

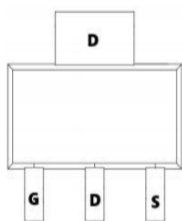
Product Summary

- V_{DS} -220 V
- I_{DS} -0.26 A
- $R_{DS(ON)}$ (at $V_{GS}=-10V$) $<12\Omega$

Application

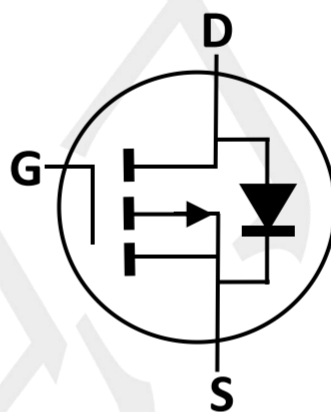
- Solid-State Relays
- Portable equipment and battery
- Telecommunication Switches

Package and Pin Configuration



SOT89-3

Circuit diagram



Equivalent Circuit

Marking:P52

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	-220	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C=25^\circ\text{C}$	I_D	-0.26	A
	$T_C=70^\circ\text{C}$		-0.18	
Pulsed Drain Current		I_{DM}	-1	A
Total Power Dissipation		P_{DTOT}	1	W
Operating Junction Temperature Range		T_J	-55 to +150	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55 to +150	$^\circ\text{C}$

Thermal Characteristic

PARAMETER		Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance	PCB Mount (Note)	R_{thJA}	125	$^\circ\text{C/W}$

Note : When mounted on 1" square PCB (FR4 material).

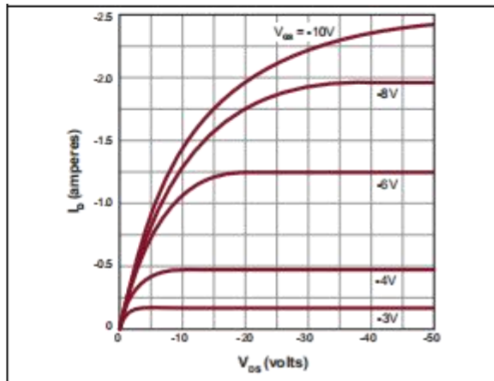
Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-2mA$	BV_{DSS}	-220	--	--	V
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=-1mA$	$V_{GS(th)}$	-1	-1.5	-2.5	V
Gate-Source Leakage	$V_{DS}=0V, V_{GS}= \pm 20V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS}= -220V, V_{GS}=0V$	I_{DSS}	--	--	-1	μA
	$V_{DS}= -220V, T_J=125^{\circ}C$		--	--	-800	μA
Drain-Source On-State Resistance (Note 1)	$V_{GS}= -10V, I_D= -0.2A$	$R_{DS(on)}$	--	8	12	Ω
	$V_{GS}= -4.5V, I_D= -0.1A$		--	10	15	
Forward Transconductance (Note 2)	$V_{DS}= -10V, I_D= -0.1A$	g_{fs}	--	1.5	--	S
Dynamic (Note 2)						
Total Gate Charge (Note 3)	$V_{DS}= -25V,$ $I_D= -0.26A,$ $V_{GS}= -10V$	Q_g	--	4.9	--	nC
Gate-Source Charge (Note 3)		Q_{gs}	--	0.7	--	
Gate-Drain Charge (Note 3)		Q_{gd}	--	0.8	--	
Input Capacitance	$V_{DS}= -25V, V_{GS}= 0V,$ $F= 1.0MHz$	C_{iss}	--	75	--	pF
Output Capacitance		C_{oss}	--	20	--	
Reverse Transfer Capacitance		C_{rss}	--	10	--	
Switching						
Turn-On Delay Time (Note 3)	$V_{DD}= -25V,$ $I_D= -0.2A,$ $V_{GS}= -10V,$ $R_{GEN}= 2\Omega$	$t_{d(on)}$	--	10	--	nS
Rise Time (Note 3)		t_r	--	15	--	
Turn-Off Delay Time (Note 3)		$t_{d(off)}$	--	72	--	
Fall Time (Note 3)		t_f	--	50	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	$V_{GS}= 0V, I_F= -0.2A$	V_{SD}	--	-0.78	-1.2	V
Continuous Source Current	Integral reverse diode in the MOSFET	I_S	--	--	-0.26	A
Pulsed Current (Note 1)		I_{SM}	--	--	-0.78	A

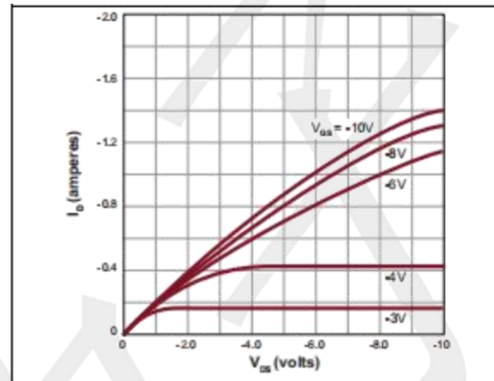
Notes:

1. Pulse test; pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

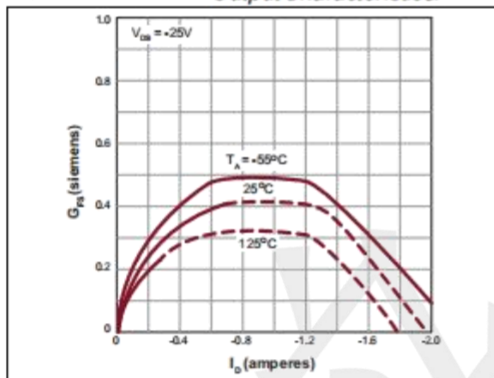
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



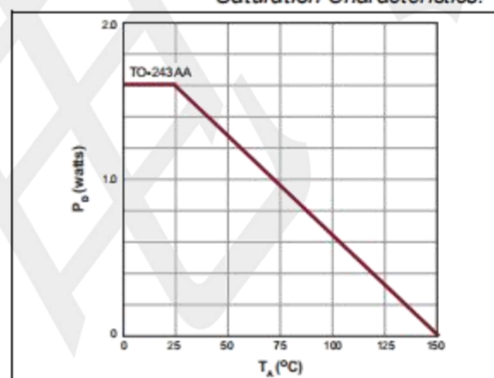
Output Characteristics.



Saturation Characteristics.



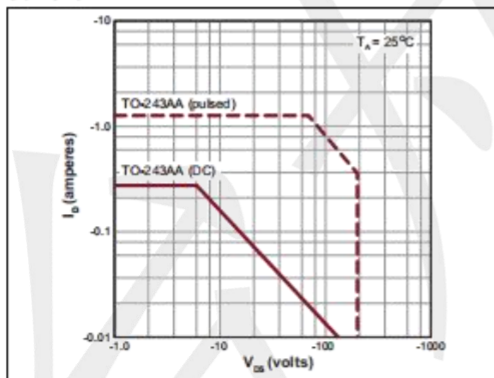
Transconductance vs. Drain



Power Dissipation vs.

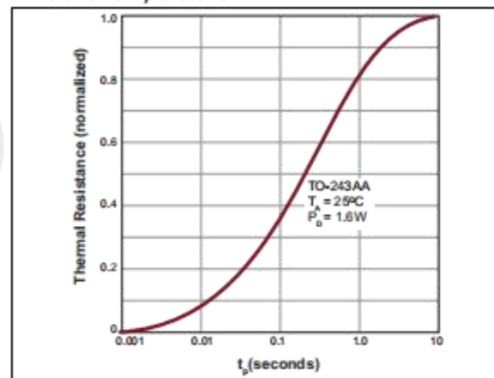
Current.

Ambient Temperature.



Maximum Rated Safe

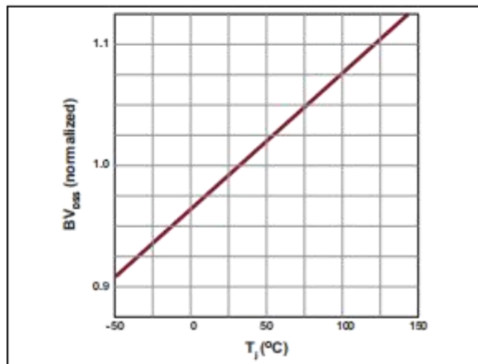
Operating Area.



Thermal Response

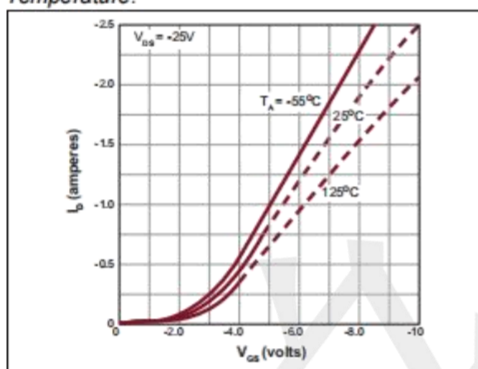
Characteristics.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

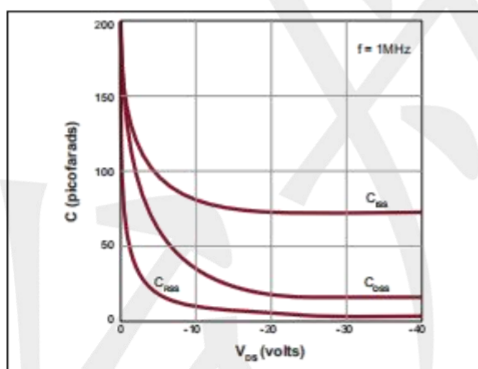


BV_{DSS} Variation with

Temperature.

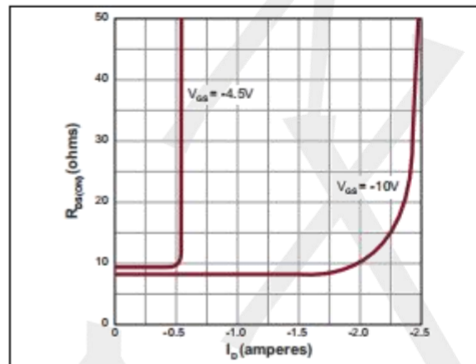


Transfer Characteristics.



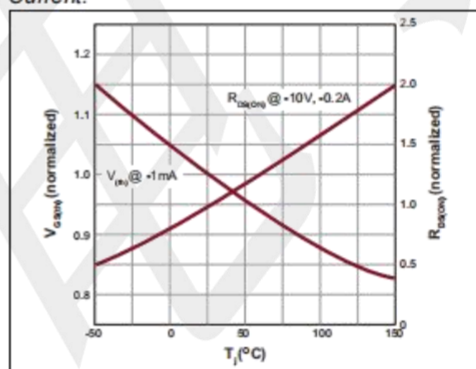
Capacitance vs.

Drain-to-Source Voltage.



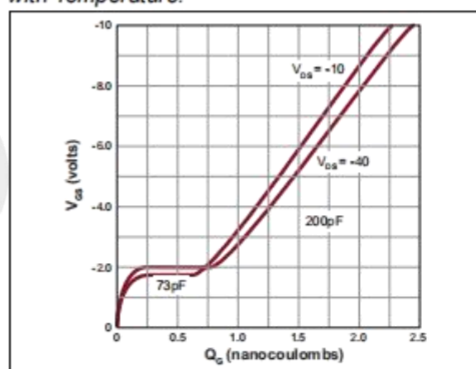
On-Resistance vs. Drain

Current.



V_{GS(th)} and R_{DS} Variation

with Temperature.

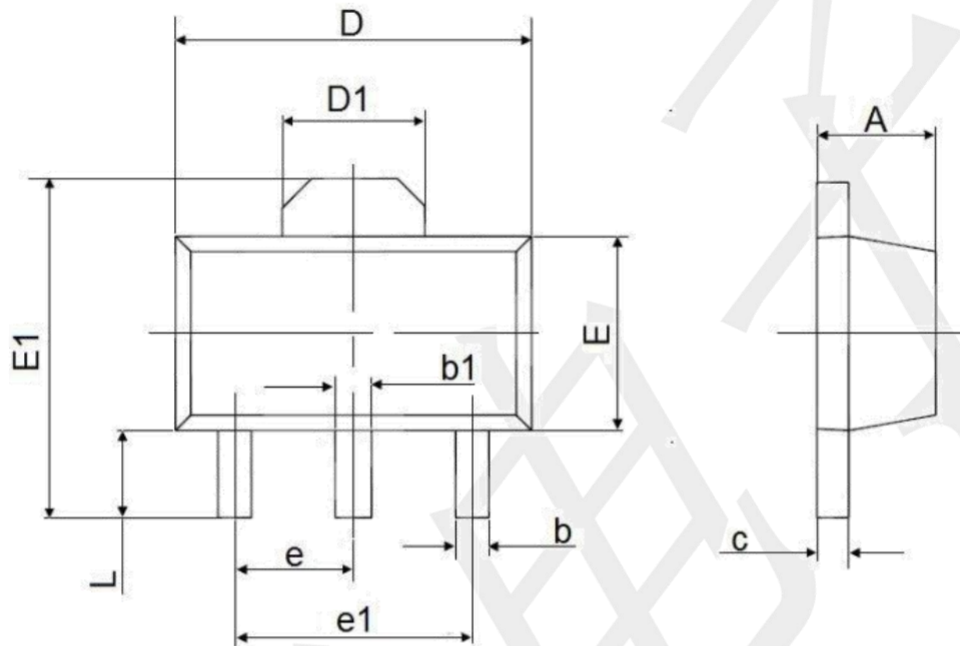


Gate Drive Dynamic

Characteristics.

* The power dissipation PD is based on T_{J(max)} = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

Package Information - SOT89-3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047