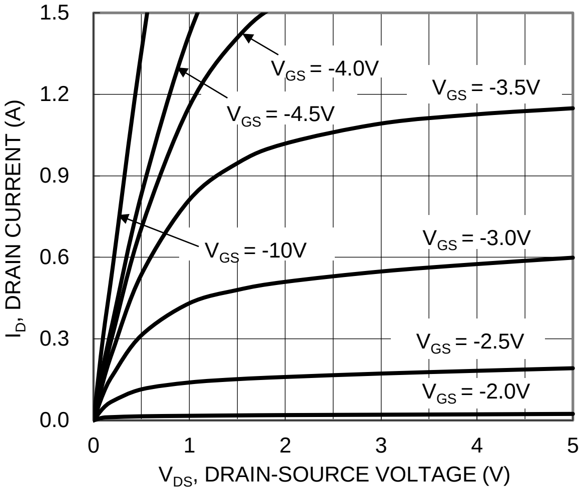


Figure 13. Typical Output Characteristic

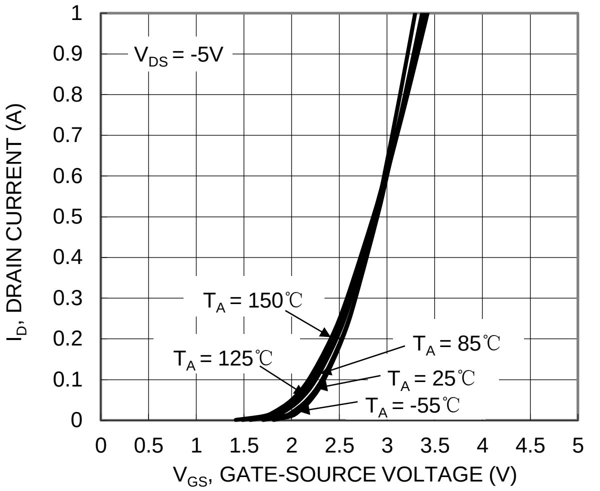


Figure 14. Typical Transfer Characteristic

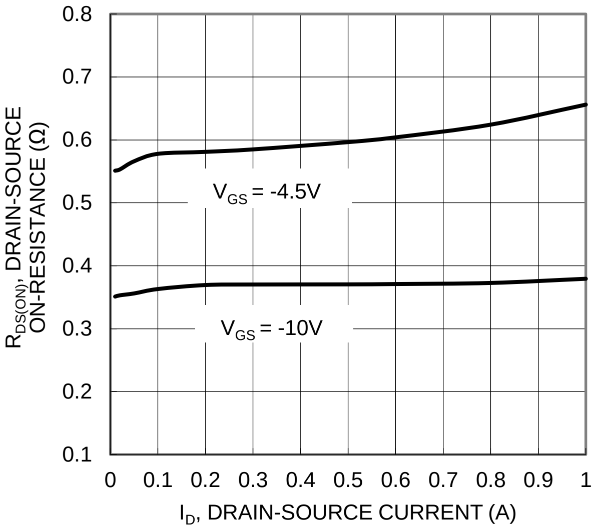


Figure 15. Typical On-Resistance vs. Drain Current and Gate Voltage

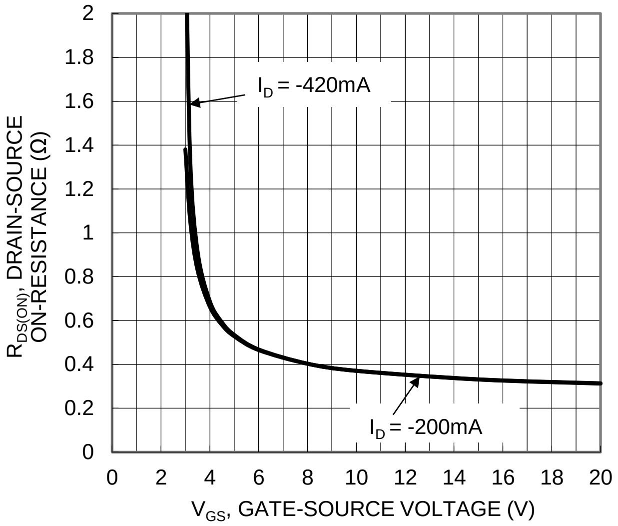


Figure 16. Typical Transfer Characteristic

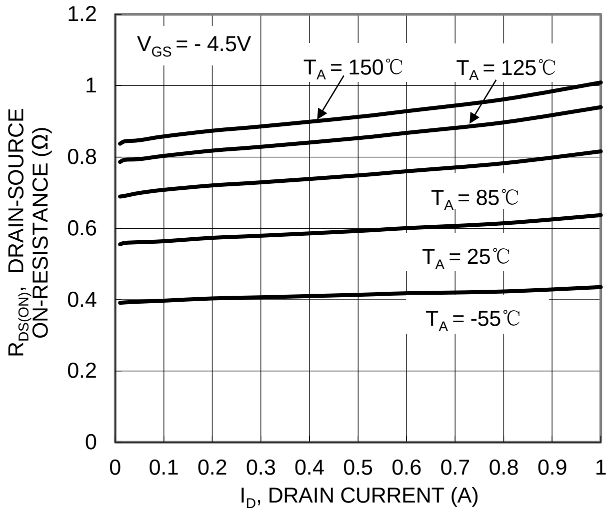


Figure 17. Typical On-Resistance vs. Drain Current and Temperature

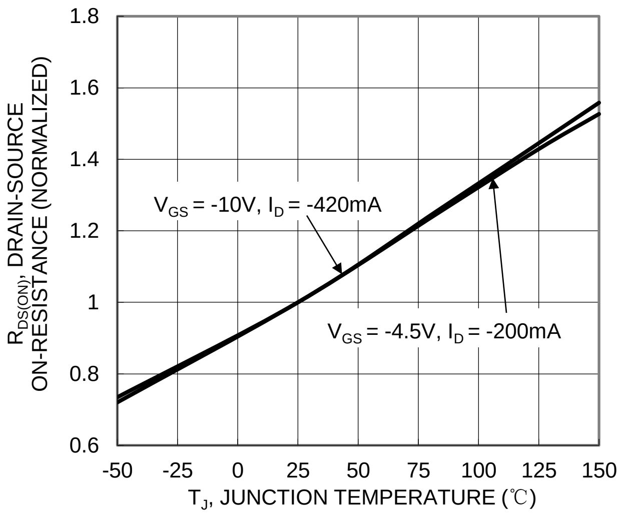


Figure 18. On-Resistance Variation with Temperature

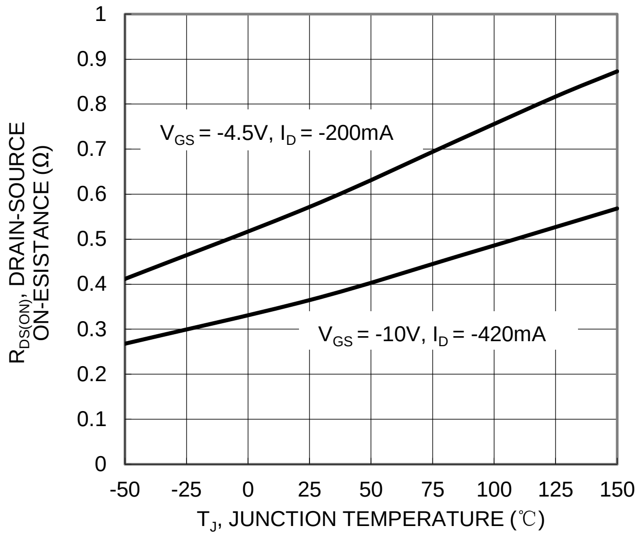


Figure 19. On-Resistance Variation with Temperature

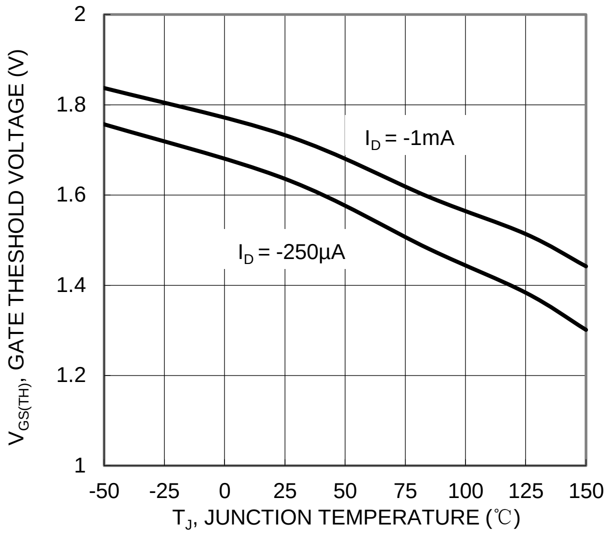


Figure 20. Gate Theshold Variation vs. Junction Temperature

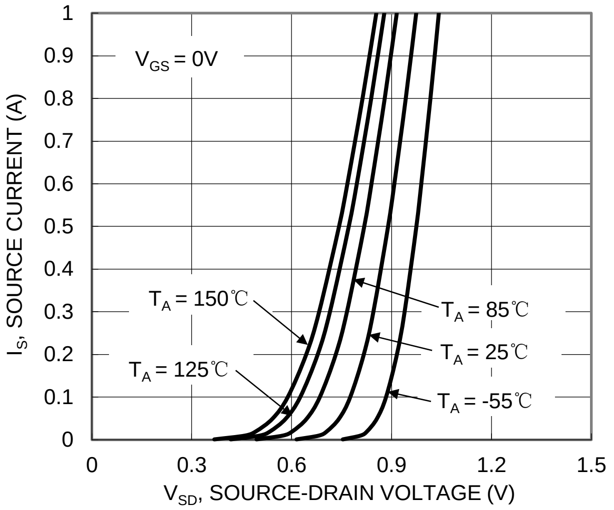


Figure 21. Diode Forward Voltage vs. Current

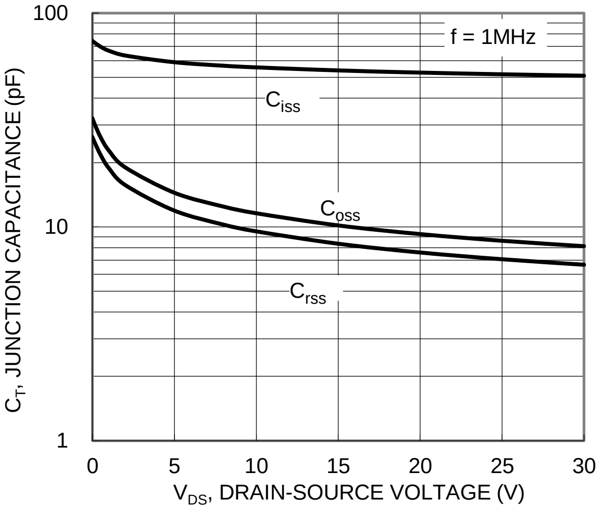


Figure 22. Typical Junction Capacitance

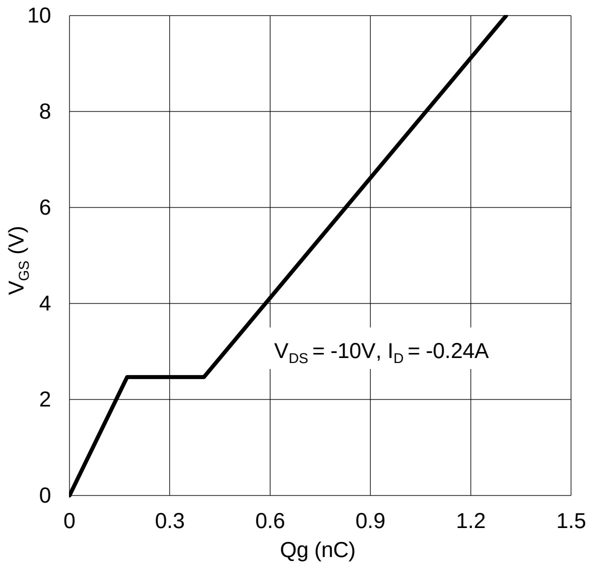


Figure 23. Gate Charge

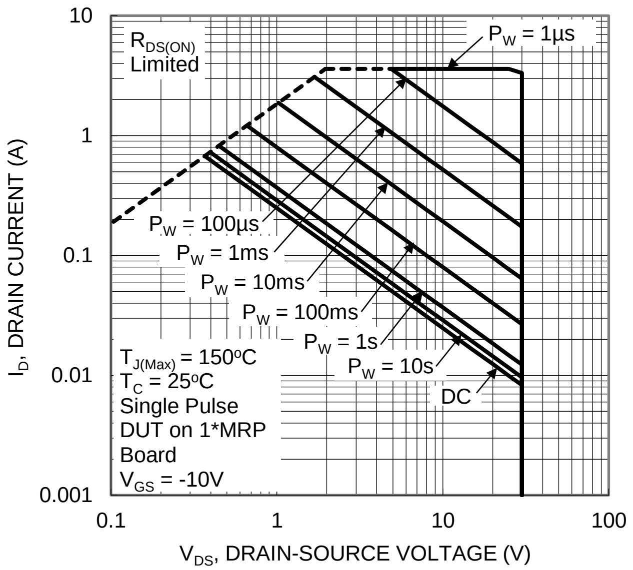


Figure 24. SOA, Safe Operation Area

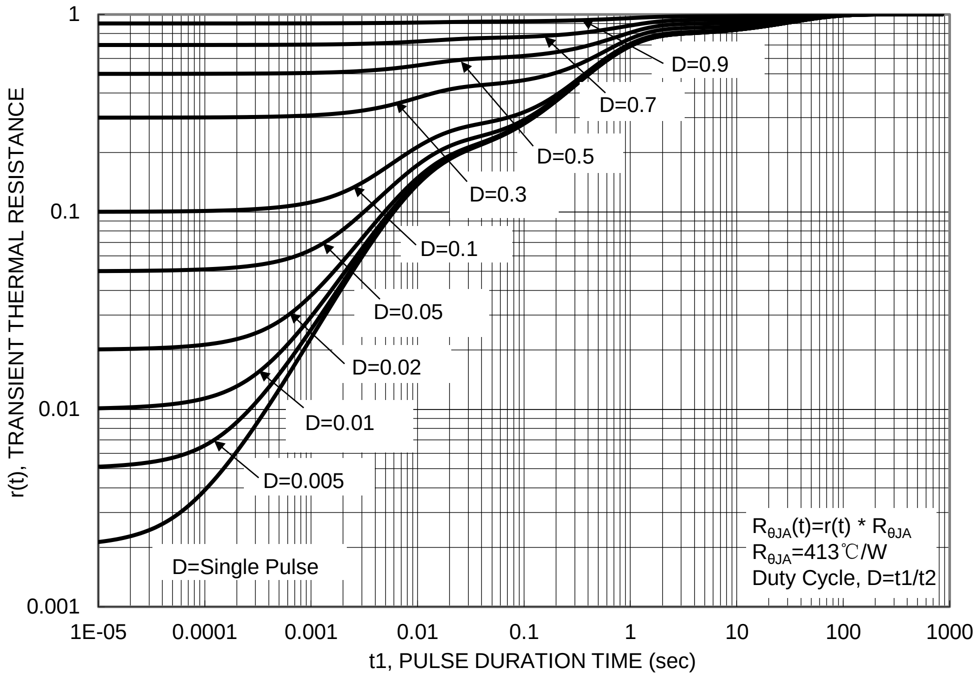
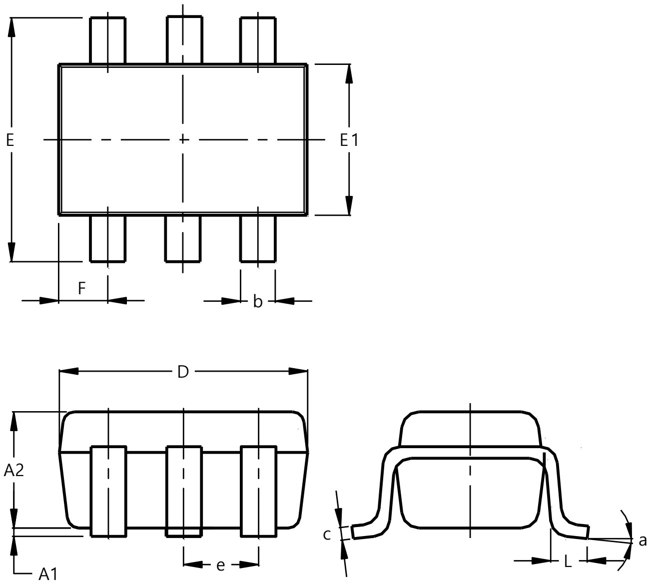


Figure 25. Transient Thermal Resistance

Package Outline Dimensions

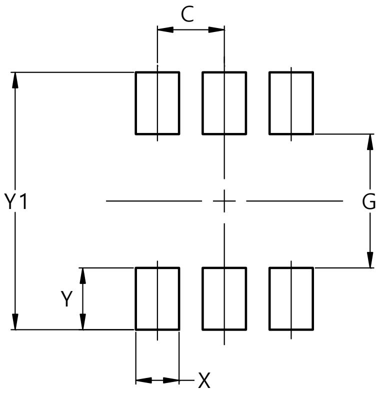
SOT363



SOT363			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

SOT363



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.420
Y	0.600
Y1	2.500