

P Channel MOSFET AEC-Q101

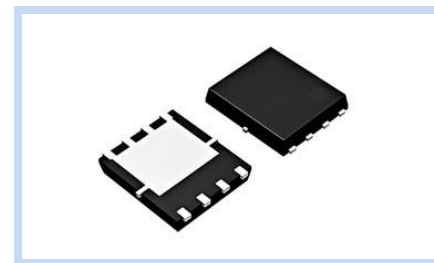
30V 55A 62W DFN5×6-8

MFT3P55D56A

MERITEK

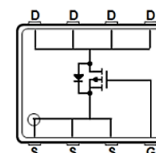
FEATURES

- $R_{DS(ON)} < 10.5m\Omega$ at $V_{GS}=10V$
- $R_{DS(ON)} < 20m\Omega$ at $V_{GS}=4.5V$
- High Density Cell Design Enables Low Conduction Loss
- High-Speed Switching and High Current Capability
- AEC-Q101 Compliant



APPLICATIONS

- Automotive Power Management in Power Distribution and Battery Rail Control
- Reverse Polarity and Load Disconnect in Battery Protection Circuits
- High-Side Switching in 12V / 24V Load Switching Systems
- Automotive-grade Reliability Supports Harsh Operating Environment

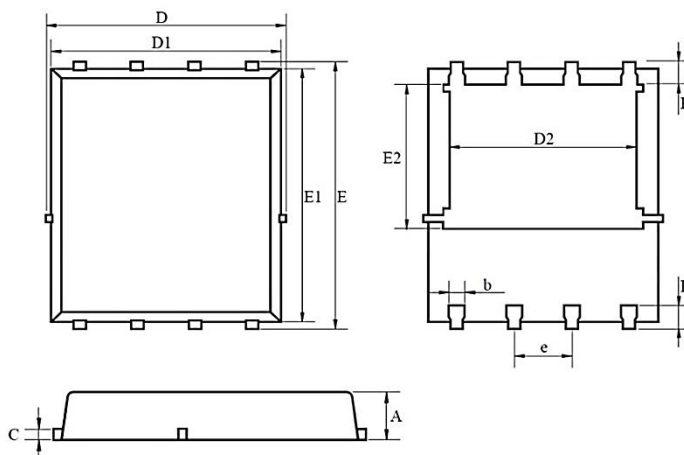


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 25	V
Drain Current – Continuous	$T_C=25^{\circ}C$	I_D	-55	A
	$T_C=100^{\circ}C$		-35	
Drain Current – Pulsed		I_{DM}	-150	A
Power Dissipation	$T_C=25^{\circ}C$	P_D	62	W
Single Pulse Avalanche Energy		E_{AS}	100	mJ
Thermal Resistance Junction to Case		$R_{\theta JC}$	2	$^{\circ}C/W$
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^{\circ}C$

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	1.00	1.20
b	0.31	0.51
c	0.254 BSC	
D	5.15	5.55
D1	5.00	5.40
D2	3.92	4.32
E	5.95	6.35
E1	5.66	6.06
E2	3.52	3.92
e	1.27 BSC	
L	0.56	0.76
H	0.50 BSC	



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ELECTRICAL CHARACTERISTICS

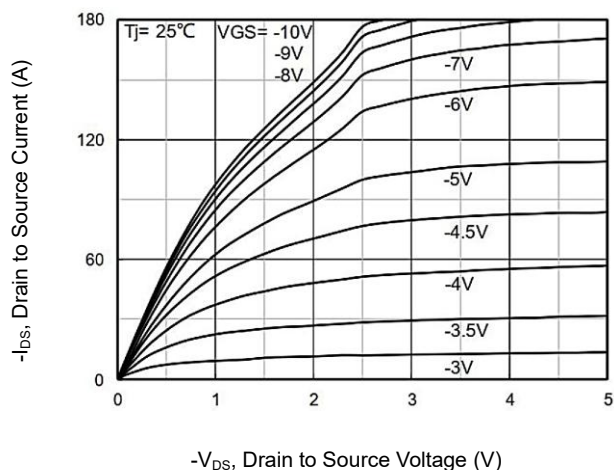
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	BV_{DSS}	-30	--	--	V
Drain-Source Leakage Current	$V_{DS}=-30V, V_{GS}=0V$	I_{DSS}	--	--	-1	μA
Gate-Source Leakage Current	$V_{GS}=\pm 25V, V_{DS}=0V$	I_{GSS}	--	--	± 100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-30A$	$R_{DS(ON)}$	--	8.2	10.5	m Ω
	$V_{GS}=-4.5V, I_D=-20A$		--	14	20	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	$V_{GS(th)}$	-1.2	-1.8	-2.8	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=-15V, V_{GS}=-10V, I_D=-20A$	Q_g	--	38	--	nC
Gate-Source Charge		Q_{gs}	--	6	--	
Gate-Drain Charge		Q_{gd}	--	10	--	
Turn-On Delay Time	$V_{DS}=-15V, V_{GS}=-10V, R_G=2.3\Omega, I_D=-20A$	$T_{d(on)}$	--	8	--	nS
Rise Time		T_r	--	6	--	
Turn-Off Delay Time		$T_{d(off)}$	--	108	--	
Fall Time		T_f	--	69	--	
Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, F=1MHz$	C_{iss}	--	1860	--	pF
Output Capacitance		C_{oss}	--	310	--	
Reverse Transfer Capacitance		C_{rss}	--	280	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	--	--	-55	A
Diode Forward Voltage	$V_{GS}=0V, I_S=-20A$	V_{SD}	--	--	-1.2	V
Reverse Recovery Time	$I_F=-20A, di/dt=-100A/\mu s$	T_{rr}	--	22	--	ns
Reverse Recovery Charge		Q_{rr}	--	43	--	nC

Note:

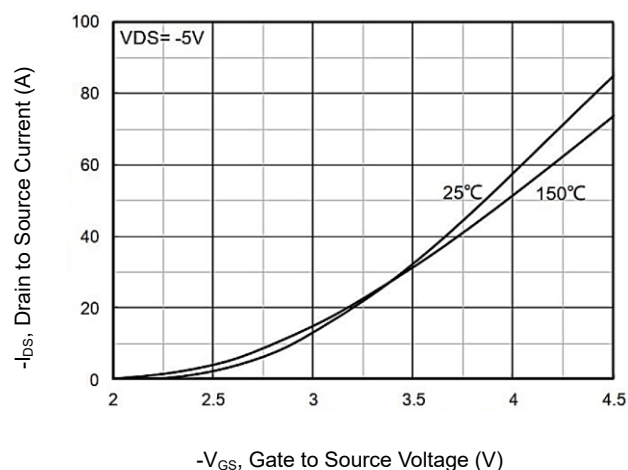
1. $T_A=25^\circ C$, unless otherwise noted
2. $T_J=25^\circ C$, unless otherwise noted
3. Repetitive rating; pulse width limited by max. junction temperature.
4. The E_{AS} test condition is $T_J=25^\circ C, V_{DD}=-25V, V_G=-10V, R_G=25\Omega, L=0.5mH, I_{AS}=-20A$.
5. P_d is based on max. junction temperature, using junction case and junction ambient thermal resistance.

CHARACTERISTIC CURVES

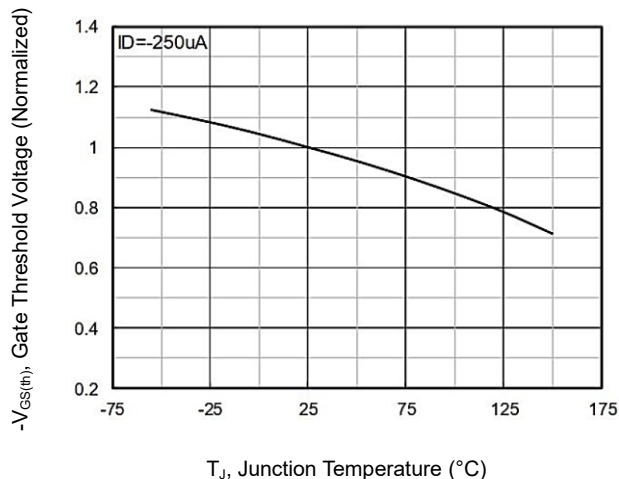
On-Region Characteristics



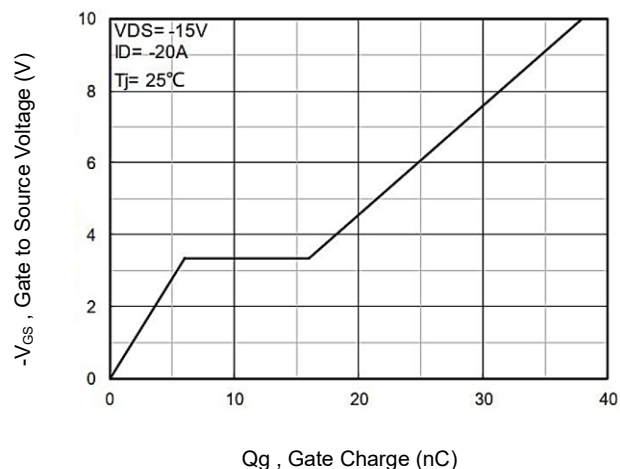
Transfer Characteristics



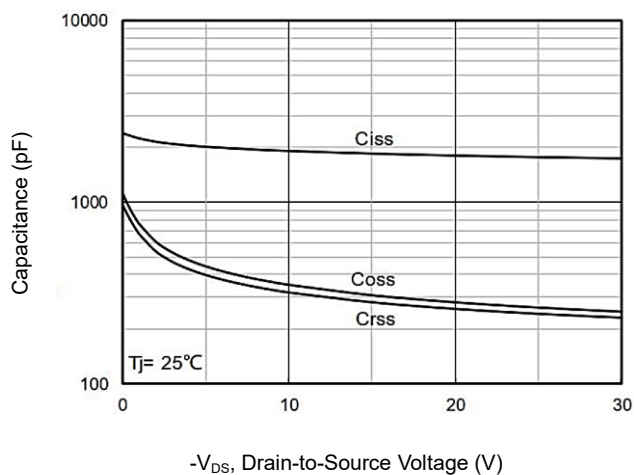
Gate Threshold Voltage vs Temperature



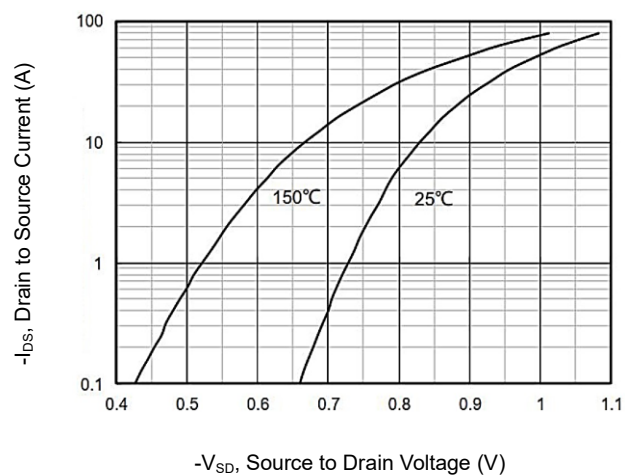
Gate Charge Waveform



Capacitance vs. Drain-Source Voltage

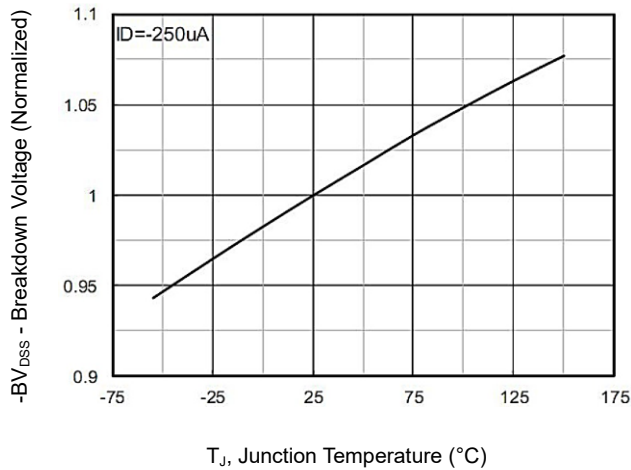


Body Diode Forward Voltage

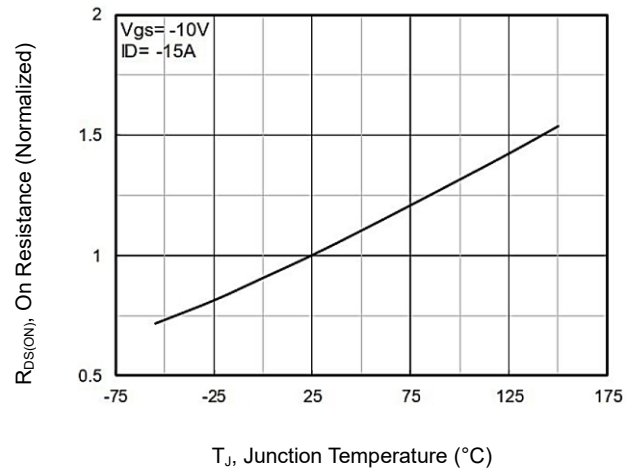


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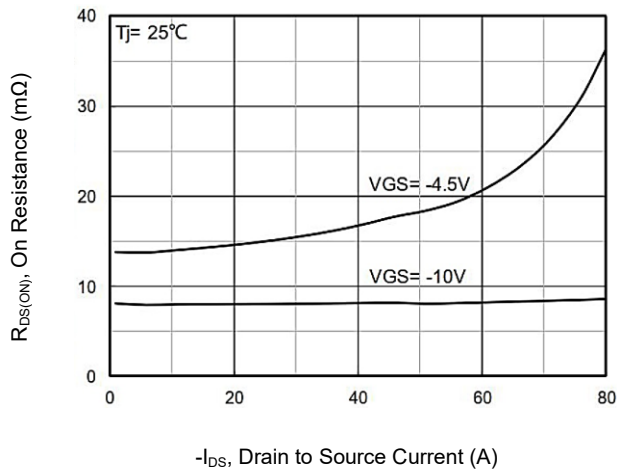
Breakdown Voltage vs Temperature



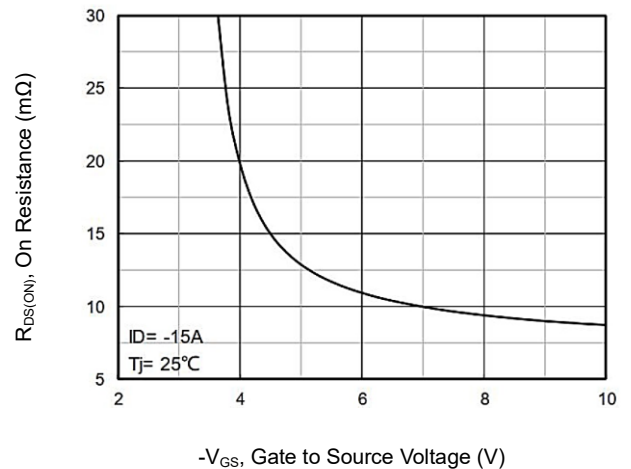
On-Resistance Variation with Temperature



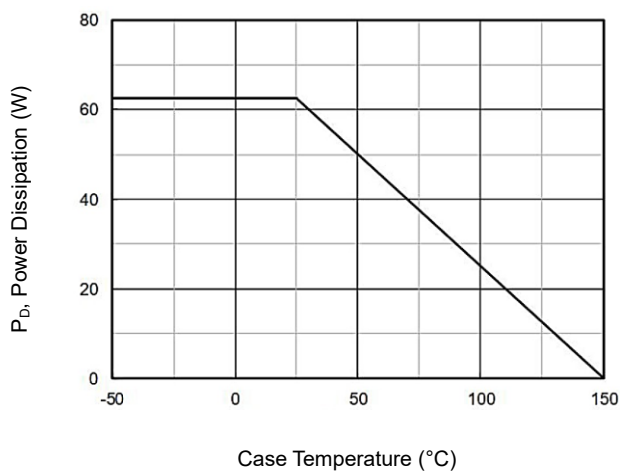
On-Resistance Variation with Drain Current



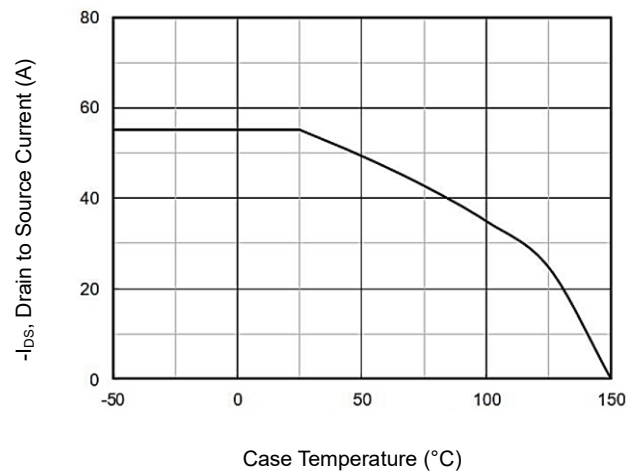
On-Resistance Variation with Gate-Source Voltage



Power Dissipation

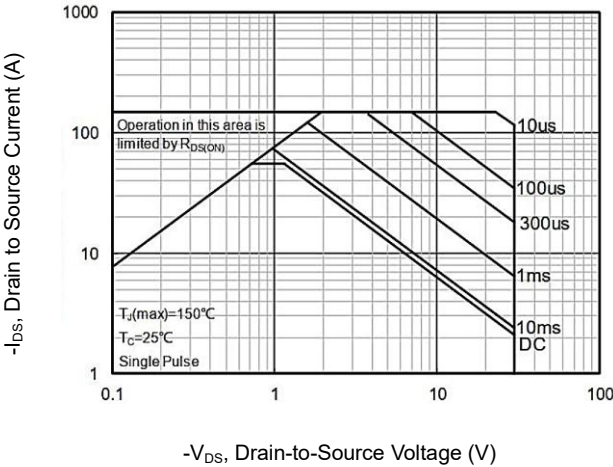


Current Dissipation

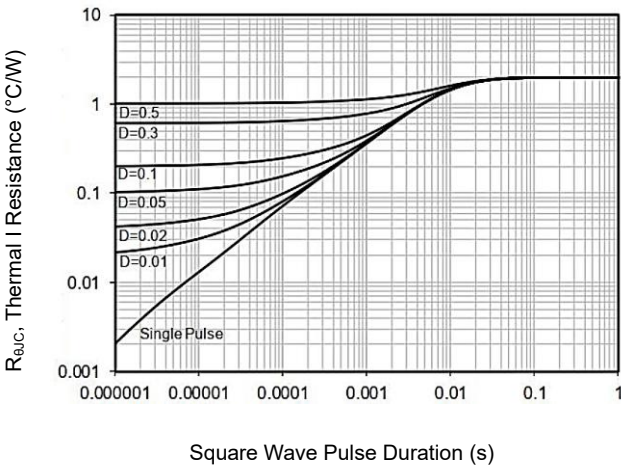


CHARACTERISTIC CURVES

Maximum Safe Operating Area



Transient Thermal Impedance



*Specifications subject to change without notice.