

P-Channel 20-V (D-S) MOSFET

Key Features:

- Low $r_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed

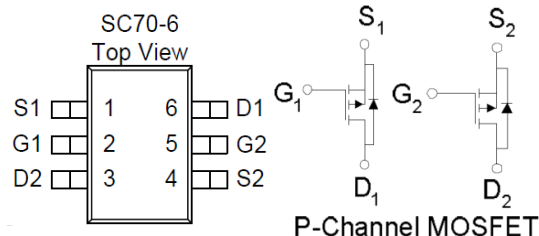
Typical Applications:

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
-20	160 @ $V_{GS} = -4.5V$	-1.2
	210 @ $V_{GS} = -2.5V$	-1.1



RoHS
COMPLIANT
HALOGEN
FREE



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 8	
Continuous Drain Current ^a	I_D	$T_A=25^\circ\text{C}$	-1.2
		$T_A=70^\circ\text{C}$	-1
Pulsed Drain Current ^b	I_{DM}	-3	A
Continuous Source Current (Diode Conduction) ^a	I_S	-0.43	A
Power Dissipation ^a	P_D	$T_A=25^\circ\text{C}$	0.34
		$T_A=70^\circ\text{C}$	0.22
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient ^a	$R_{\theta JA}$	t \leq 10 sec	375
		Steady State	430

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

Electrical Characteristics

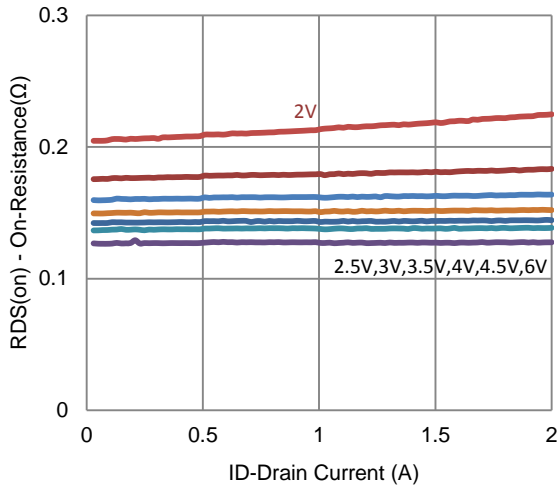
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu A$	-0.4			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 8 V$			± 10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -16 V, V_{GS} = 0 V$			-1	μA
		$V_{DS} = -16 V, V_{GS} = 0 V, T_J = 55^\circ C$			-25	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5 V, V_{GS} = -4.5 V$	-1			A
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = -4.5 V, I_D = -1 A$			160	m Ω
		$V_{GS} = -2.5 V, I_D = -0.8 A$			210	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15 V, I_D = -1 A$		5		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -0.21 A, V_{GS} = 0 V$		-0.7		V
Dynamic ^b						
Total Gate Charge	Q_g	$V_{DS} = -10 V, V_{GS} = -4.5 V,$ $I_D = -1 A$		3.7		nC
Gate-Source Charge	Q_{gs}			0.6		
Gate-Drain Charge	Q_{gd}			0.9		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = -10 V, R_L = 10 \Omega, I_D = -1 A,$ $V_{GEN} = -4.5 V, R_{GEN} = 6 \Omega$		8		ns
Rise Time	t_r			10		
Turn-Off Delay Time	$t_{d(off)}$			26		
Fall Time	t_f			13		
Input Capacitance	C_{iss}	$V_{DS} = -15 V, V_{GS} = 0 V, f = 1 MHz$		216		pF
Output Capacitance	C_{oss}			29		
Reverse Transfer Capacitance	C_{rss}			24		

Notes

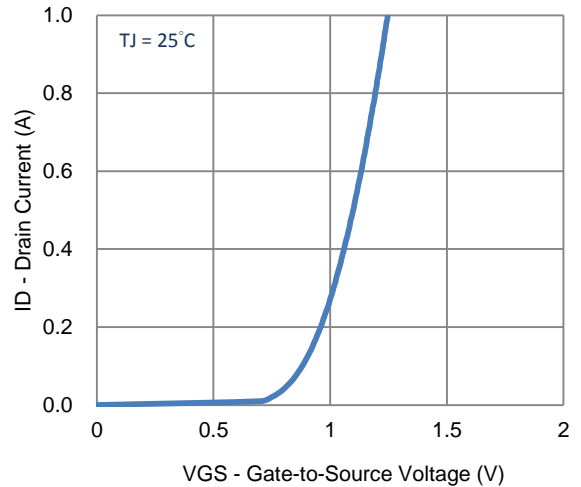
- Pulse test: PW \leq 300us duty cycle \leq 2%.
- Guaranteed by design, not subject to production testing.

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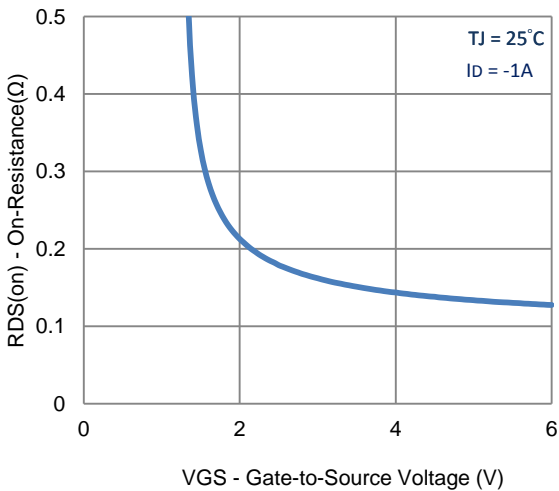
Typical Electrical Characteristics



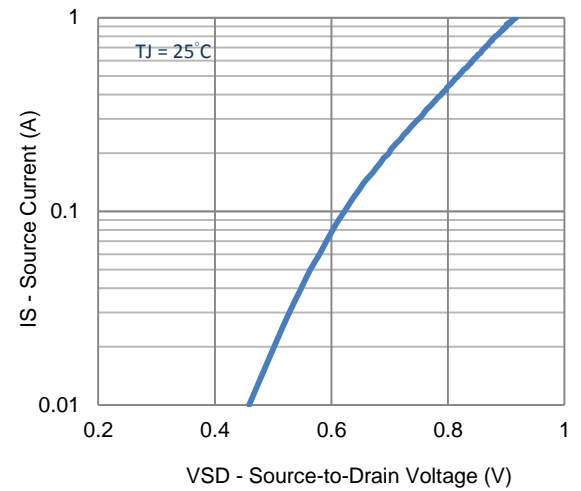
1. On-Resistance vs. Drain Current



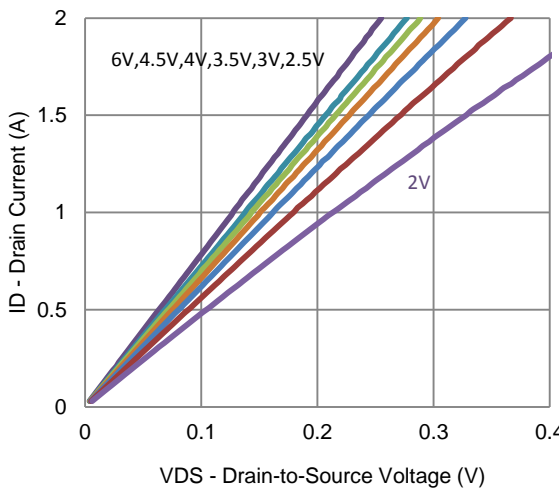
2. Transfer Characteristics



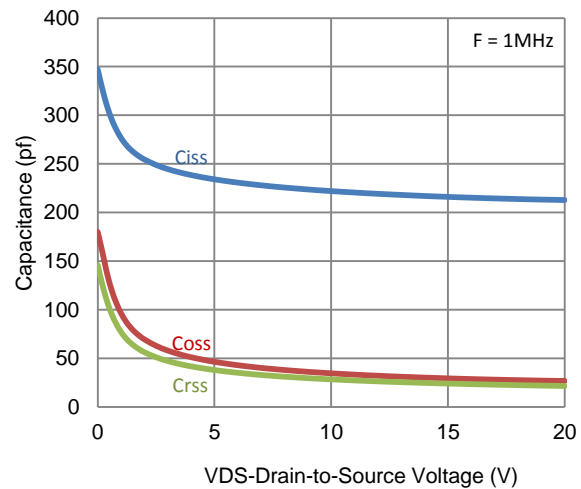
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

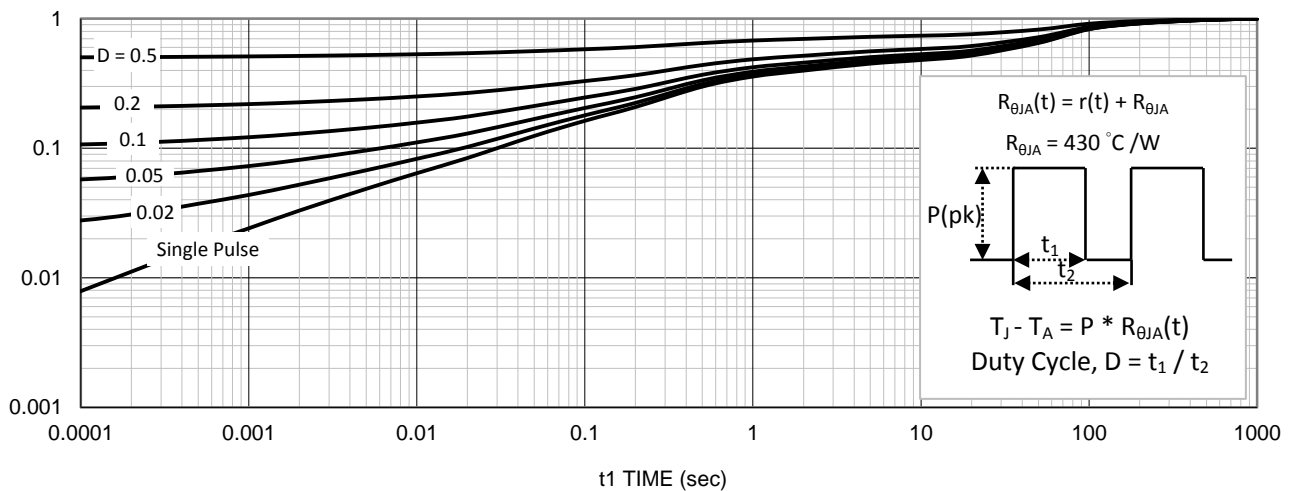
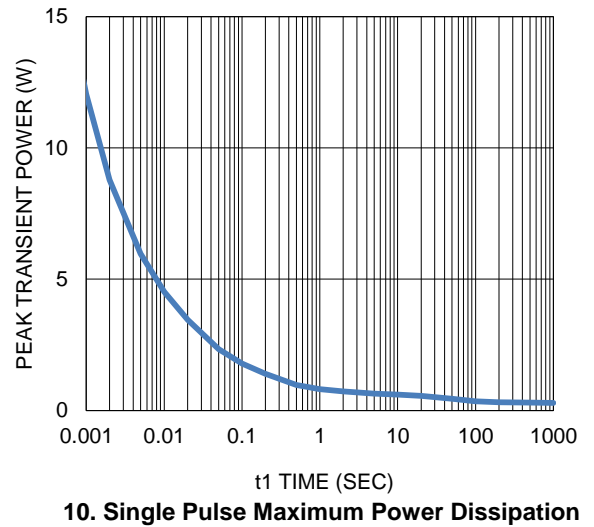
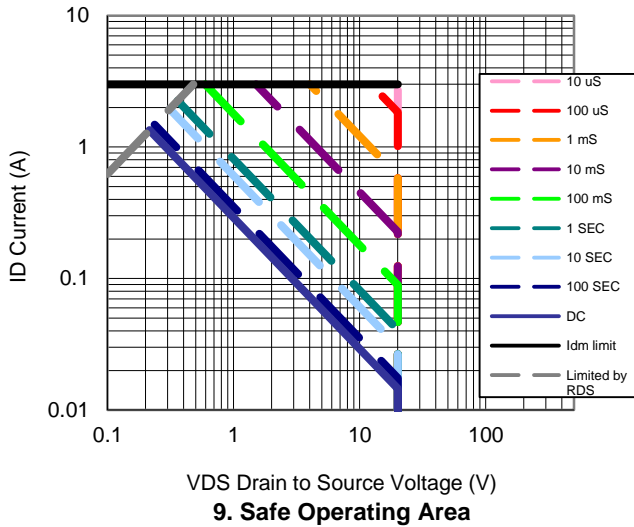
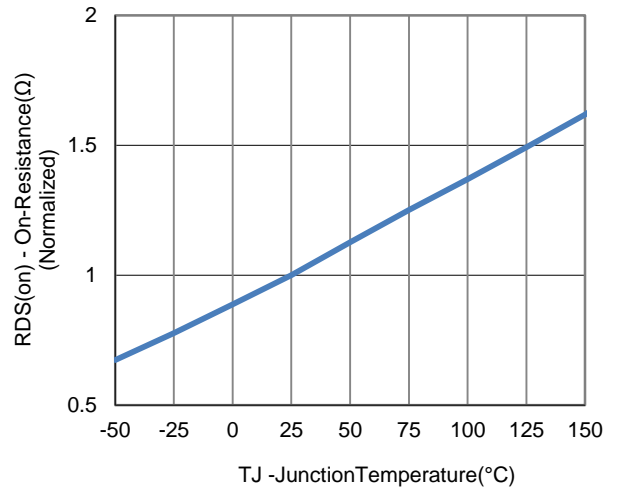
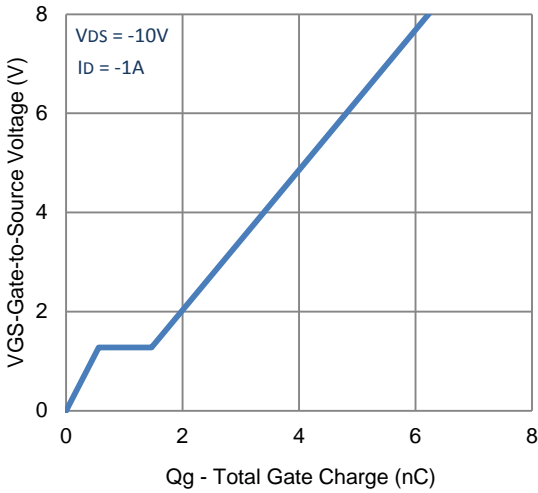


5. Output Characteristics



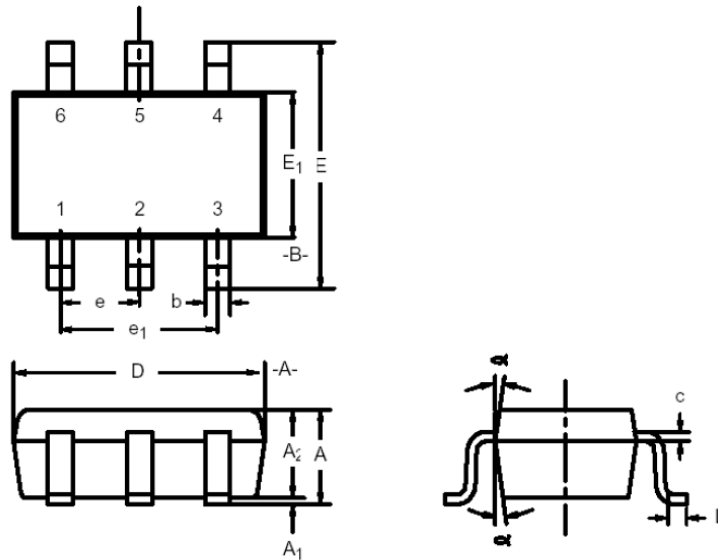
6. Capacitance

Typical Electrical Characteristics



Package Information

SC-70: 6LEAD



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.90	–	1.10	0.035	–	0.043
A₁	–	–	0.10	–	–	0.004
A₂	0.80	–	1.00	0.031	–	0.039
b	0.15	–	0.30	0.006	–	0.012
c	0.10	–	0.25	0.004	–	0.010
D	1.80	2.00	2.20	0.071	0.079	0.087
E	1.80	2.10	2.40	0.071	0.083	0.094
E₁	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65BSC			0.026BSC		
e₁	1.20	1.30	1.40	0.047	0.051	0.055
L	0.10	0.20	0.30	0.004	0.008	0.012
α	7°Nom			7°Nom		