

MS15C37

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

Features

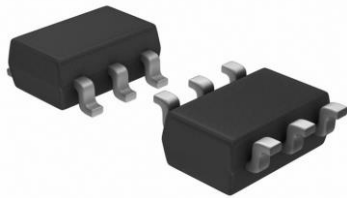
- Low $r_{DS(on)}$ trench technology
- Fast switching speed
- Low thermal impedance
- RoHS compliant package

Applications

- DC/DC Conversion
- Power Routing
- Motor Drives

Packing & Order Information

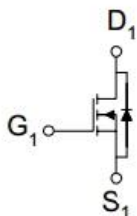
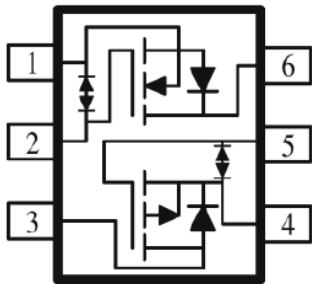
3,000/Reel



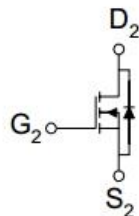
RoHS
COMPLIANT

Graphic symbol

SC70-6

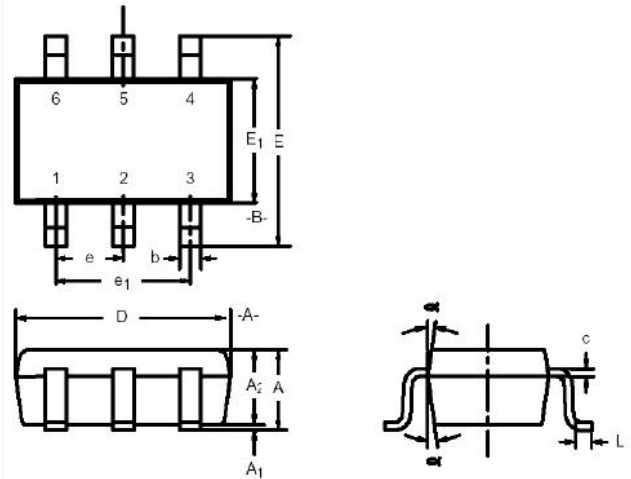


N-Channel MOSFET



N-Channel MOSFET

SC-70: 6



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		

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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (Tc=25°C unless otherwise specified)

Symbol	Parameter	Nch Limit	Pch Limit	Unit
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
I_D	Continuous Drain Current ^a ($T_A = 25^\circ\text{C}$)	1.5	1.0	A
	Continuous Drain Current ^a ($T_A = 70^\circ\text{C}$)	1.25	0.86	A
I_{DM}	Pulsed Drain Current ^b	10	-10	A
I_S	Continuous Source Current (Diode Conduction) ^a	0.36	-0.35	A
P_D	Power Dissipation ^a ($T_A = 25^\circ\text{C}$)	0.3	0.3	W
	Power Dissipation ^a ($T_A = 70^\circ\text{C}$)	0.21	0.21	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to 150		$^\circ\text{C}$

Thermal Resistance Ratings

Symbol	Parameter	Maximum	Units
R_{THJA}	Maximum Junction-to-Ambient C/W ^a ($t \leq 10$ sec)	415	$^\circ\text{C/W}$
	Maximum Junction-to-Ambient C/W ^a (Steady-State)	460	

Notes:

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

Static

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = -250 \mu\text{A}$ (Nch) $V_{DS} = V_{GS}$, $I_D = -250 \mu\text{A}$ (Pch)	1 -1			V
I_{GSS}	Gate-Body Leakage	$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 20 \text{ V}$ (Pch)			± 10	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 24 \text{ V}$, $V_{GS} = 0 \text{ V}$ (Nch) $V_{DS} = -24 \text{ V}$, $V_{GS} = 0 \text{ V}$ (Pch)			1 -1	μA
$I_{D(on)}$	On-State Drain Current ^A	$V_{DS} = 5 \text{ V}$, $V_{GS} = 10 \text{ V}$ (Nch) $V_{DS} = -5 \text{ V}$, $V_{GS} = -10 \text{ V}$ (Pch)	1.8 1.2			A
$R_{DS(on)}$	Drain-Source On-Resistance ^A	$V_{GS} = 10 \text{ V}$, $I_D = 1.1 \text{ A}$ (Nch) $V_{GS} = 4.5 \text{ V}$, $I_D = 0.88 \text{ A}$ (Pch) $V_{GS} = -10 \text{ V}$, $I_D = -0.8 \text{ A}$ (Nch) $V_{GS} = -4.5 \text{ V}$, $I_D = -0.64 \text{ A}$ (Pch)			90 130 190 290	$\text{m}\Omega$
g_{fs}	Forward Transconductance ^A	$V_{DS} = 15 \text{ V}$, $I_D = 1.1 \text{ A}$ (Nch) $V_{DS} = -15 \text{ V}$, $I_D = -0.8 \text{ A}$ (Pch)		4 3		S
V_{SD}	Diode Forward Voltage	$I_S = 0.18 \text{ V}$, $V_{GS} = 0 \text{ V}$ (Nch) $I_S = 0.175 \text{ V}$, $V_{GS} = 0 \text{ V}$ (Pch)		0.74 -0.79		V

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Dynamic ^b						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	N-Channel $V_{DS} = 15\text{ V}$, $I_D = 1.2\text{ A}$, $V_{GS} = 4.5\text{ V}$	--	0.9	--	nC
Q_{gs}	Gate-Source Charge		--	0.32	--	nC
Q_{gd}	Gate-Drain Charge		--	0.30	--	nC
$t_{d(on)}$	Turn-On Delay Time	N-Channel $V_{DS} = 15\text{ V}$, $R_L = 12.5\ \Omega$, $V_{GEN} = 10\text{ V}$, $R_{GEN} = 6\ \Omega$, $I_D = 2\text{ A}$	--	2	--	ns
t_r	Rise Time		--	7	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	13	--	ns
t_f	Fall Time		--	4	--	ns
C_{iss}	Input Capacitance	N-Channel $V_{DS} = 15\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ Mhz}$	--	118	--	pF
C_{oss}	Output Capacitance		--	20	--	pF
C_{rss}	Reverse Transfer Capacitance		--	16	--	pF
Q_g	Total Gate Charge	P-Channel $V_{DS} = -15\text{ V}$, $I_D = -0.8\text{ A}$, $V_{GS} = -4.5\text{ V}$	--	2.3	--	nC
Q_{gs}	Gate-Source Charge		--	0.64	--	nC
Q_{gd}	Gate-Drain Charge		--	0.75	--	nC
$t_{d(on)}$	Turn-On Delay Time	P-Channel $V_{DS} = -15\text{ V}$, $R_L = 18.7\ \Omega$, $V_{GEN} = 10\text{ V}$, $R_{GEN} = 6\ \Omega$, $I_D = -0.8\text{ A}$	--	5	--	ns
t_r	Rise Time		--	7	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	13	--	ns
t_f	Fall Time		--	5	--	ns
C_{iss}	Input Capacitance	P-Channel $V_{DS} = -15\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ Mhz}$	--	132	--	pF
C_{oss}	Output Capacitance		--	23	--	pF
C_{rss}	Reverse Transfer Capacitance		--	18	--	pF

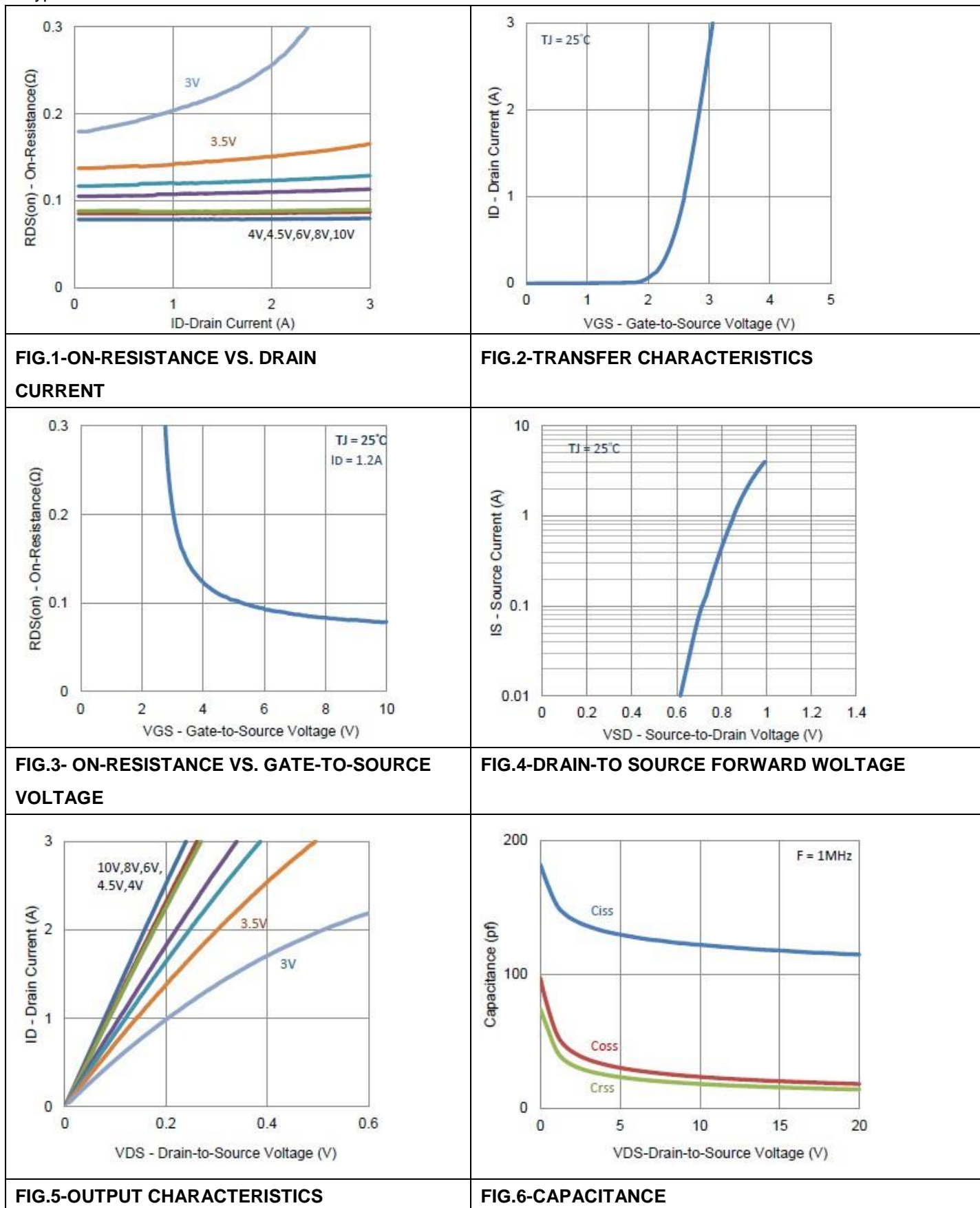
Notes:

- Pulse test: $PW \leq 300\mu s$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Repetitive rating, pulse width limited by junction temperature.

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Typical Electrical Characteristics - N-channel



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■ Typical Electrical Characteristics - N-channel

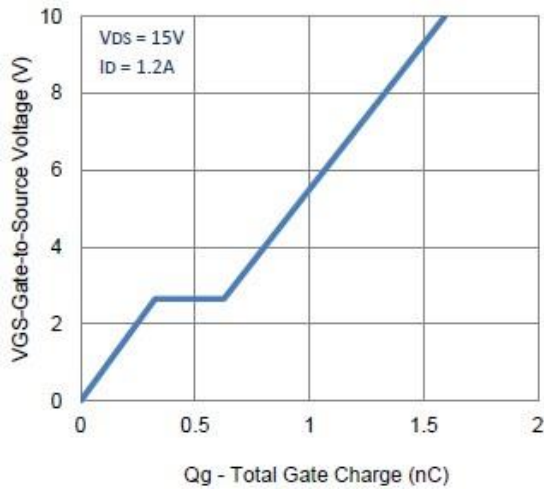


FIG.7-GATE CHARGE

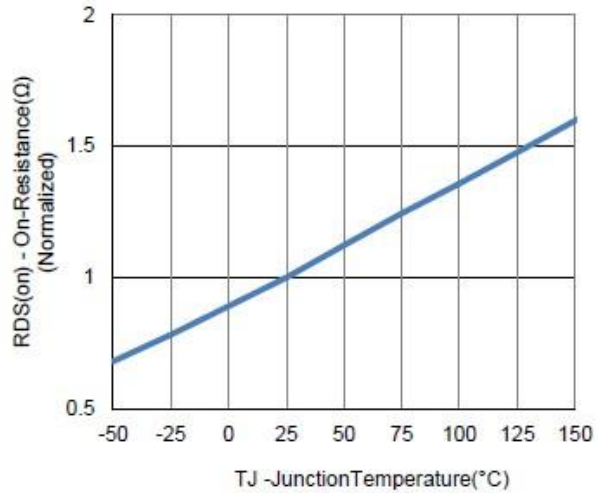


FIG.8-NORMALIZED ON-RESISTANCE VS JUNCTION TEMPERATURE

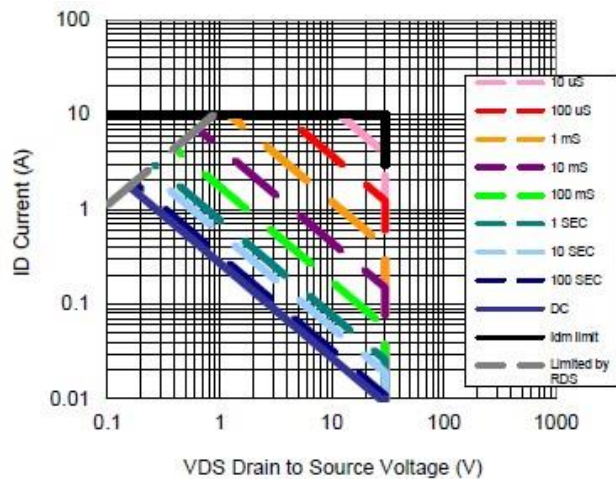


FIG.9-SAFE OPERATING AREA

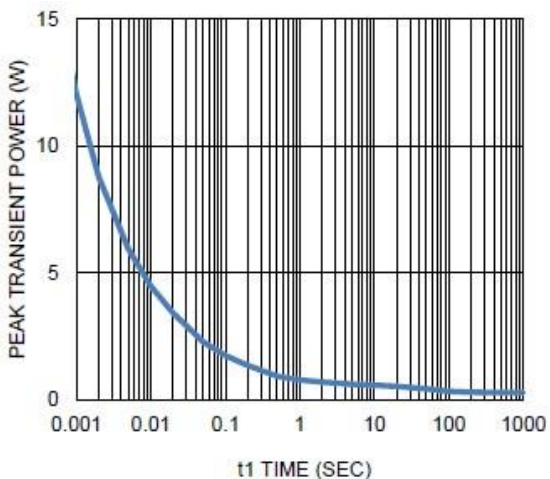


FIG.10-SINGLE PULSE MAXIMUM POWER DISSIPATION

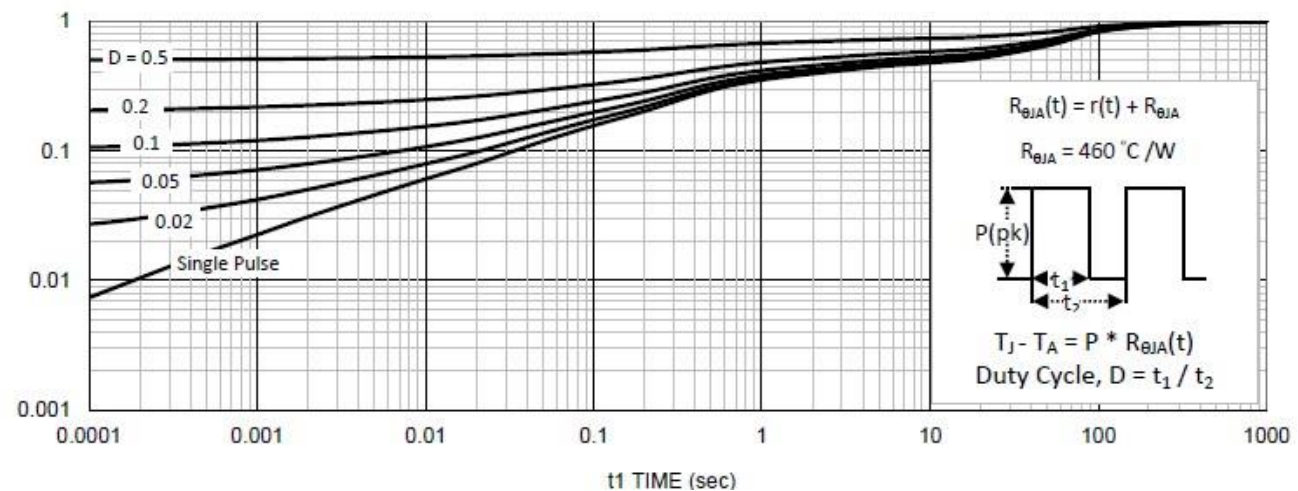


FIG.11-NORMALIZED THERMAL TRANSIENT JUNCTION TO AMBIENT

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■ Typical Electrical Characteristics - P-channel

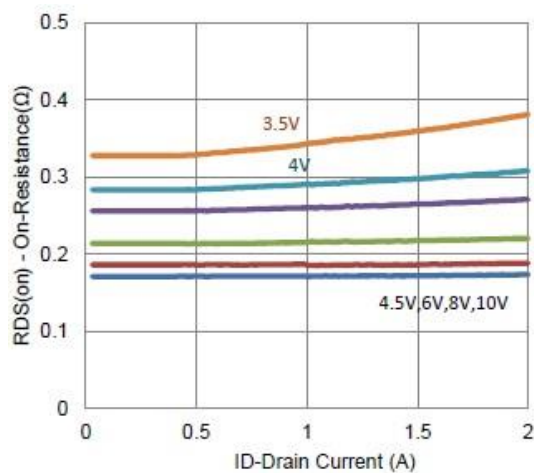


FIG.1-ON-RESISTANCE VS. DRAIN CURRENT

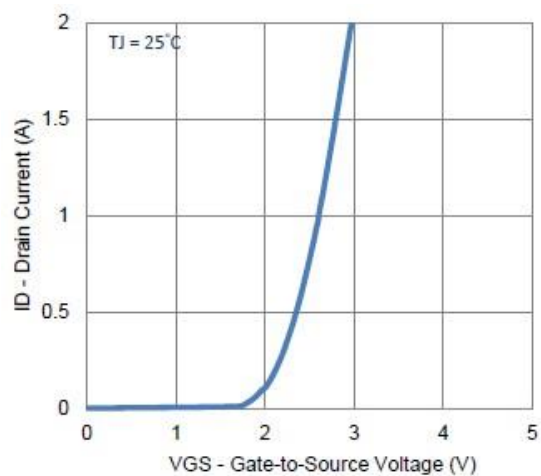


FIG.2-TRANSFER CHARACTERISTICS

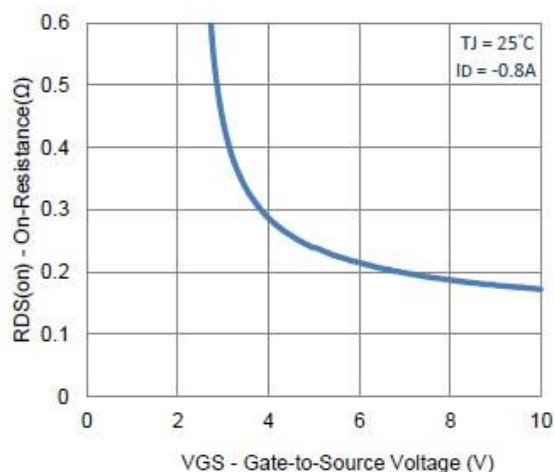


FIG.3- ON-RESISTANCE VS. GATE-TO-SOURCE VOLTAGE

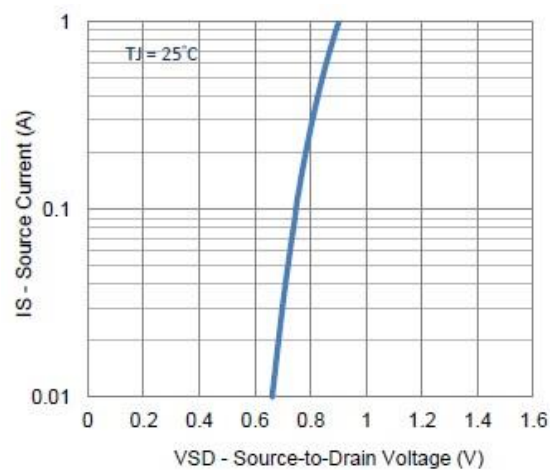


FIG.4-DRAIN-TO SOURCE FORWARD WOLTAGE

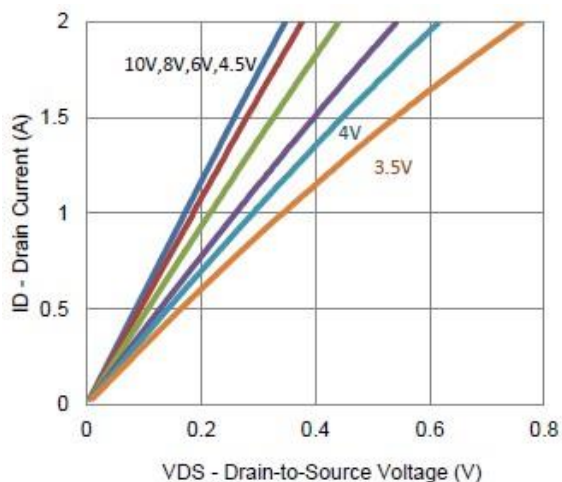


FIG.5-OUTPUT CHARACTERISTICS

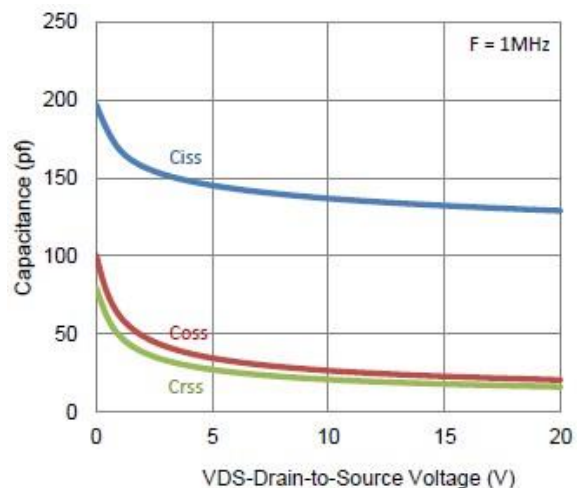


FIG.6-CAPACITANCE

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■ Typical Electrical Characteristics - P-channel

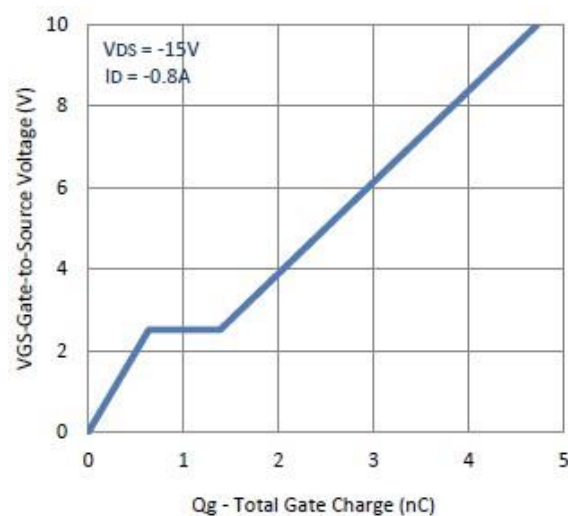


FIG.7-GATE CHARGE

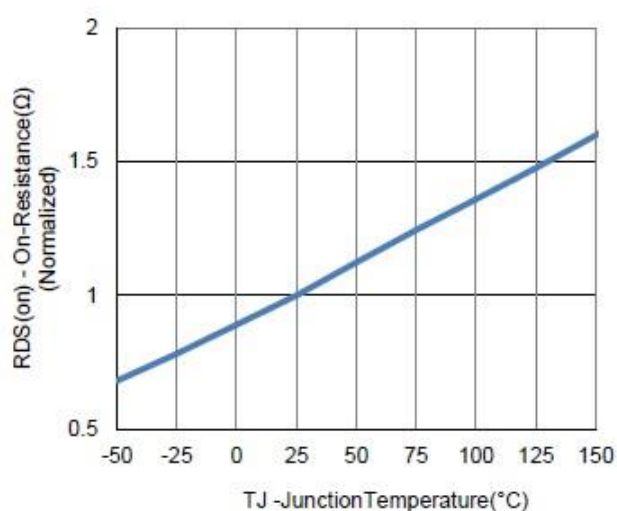


FIG.8-NORMALIZED ON-RESISTANCE VS JUNCTION TEMPERATURE

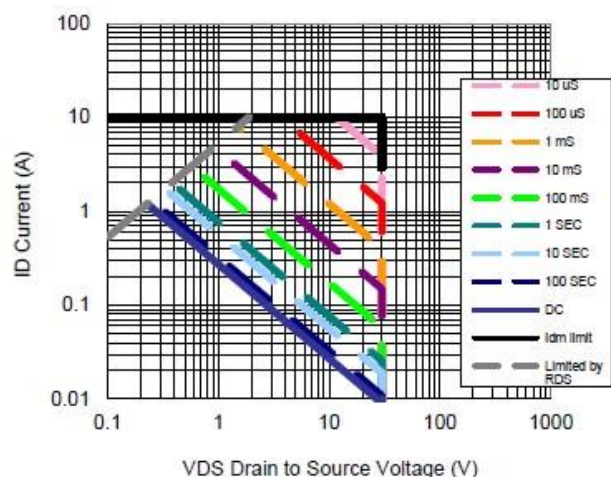


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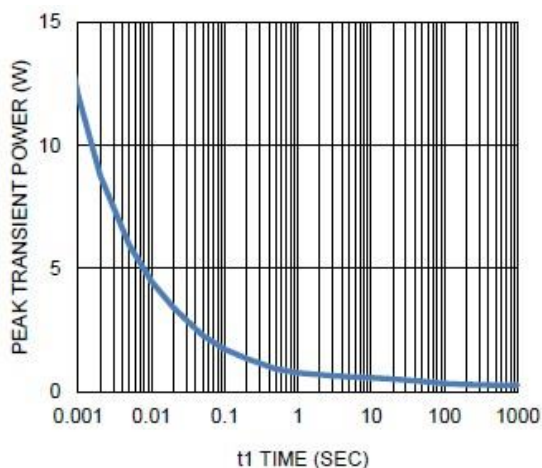


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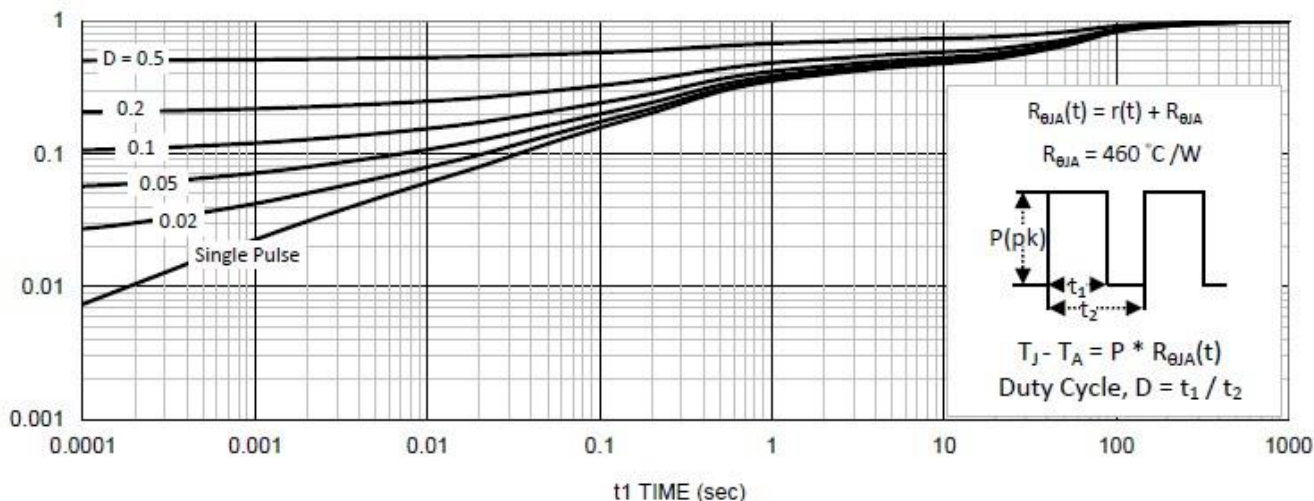


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