

N-Channel 30-V (D-S) MOSFET

Key Features:

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

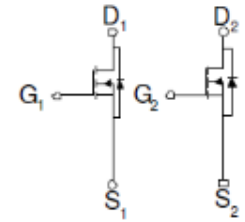
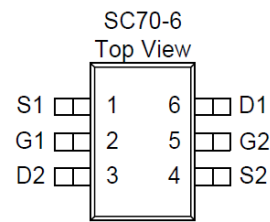
Typical Applications:

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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
30	90 @ $V_{GS} = 10V$	1.5
	130 @ $V_{GS} = 4.5V$	1.3



RoHS
COMPLIANT
HALOGEN
FREE



N-Channel MOSFET



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ^a	$T_A = 25^\circ\text{C}$	I_D	1.5	A
	$T_A = 70^\circ\text{C}$		1.1	
Pulsed Drain Current ^b		I_{DM}	30	
Continuous Source Current (Diode Conduction) ^a		I_S	0.6	A
Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	0.3	W
	$T_A = 70^\circ\text{C}$		0.21	
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	$t \leq 10$ sec	$R_{\theta JA}$	415	$^\circ\text{C/W}$
	Steady State		460	

Notes

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

Electrical Characteristics

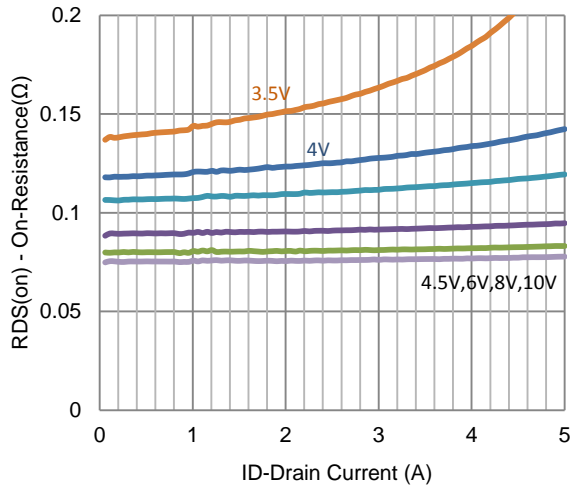
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 24 V, V_{GS} = 0 V$			1	μA
		$V_{DS} = 24 V, V_{GS} = 0 V, T_J = 55^\circ C$			25	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 10 V$	3			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10 V, I_D = 1.5 A$			90	m Ω
		$V_{GS} = 4.5 V, I_D = 1.2 A$			130	
Forward Transconductance	g_{fs}	$V_{DS} = 15 V, I_D = 1.5 A$		5		S
Diode Forward Voltage	V_{SD}	$I_S = 0.3 A, V_{GS} = 0 V$		0.76		V
Dynamic						
Total Gate Charge	Q_g	$V_{DS} = 15 V, V_{GS} = 4.5 V,$ $I_D = 1.5 A$		2		nC
Gate-Source Charge	Q_{gs}			0.5		
Gate-Drain Charge	Q_{gd}			1.1		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 15 V, R_L = 10 \Omega,$ $I_D = 1.5 A,$ $V_{GEN} = 10 V, R_{GEN} = 6 \Omega$		2		ns
Rise Time	t_r			5		
Turn-Off Delay Time	$t_{d(off)}$			12		
Fall Time	t_f			3		
Input Capacitance	C_{iss}	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz$		103		pF
Output Capacitance	C_{oss}			20		
Reverse Transfer Capacitance	C_{rss}			17		

Notes

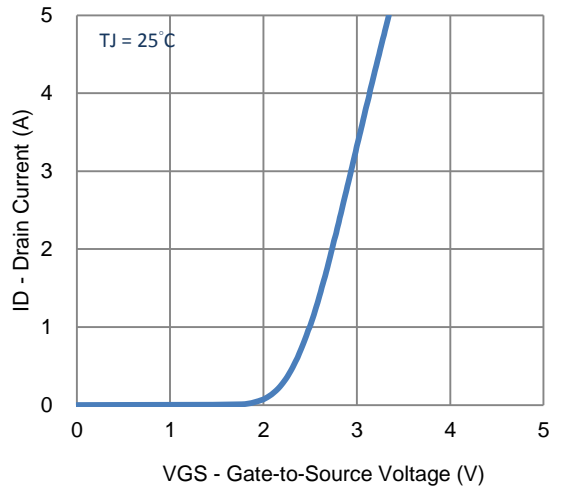
- Pulse test: $PW \leq 300 \mu s$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

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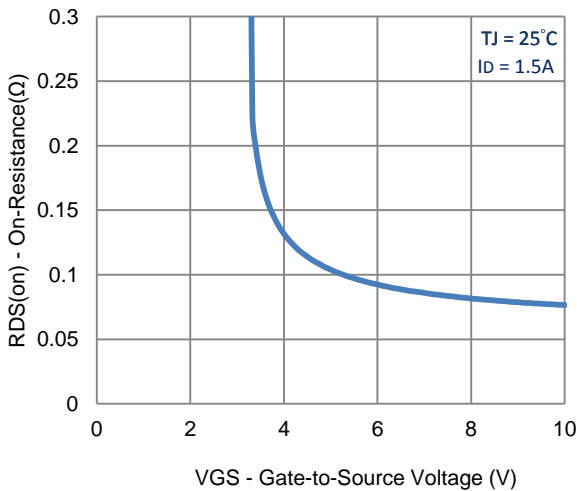
Typical Electrical Characteristics



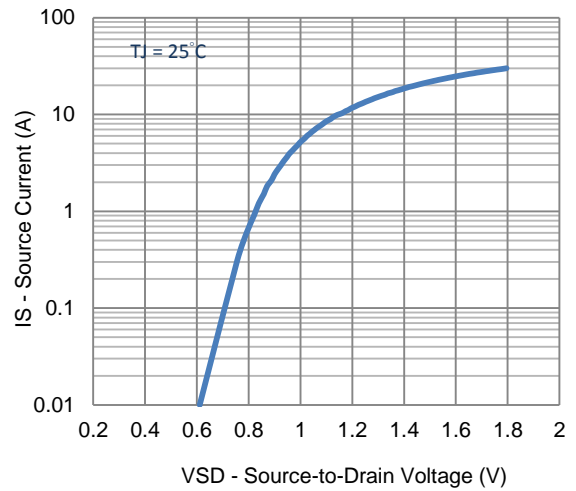
1. On-Resistance vs. Drain Current



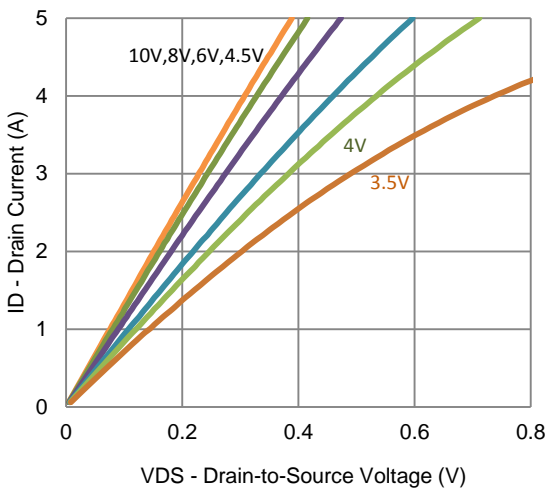
2. Transfer Characteristics



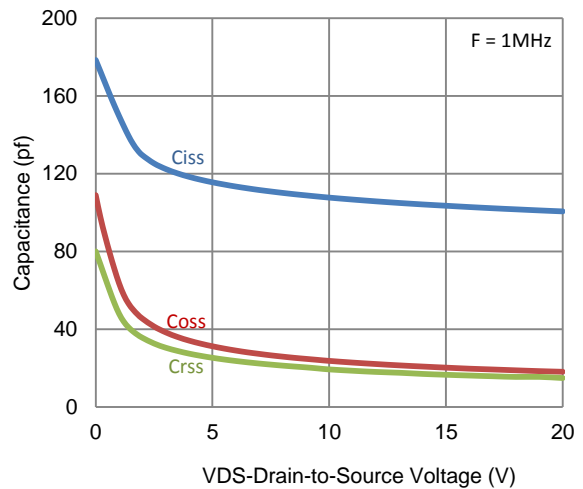
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

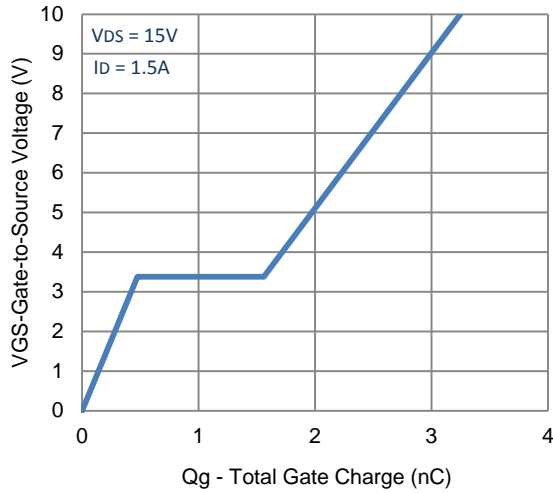


5. Output Characteristics

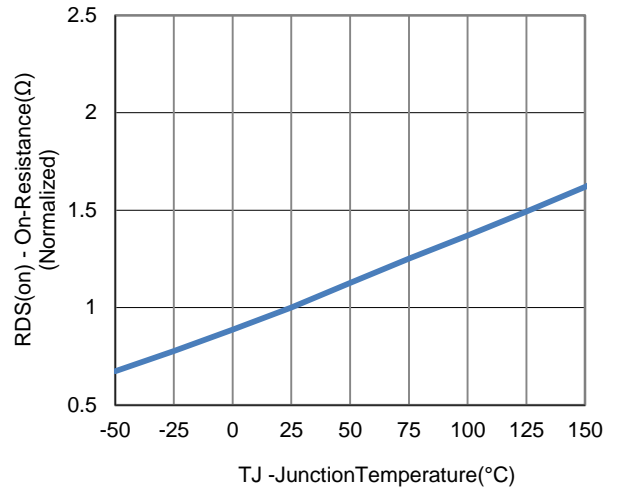


6. Capacitance

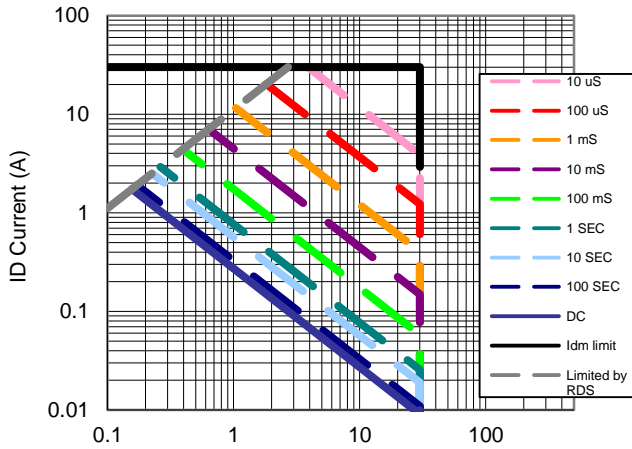
Typical Electrical Characteristics



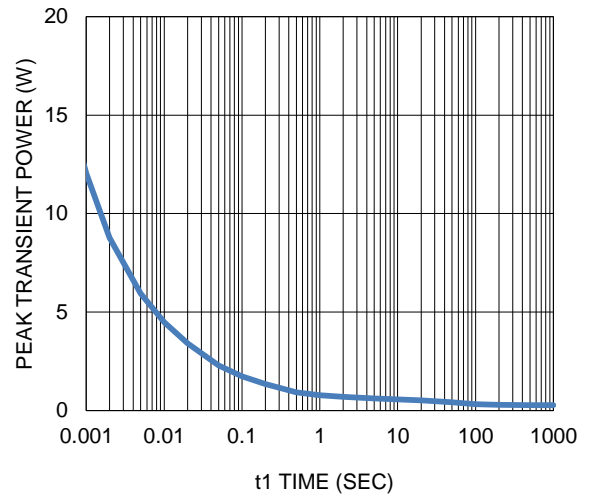
7. Gate Charge



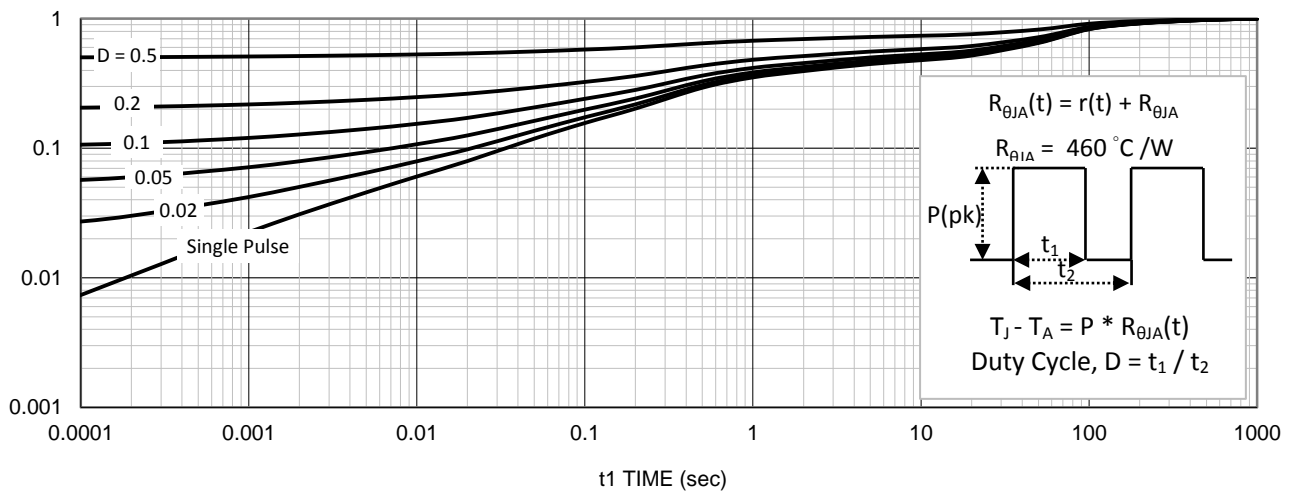
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



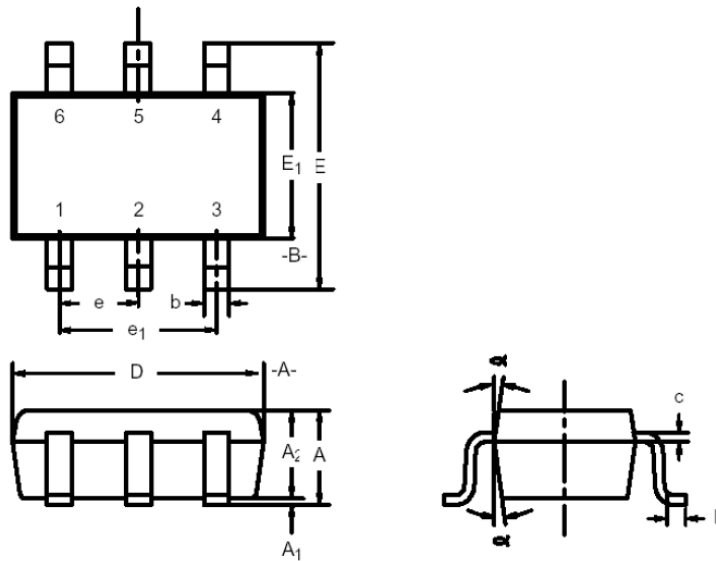
10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information

SC-70: 6LEAD



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.90	–	1.10	0.035	–	0.043
A ₁	–	–	0.10	–	–	0.004
A ₂	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
E ₁	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65BSC			0.026BSC		
e ₁	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		